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IMPACT ASSESSMENT

Accompanying the document

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

establishing a European Maritime Single Window environment and repealing directive 2010/65/EU

{COM(2018) 278 final} - {SEC(2018) 230 final} - {SWD(2018) 182 final}

Contents

List of Annexes

Glossary

Term or acronym	Meaning or definition
Back-end entities	The authorities and IT systems receiving data via the National Single Windows
DEM	Data Exchange Mechanism
ECSA	European Community Shipowners' Association
EMSA	European Maritime Safety Agency
EMSWe	European Maritime Single Window Environment
ESPO	European Sea Ports Organisation
ENS	Entry Summary Declaration
EU	European Union
FAL	Convention on Facilitation of International Maritime Traffic
Front end users	The shipping operators providing data into the National Single Window in connection to a port call
ICT	Information and Communication Technologies
IMO	International Maritime Organisation
IPCSA	International Port Community Systems Association
ISC	Inter-Service Consultation
MOVE	Directorate General for Mobility and Transport
NSW	National Single Window
PCS	Port Community System - an electronic platform connecting the systems operated by the organisations and entities making up a seaport community. The Port Community System facilitates exchange of operational or administrative information between different actors in the port; it can also include systems for optimisation of processes (e.g. "smart port" systems). The PCS can be operated and maintained either by a public, private or public/private organisation.
RFD	Directive 2010/65/EU on Reporting Formalities for ships
Shipping operator	Subject to specific reporting requirements set in the EU legal acts and international agreements, the operator may be a shipping company, a ship master or the representative of the shipping company/ship master
SSN	SafeSeaNet
SSS	Short Sea Shipping
VTMIS	Vessel Traffic and Monitoring Information System
WCO	World Customs Organisation

1. INTRODUCTION: POLITICAL AND LEGAL CONTEXT

Maritime transport operators face a wide range of reporting obligations every time a ship calls a port. Since the adoption of the Reporting Formalities Directive (RFD)[1] in 2010 within the context of the *European maritime transport space without barriers*[2], some of this reporting is channelled via *National Single Windows*. The purpose of the RFD was to harmonise and simplify the administrative procedures for shipping operators, thus improving the efficiency and competitiveness of intra-EU maritime transport. The National Single Windows should give shipping operators the benefit of simplified reporting, more efficient clearance and thereby shorter release times for faster turnaround in ports.

An evaluation of the RFD performed as part of the fitness check of the EU maritime transport policy in 2016-2017[3], found that these objectives have not been reached, although they remain highly relevant. Ultimately, the current RFD has been found ineffective: it does not provide the tools, incentives or requirements to achieve EU-wide harmonisation of reporting. The voluntary nature of the measures has also proven insufficient. Further, the provisions of the RFD are too vague to be supportive of improvements, as it does not have mechanisms for updating the framework to address these shortcomings in either delegated or implementing procedures. The problem analysis has been confirmed in consultations with the shipping industry and Member States. This impact assessment therefore assesses several options for improving the situation and for creating a more effective and efficient reporting environment to facilitate maritime transport and trade.

1.1. Background: the Reporting Formalities Directive

The RFD was intended as a tool to establish a simplified reporting environment for ships by asking Member States to provide a single reporting entry point for a number of reporting formalities for ships.

The RFD did not introduce any new reporting obligations for shipping but aimed at reducing administrative burden deriving from EU legal acts or from international legislation:

- by simplifying and rationalising information requirements set in different legal acts;

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[1] Directive 2010/65/EU on reporting formalities for ships arriving in and/or departing from ports of the Member States (RFD), 20 October 2010, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32010L0065; Replacing at that time Directive 2002/6/EC

[2] European Commission, *Communication and action plan with a view to establishing a European maritime transport space without barriers*, 21 January 2009, COM(2009)10 final, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2009:0010:FIN

[3] European Commission Staff Working Document: *Evaluation of Directive 2010/65/EU on reporting formalities for ships arriving in and/or departing from ports of the Member States*, 2018 (referred to hereafter as *Evaluation of the RFD*)

- by replacing paper submissions with harmonised digital submissions; and
- by harmonising reporting on national level and establishing a single entry point for multiple formalities, the National Single Windows.

The RFD is not concerned with the processing or content of the reported data; only with streamlined reporting procedures and formats for the data requested from ships by the underlying legal acts[4]. The data sets under the RFD scope are defined by the basic acts referred to in the RFD annex.

The National Single Windows could be organised in different ways: e.g. centrally in the Member State or in a distributed system of National Single Window entry points. The National Single Windows channel the data submitted by the data providers (shipping operators) to the back-end data recipients (connected authorities and systems requiring these formalities). The National Single Windows thus perform two bundles of functionality: a) **data collection** from data providers, i.e. the functionality associated with receiving and validating the reported data set and sending back responses (reporting gateway); and b) **data distribution** to the authorities, i.e. the functionality associated with rearranging the information into specific data sets, sending them to the relevant authorities, and taking care of any related message exchanges.

The RFD states that the same information (static data or data already reported and unchanged) should have to be reported by the shipping operator only once. The RFD also calls for coordinated and harmonised reporting at EU-level[5]. The deadline for Member States to apply the new reporting regime was 1 June 2015[6]. Among the main achievements of the RFD are the largely completed digitalisation of reporting and the connection of a number of data recipient authorities to the National Single Windows, creating a shared national entry point for certain ship reporting.

However, the current RFD does not provide any binding specifications for the interfaces, data formats or reporting procedures for the National Single Windows. The consequence is that each Member State has developed a unique technical interface for reporting. There is no harmonised front-end (reporting interface/entry point) towards the shipping operators. In addition, much reporting is still requested via other channels. This is further discussed in the *Problem description* below.

More information about the current ship reporting environment is found in Annex 5.

[4] EU and international legislation referred to in RFD Annex
[5] RFD, Article 3.2
[6] RFD, Article 5.1

1.2. Legal context

Maritime transport is subject to complex administrative procedures even if vessels sail only between EU ports (intra-EU maritime transport) and the cargo consists only of goods in free circulation ("Union goods"). These procedures involve a wide set of international and EU legislation on transport safety and security, environment protection, customs, veterinary and plant-protection, and national and local formalities for vessels arriving in or departing from ports.

The RFD complements other EU legislation by providing a tool for streamlined reporting from shipping operators to data recipients (authorities). The directive covers a set of 14 digitalised reporting formalities resulting from international agreements and EU legal acts on vessel traffic and monitoring information and on transport of dangerous goods[7], on registration of persons sailing on board passenger ships[8], on the Schengen Border Code[9], on management of waste and cargo residues[10], on ship and port security[11], and on the Union Customs Code[12].

The RFD also builds on the international level legislation and notably the International Maritime Organisation (IMO) framework for international ship reporting formalities. The IMO FAL Convention[13] sets out some internationally agreed reporting formalities for ships. The RFD provides the European framework for electronic reporting according to these standards. The IMO however does not establish standards for all ship reporting formalities, nor does the international framework provide any guidance for simplified, digital reporting procedures and interfaces.

1.3. Policy context

The RFD is part of the EU maritime transport policy, contributing to the overall Commission transport policy goal of completing the internal market for transport by removing remaining

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[7] Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 establishing a Community vessel traffic monitoring and information system (OJ L 208, 5.8.2002, p. 10)

[8] Council Directive 98/41/EC of 18 June 1998 on the registration of persons sailing on board passenger ships operating to or from ports of the Member States of the Community

[9] Regulation (EC) No 562/2006 of the European Parliament and of the Council of 15 March 2006 establishing a Community Code on the rules governing the movement of persons across borders (Schengen Borders Code) (OJ L 105, 13.4.2006, p. 1)

[10] Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues (OJ L 332, 28.12.2000, p. 81)

[11] Regulation (EC) No 725/2004 of the European Parliament and of the Council of 31 March 2004 on enhancing ship and port facility security (OJ L 129, 29.4.2004, p. 6)

[12] Regulation (EU) No 952/2013 of 9 October 2013 laying down the Union Customs Code (OJ L 269, 10. 10. 2013) (only part of customs formalities currently covered by the RFD scope)

[13] International Maritime Organisation, *Convention on Facilitation of International Maritime Traffic* (FAL), adopted 9 April 1965

bottlenecks, barriers and administrative burden[14]. It supports the Commission priorities of *a deeper and fairer internal market* and the *digital single market* and indirectly contributes to the priority of *jobs, growth and investments*.

The objectives of the *European maritime transport space without barrier[15],* of harmonising and simplifying administrative procedures remain highly relevant for EU policy. This was confirmed by the European Council in its Valletta declaration on the EU's maritime policy[16] and its conclusions on 8 June 2017[17] on the priorities for the EU's maritime transport policy until 2020, both underlining the need to reduce administrative burden for maritime transport by ensuring simplified and digitalised reporting procedures for ships and inviting the Commission to introduce measures for EU-level harmonisation of the reporting environment. The Council repeated this request again in its conclusions on digitalisation of transport on 8 December, 2017[18].

The industry and maritime transport stakeholders also support the need to reduce the administrative burden through harmonisation. In a joint statement on 1 March 2017[19], ten EU industry associations called for a "a true European single window environment for maritime carriers that fully ensures the 'reporting once' principle and which shares all necessary cargo and conveyance data between governments and all relevant authorities". More recent statements e.g. by the European Community Shipowners' Association have echoed this same position[20]. A submission to the REFIT platform was done by Finland, as a survey amongst Finnish public administration, business and stakeholders identified the RFD as an example of EU legislation raising particular concerns.[21]The proposal for a revised legal framework for reporting formalities is part of the Commission's third mobility package, together with, among others, a proposal for a regulation on electronic freight transport information. These

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[14] European Commission, *White paper: Roadmap to a Single European Transport Area*, COM(2011) 144 final, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0144&from=EN

[15] *Communication and action plan with a view to establishing a European maritime transport space without barriers*, COM(2009)10 final

[16] Valletta Declaration: *Priorities for the EU's Maritime Transport Policy until 2020: Competitiveness, Decarbonisation, Digitalisation to ensure global connectivity, and efficient internal market and a world-class maritime cluster*, Valletta, 29 March 2017, https://www.eu2017.mt/en/Documents/Valletta_Declaration_on_the_EU_maritime_transport_policy.pdf

[17] Council conclusions on *Priorities for the EU's maritime transport policy until 2020: Competitiveness, Decarbonisation, Digitalisation to ensure global connectivity, an efficient internal market and a world-class maritime cluster*, adopted by the Council at its 3545th meeting held on 8 June 2017, http://data.consilium.europa.eu/doc/document/ST-9976-2017-INIT/en/pdf

[18] Council conclusions *on the digitalisation of transport*, adopted by the Council at its 3581st meeting held on 5 December 2017 http://data.consilium.europa.eu/doc/document/ST-15431-2017-INIT/en/pdf

[19] *Joint industry statement*, 1 March 2017, https://www.europeanshippingweek.com/joint-industry-statement-clia-europe-eba-ecasba-ecsa-empa-eta-etf-euda-interferry-wsc/

[20] European Community Shipowners' Association, Newsletter 22 December 2017: *A single market for shipping – time to make it happen*, http://www.ecsa.eu/news/single-market-shipping-time-make-it-happen

[21] https://ec.europa.eu/info/sites/info/files/mobility_and_transport_1.pdf

two initiatives share the same main objective, which is to facilitate the communication of regulatory information to authorities in electronic format, but differ in various respects. Such differences and similarities are further outlined below.

The information concerned by the two initiatives has its source in different international, EU and Member States legal acts. These legal acts do not overlap between the two initiatives and the information sets are different. For example, the information required for fulfilling maritime reporting formalities includes cargo description, alongside a wide range of other information elements on the ship, its crew and passengers. The information requirements under the scope of the initiative on electronic freight transport information, while also containing elements of cargo description, are focused primarily on the transport operation itself – on the identity of the consignor, carrier and consignee, places of pick-up and delivery, route and several others. However, the two initiatives will ensure the interoperability of the electronic data concerned, concretely, by prescribing the same data model and syntax for the common data elements.

Geographically, the scope of the electronic transport document initiative begins where the maritime reporting environment initiative ends. The initiative on electronic freight transport information concerns the transport of goods within the EU once these have been cleared for entry in the Union, following the process of maritime and customs reporting formalities. The proposal on freight transport information will allow the use of electronic documentation not just at the point of entry and exit of the EU – where it is already mandatory – but also in the following (or preceding, in case of export) phase of inland transport. Together, they will ensure appropriate coverage of information, for the entire travelling span of whatever the freight concerned.

In terms of technical solutions envisaged, the two initiatives require however a different approach. This is because in the case of reporting formalities in ports, information must be submitted at a specific point in time to a pre-defined set of authorities; in the other case (electronic freight transport documents), information only needs to be available in case it is required for inspection. The two initiatives are therefore complementary and mutually reinforcing.

The proposal for a revised legal framework for reporting formalities follows on the Fitness check of the Maritime Transport Policy initiated in 2016 under the Commission REFIT programme, which found the RFD framework inefficient and ineffective. The new proposal will be aligned with and supportive of the implementation of the Union Customs Code and its connected customs IT systems.

More details on connected policy areas is found in Annex 7

1.4. Economic and trade context

Maritime transport is a backbone of trade and communications within and beyond the single market. Almost one third of all intra-EU and three quarters of the internationally traded goods (in tonnes) are seaborne. In terms of value, about half of EU international trade in goods is transported by sea.

The number of port calls by passenger or freight vessels in main EU-28 ports in 2016 was estimated at almost 2.1 million. Each year, around 400 million passengers embark and disembark at EU ports. Sea transport turnover was EUR 106 billion in total for EU28 in 2014.[22]

There are around 11 000 maritime transport enterprises in the EU28 and around 178 000 people directly employed in the maritime transport sector[23], with another 1.5 million jobs in EU ports[24], indirectly linked to the sea-borne trade and transport.

Furthermore, the smooth functioning of port calls is one link in a longer transport chain. Ports are not the final destination of goods. The efficiency of the ship port calls, as affected e.g. by the efficiency of the reporting environment, will impact on the entire logistics chain and the hinterland transports of goods and passengers to and from the ports, notably by rail, road, inland waterways or pipelines.

More details on the economic context can be found in Annex 8.

2. PROBLEM DEFINITION

2.1. What is the problem?

This initiative addresses the problem of the current inefficient port call reporting environment for maritime transport operators (legal reporting requirements for when a ship is to arrive in or depart from a port – a *port call*).

Vessels in international traffic (generally larger vessels, shipping around 63% of all transported goods and 6% of the passengers going into or out of EU ports[25]) are subject to both customs and maritime transport formalities. They need to submit a series of declarations and notifications at different points in time, starting with the Entry Summary Declaration (ENS) with cargo-related information, normally submitted even before departure from the third country port. Approaching the port call, they must also submit information and data relating to border controls, environmental controls, safety/security and traffic management. Some of these data elements are requested following legal requirements in EU or international law, other reporting is requested based on national legislation. Via the port reporting the ships may also arrange various port services such as pilotage and logistics for goods management (reporting not based on legislative requirements).

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[22] European Commission, *Statistical pocketbook 2017: EU transport in figures*, https://ec.europa.eu/transport/facts-fundings/statistics/pocketbook-2017_en

[23] Statistical pocketbook 2017: EU transport in figures

[24] https://ec.europa.eu/transport/modes/maritime/ports/ports_en

[25] Eurostat, *Maritime ports freight and passenger statistics*, January 2017

Vessels in intra-EU traffic ship around 25% of all goods and 33% of the passengers to or from EU ports. They too may have to complete customs formalities: if they have left EU territorial waters (twelve nautical miles from the coast), if they carry non-EU goods or if they sail under a non-EU flag. They must also complete most of the maritime transport reporting formalities required for the international traffic vessels as described above, with possible exemptions from e.g. border controls within the Schengen zone.

For vessels in national traffic (shipping 9% of the transported goods and 57% of all passengers to or from EU ports) there are normally less customs formalities applying, unless the vessel meets one of the criteria mentioned above (non-EU flag, departing from EU territorial waters or carrying non-EU goods). The border control reporting normally does not apply. Other maritime transport reporting formalities and port service information submissions must usually be completed.

Some of the underlying legal acts to the RFD also have exemptions for vessels depending on their size, e.g. the Vessel Traffic Monitoring and Information System which does not apply to ships of less than 300 gross tonnage. There are also exemptions and simplifications for some vessels in regular services calling exclusively in intra-EU and/or national ports (e.g. ferries, cargo or cruise ships operating on a fixed route).

The current RFD makes it mandatory for Member States to request the maritime reporting based on certain EU and international legislation via the National Single Windows. The national reporting requirements *may* also be channelled via the National Single Window while the large majority of customs formalities are done via separate IT systems.

Some shipping companies prefer to do their port call reporting via automated machine-to-machine reporting if available in the port they call. This is especially common among the large shipping operators. Other shipping companies prefer reporting via graphic user interfaces and uploading information using spreadsheet files, if available in the port they call. Many companies also use ship agents to deal with the reporting formalities and/or cargo agents to deal with the customs formalities.

The use of ship and/or cargo agents is often needed because of the diverging reporting systems in each Member State and in some cases in each port.

The current legislative framework was evaluated in 2017[26]. The evaluation concluded that the RFD is inadequately effective and efficient, in spite of the objectives remaining highly relevant and valid. The evaluation concluded that there is potential for further simplification and burden reduction in this area. This is also the strong messages repeatedly sent by stakeholders, calling for measures to urgently address the situation.

[26] Part of the Fitness check of the Maritime Transport Policy (initiative under the Commission Work Programme (REFIT) for 2016)

The main barrier emphasised by the shipping operators and stressed in the evaluation, is the lack of harmonisation of the maritime National Single Windows and the overall lack of EU-level harmonisation of all reporting required by a carrier calling a port[27]. Today, each National Single Window looks different. Data formats are different, reporting procedures are different and the scope of reporting through each National Single Window differs. Some Member States accept machine-to-machine reporting, others provide graphic user interface and accepts uploading of spreadsheets (or receives spreadsheets per e-mail). Some Member States allow reporting via port community systems into the National Single Windows or have delegated National Single Window functions to each port (decentralised system). The shipping operators thus have to adjust their reporting and their IT software and data sets for each Member State – or even for every individual port they call.

The non-harmonised reporting environment makes reporting a very burdensome and time-consuming task for shipping operators. Indeed, the current legal act provides no guidance or binding specifications to guarantee the development of common data models, front-end interface or reporting procedures for shipping operators.

The consequence is an unnecessary high administrative burden on shipping operators. The majority of the shipping companies replying to the open public consultation on the evaluation considered that administrative burden was reduced either not at all (61% of all shipping companies and ship-owners' associations) or only to a limited extent by the adoption of the RFD. According to more than half of all responding shipping operators, the burden has in fact increased rather than decreased[28], as an effect of the old reporting requests via separate entry points often remaining in place in parallel to the new National Single Windows.

For the national authorities and port operators, this is not a major problem. From the view of an individual port, the information exchange with ships is normally perceived as smoothly functioning. From the side of shipping companies and maritime transport operators however, as they call to different ports, the multitude of different and sometimes duplicating/overlapping reporting requests becomes a burden. This is the message repeatedly sent from shipping companies and their EU-level associations.

Every year, more than 2 million port calls are made in the EU. For these port calls, the maritime transport operators are obliged to submit a large set of information. The evaluation found that on average, the time spent on reporting for one single port call ranges between one and three hours. This translates into around 4.6 million staff hours spent on reporting per year for all EU port calls. The large majority (90%) of all stakeholders consulted for the evaluation

[27] There is however EU-level harmonisation of *data requirements within respective sectors*, e.g. the harmonised customs data requirements following the implementation of the Union Customs Code legislative package, Regulation (EU) No 952/2013 of 9 October 2013 laying down the Union Customs Code (OJ L 269, 10. 10. 2013).

[28] 55% of shipping company respondents: *Evaluation of the RFD*

and the impact assessment consider that this time spent on reporting could be substantially further reduced by harmonisation and simplification of the reporting environment.

As a consequence of the unnecessary administrative burden facing the shipping operators, maritime transport is less competitive than other transport modes. Moreover, the attractiveness of the profession is reduced and has been reported as an important cause for employee dissatisfaction in the sector[29]. The lack of harmonisation of maritime transport reporting creates an obstacle to an efficient and optimised movement of ships and cargo and thereby hampers the smooth functioning of the internal market. In the wider perspective, this mismatch of administrative proceedings and their low efficiency affects the whole EU logistic chain, beyond maritime transport (multimodal transport links; rail, road and inland waterway), since the overly burdensome administration of reporting results in less efficient logistic planning and increased lag time in ports.

The issue is of relevance primarily for the maritime Member States[30] and their authorities linked to the maritime National Single Windows; for the maritime transport operators; and for all stakeholders involved in and around port operations and port management. The problems impact in first hand on the maritime transport sector and the shipping operators. See also detailed table in Annex 6.

2.2. What are the problem drivers?

The evaluation identified the following drivers:

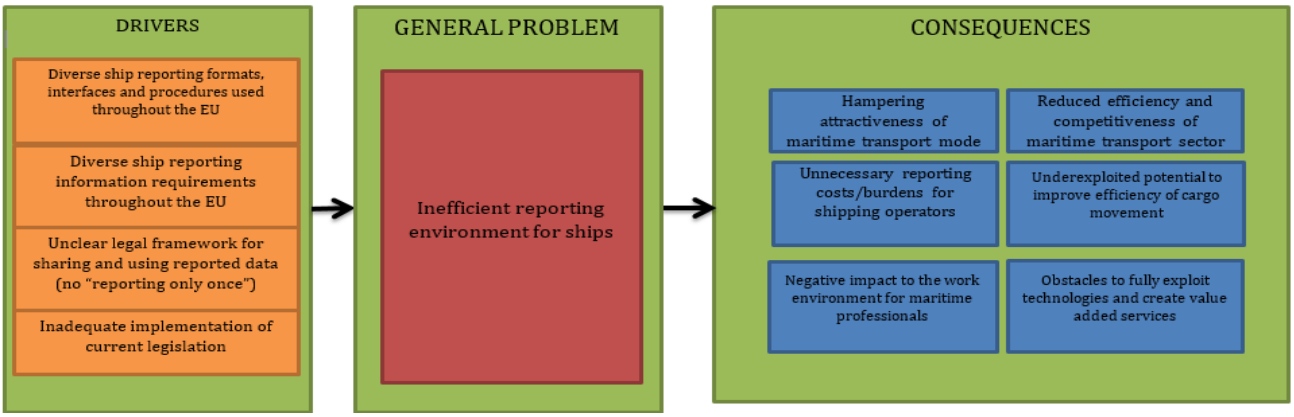

Figure 1: Problem tree

P1. Diverse ship reporting formats, interfaces and procedures used throughout the EU

[29] Targeted consultations for the Impact Assessment

[30] Austria, Czech Republic, Hungary, Luxembourg and Slovakia as non-maritime states are not directly affected by the directive.

The RFD did not introduce binding technical specifications for electronic interfaces, but left the implementation of the National Single Windows to Member States. According to the Directive, the Commission should develop mechanisms for the harmonisation and coordination of reporting formalities within the Union, together with the Member States[31]. This was done: an expert group on maritime administrative simplification and electronic information services (the eMS group[32]) developed some definitions, business rules and guidelines[33] and a standard data set[34] in 2015. The European Maritime Safety Agency (EMSA) also developed a prototype of a National Single Window and the results are transparently shared and made available, including user manuals and templates. These guidelines and support activities have however not proved very effective. They are not binding, nor very detailed; the guidelines have not hindered fragmented implementation of different National Single Window set-ups at Member State level. Furthermore, the RFD has no mechanisms to continuously develop and improve provisions for harmonisation and no tools for update of the legal framework in step with technical or political developments (e.g. a governance system, delegated/implementing acts[35]).

The absence of binding common standards has led to the introduction of reporting interfaces which are technically different for practically each port call[36]. Data sets and reporting formats differ, sometimes even within a Member State. Data models and interfaces are not aligned even between Member States who participated in coordination projects such as AnNa[37]. The European shipping industry association ECSA concludes on the reporting formats encountered by their members: "These are not only complex and repetitive, but even worse, they are completely unharmonised throughout the EU".[38] The non-harmonisation is especially burdensome for vessels calling into several EU ports (as compared to vessels in national traffic or going in liner traffic between the same two ports – although those vessels are also affected by inefficiencies and duplication of reporting beyond the non-harmonisation issue). The non-harmonisation is in particular an issue for vessels in tramp/non-fixed routes traffic, calling always into different ports. Tramp traffic vessels make up around 60% of all port calls, with around 40% of all port calls being by vessels in liner traffic.

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[31] RFD, Article 3:2
[32] http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=2593
[33] *National Single Window Guidelines*, 17 April 2015, https://ec.europa.eu/transport/sites/transport/files/modes/maritime/doc/2015-06-11-nswguidelines-final.pdf
[34] *eMS Data Mapping Report*, 25 February 2015, https://ec.europa.eu/transport/sites/transport/files/data_mapping_report_2010_65_eu_0.pdf
[35] RFD, Article 10: possibility only to adopt delegated acts for the update of the Annex related to the FAL forms under IMO.
[36] *Evaluation of the RFD*, p.16
[37] http://www.annamsw.eu/about.html
[38] European Community Shipowners' Association: *A single market for shipping – time to make it happen*

Furthermore, there are many different channels or interfaces with which the maritime operators need to adapt their systems in order to provide all information required for a port call. For one port call, they might have to send data through National Single Windows in XML, through a port community system in EDIFACT and use a third format or data model for national customs system. This creates an expensive technical environment to maintain. This is not a matter of harmonisation of data formats; with the introduction of the new Union Customs Code legislative package, customs reporting formalities have already undergone a process of harmonisation at EU level. However, since the harmonised customs formalities are requested in a separate reporting channel from the maritime reporting formalities, shipping operators state that the total time spent on reporting for them is affected negatively (see further information below in chapter on impacts of options).

The existence of several additional reporting entry points in parallel to the National Single Window limits the actual harmonisation of reporting. It reduces the added value of the National Single Window for the industry, who is faced with multiple reporting channels simultaneously.

The situation of non-harmonisation is highly unlikely to be solved only by full implementation of the current Directive. The RFD lacks the instruments for achieving harmonisation: crucially, it lacks the possibility of adopting binding specifications. When asked in the consultations, no single Member State replied that they intend to change current systems towards harmonisation on the basis of the voluntary guidelines.

In such context, full compliance of Member States with the requirements of the existing Directive might consolidate a situation of nationally harmonised but EU differentiated reporting systems, which might render even more difficult a further evolution towards a single EU approach, as demanded by the industry.

P2. Diverse ship reporting requirements throughout the EU

Currently, the RFD reporting rules only concern some of the formalities envisaged by EU legislation and international maritime agreements. National requirements are only reported via the National Single Window on voluntary basis while some EU formalities, e.g. related to customs aspects, are only partially included. Currently, some 230 data elements fall under the 14 formalities for mandatory RFD reporting (RFD Annex 1, part A: EU legislation and B: international obligations). This includes the core maritime transport reporting elements for e.g. safety, security, traffic management, border controls and waste control (environmental objectives), as well as the seven standardised IMO forms[39] relating to e.g. dangerous goods, crew and passenger lists and the general and cargo declarations. The data reported via the

[39] The so called "FAL forms", http://www.imo.org/en/OurWork/Facilitation/FormsCertificates/Pages/Default.aspx

National Single Windows thus serve several purposes and covers a broad spectrum of policy areas.

However, in addition to these EU and international reporting obligations, ships are obliged to send many additional information elements when calling a port. A large part of the reporting burden comes from the non-harmonised national reporting requirements that are not mandatorily channelled via the National Single Windows. These requirements also differ from Member State to Member State. A Member State sub-group[40], together with the Commission services, is currently mapping the additional data elements derived from national legislation (RFD Annex 1, part C), estimated to make up at least 200 additional data elements. Moreover, maritime operators must provide transport-related information required for statistical purposes[41].

In addition, data related to the ships' cargo are required, primarily by customs authorities but also by maritime transport authorities. This data has recently been mapped by the so called eManifest pilot project. The project has identified a cargo data set of another 150 data elements possibly required for the fulfilment of customs formalities[42] related to the arrival/departure of a ship from/to an EU port[43]. The list of customs formalities/functionalities requiring this information includes: Entry Summary Declaration, Arrival Notification, Presentation Notification, Declaration for Temporary Storage, Customs Goods Manifest, Electronic Transport Document for simplified transit, Re-Export Notification, Export Summary Declaration, and Exit Notification for Export. These customs formalities are currently not channelled via the National Single Windows but mainly through customs IT systems (national or upcoming EU-level systems). Customs authorities are currently establishing a harmonised data set under the implementation of the Union Customs Code[44] and an EU-level single access point (the ICS2 shared trader interface for the Entry Summary Declaration) is being developed.

All data elements listed above have already been mapped out by the Commission in cooperation with EMSA and Member States in a single data set, providing an overview of all data that may be requested from ships in EU port under the current RFD scope and beyond.

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[40] "Correspondence group on Part C data" under the Single Window subgroup to the High-level Steering Group for Governance of the Digital Maritime System and Services

[41] Directive 2009/42/EC

[42] The exact number of data elements required will depend on the formalities the ship has to fulfil which in turn depends on the previous port and on the nature of goods (union or non-union).

[43] Reported by the carrier or other persons identified by the Union Customs Code as responsible for completion of customs formalities It should be noted that the cargo-related data elements must be reported for each consignment/item and could thus amount to a huge reporting load, especially for container ships and general cargo ships with a multitude of different consignments on-board.

[44] Customs formalities are harmonised via the implementation of the Union Customs Code legislative package.

Finally, another aspect which presents a smaller problem: today, paper copies of a set of at least 100 ship certificates such as *Certificate of Registry* and *Certificate of Class* are kept on-board ships to provide proof that the vessels are compliant with various regulations and conventions. The management and keeping of paper certificates is often seen as an administrative burden and an area where digitalisation could bring further benefits. Paper certificates are also exposed to forgery and fraud which could be avoided with digitalisation, provided that relevant cyber-security measures are introduced.

Bringing in a more comprehensive data set into the coordinated and harmonised reporting environment would require changes to the RFD. The current legal framework does not have the update mechanisms to allow a broadening of the data set.

More detailed information on the data elements within and beyond the current scope of RFD can be found in Annex 5.

P3. Unclear legal framework for sharing and using reporting information

Today, data flows are suboptimal and duplicate reporting takes place because of lack of data sharing between authorities.

The data provider – e.g. the carrier or the agent appointed as their representative for these purposes – today submits through the National Single Windows a set of data including both static and dynamic data. The static data can be broken down into two subcategories: permanent static and temporarily static data elements. Information which does not commonly change (identification and particulars such as tonnage) is considered permanent static. The information which does not usually change between the departure and arrival ports, such as crew and passenger lists, or hazardous cargo information, is considered temporarily static information. The dynamic information, such as waste on board, cargo or estimated arrival time, is the one that changes regularly.

There are two main aspects of reporting the same data only once. First, there is the issue of the same data often being requested several times within the same port call. Respondents in the consultations (in particular shipping companies and ship agents) stressed that multiple reporting is a fact. In some ports (28% of respondents even claim: in most ports), maritime operators are required to report *the same information* (static and dynamic) separately to different authorities when calling a port.[45] Sometimes the reason is vertical silos: the authorities act independently without coordination. Sometimes there is a horizontal issue where central authorities fail to share data with local ones. This means that many Member States and ports still have an inefficient data sharing environment where reported data is not sufficiently channelled to all relevant data recipients. Reporting only once within the same port supports efficiency of reporting but also to some extent contributes to burden reduction

[45] *Evaluation of the RFD*, p.36

for the shipping operator by minimising duplication of work, as described in the Commission *Study on eGovernment and the Reduction of Administrative Burden* by EY and DTI from 2014[46]. The reporting-only-once was an objective mentioned already in the current RFD but not achieved; the poor implementation of the current provisions is at least partly a result of unclear Directive provisions providing insufficient instructions.

The second aspect is the "reporting only once" enabling the re-use of static data from one port call to another (also not sufficiently addressed in the current RFD). This is not taking place at all today, except in a few pilot project cases of exchange services between ports with connected systems. These pilot projects show that the re-use of unchanged data would in principle be possible, assuming that data protection and data quality rules are respected throughout the data exchange chain[47][48]. Lack of re-use of data between ports is a missed opportunity for simplified reporting for shipping operators (e.g. enabling pre-filled forms or transforming the departure form from one port into the arrival form for next port). This especially makes some difference for smaller shipping operators reporting manually (via graphic user interface) where any duplication in reporting obligations means some time lost. It also increases the complexity of port calls for ships with small crews. In the consultations, 81% of all respondents expect to have some or high benefits from data re-use, with highest focus on the need for data re-use among shipping operators and ship agents.

However, the reporting only once between ports is also about missed opportunities for the wider chain of transport logistics. The current lack of data sharing between ports (within and beyond a Member State) means that business potential for more efficient procedures for ports and for authorities is untapped. Access to this information would in many cases be quicker for these stakeholders by way of interconnecting the existing reporting systems rather than only requiring all updates directly from the vessels.

It should also be noted that some information reported to the National Single Windows today is already exchanged between the Member States through SafeSeaNet[49]. However, the Member States have reported that they do not use this data for reduction of reporting duplications by ships, in spite of the possibility offered in the RFD[50].

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[46] https://ec.europa.eu/digital-single-market/en/news/final-report-study-egovernment-and-reduction-administrative-burden-smart-20120061

[47] See for example the IPCSA *Network of Trusted Networks project with web service for exchange of port to port exchange of data.*

[48] See also "The Once Only Principle" (TOOP) project within the EU *eGovernment Action Plan 2016-2020*. The aim of TOOP is to ensure that information can be supplied to public administrations only once regardless of the company's country of origin. This principle is promoted to eliminate unnecessary burdens for European businesses by avoiding that they are asked to present the same data and documents repeatedly.

[49] RFD: Article 6

[50] RFD: Article 9

Re-use and efficient sharing of data within the context of the RFD is today hampered primarily by unclear or missing specifications on data definitions and use/re-use. Authorities' obligation to share data, even for the same port call, is not clearly enough specified. The vague provisions of the RFD have therefore not supported the objective of moving towards the "reporting only once"; this is a clear shortcoming of the current Directive.

Furthermore, recipients of cargo or ship information are reluctant to share data since the legal framework – as regards aspects of data control, confidentiality, liability and access rights – is perceived as unclear. The current RFD does not provide sufficient specifications and support on this. For example, concerns regarding the interpretation of the General Data Protection Regulation have been voiced in several of the consultation events[51], with data recipients uncertain about how to deal with potentially sensitive personal data elements such as passenger lists or crew personal data. Clear rules for accessing data are also missing, according to consulted stakeholders[52].

This has an impact also on the information which is commonly considered as open data, such as departure and arrival times which could be of value for efficiency gains throughout the multimodal transport chain. There is today no uniform application on how this data should be treated. Some Member States make it public but only locally through port information boards, other share it via Internet. The inconsistent approaches reduce the possibility of using this data for multimodal transport management.

These issues would not be solved by full implementation of the current Directive; the RFD does not provide sufficiently clear provisions to achieve these objectives on its own and in its current form.

P4. Inadequate implementation of current legislation

The unspecific definitions and provisions of the Directive have in turn also hampered implementation and enforcement of the directive. The slow implementation of the RFD is not the core problem for shipping operators (and full implementation would not solve problem drivers 1-3, as described above), although it does contribute to the complexity of the reporting environment.

It is telling that operational National Single Windows are still under implementation in eight of the 23 maritime Member States. In addition, even where there are National Single Windows implemented, there are not always national procedures, national technical standards, or an actual single entry point for reporting. A likely reason for the diverse interpretations of

[51] E.g. *Report from consultation event with the HLSG expert sub-group meeting on Single Window,* Brussels, 26th October 2017; Consultation synopsis report, Annex 2

[52] Consultation workshop: *Moving towards a European Maritime Single Window environment – what road to take?* Digital Transport Days, Tallinn, 8 November 2017; Consultation synopsis report, Annex 2

the current RFD is that the provisions are extremely vague, giving very little guidance or direction to Member States, who could reasonably claim they are not in principle failing their obligations.

Ultimately, Member States have not had sufficiently hard incentives to establish their national single windows in a harmonised way. Considering that technical assistance and voluntary guidelines have been offered but not widely applied, lack of resources, know-how or time are not assessed to have been the main barriers to implementation. It seems rather to be the absence of binding specifications and clear instructions causing the uncertainties.

Furthermore, the provisions have been too vague to support the Commission in pursuing infringements or other follow-up procedures.

The effect of the slow and uneven implementation of the RFD was to create additional differences between the reporting environments from one Member State to the next, aggravating the core problems as described above under drivers 1-3.

2.3. How will the problem evolve?

The RFD does not provide binding technical specifications for harmonised reporting interfaces or to include new or missing EU or national reporting obligations. The current situation with diversity of reporting procedures, formats and interfaces is unlikely to change in the future without EU level interventions[53].

The existing structures for exchange of best practices between the Member States[54] have not so far been effective for delivering harmonised implementation of the National Single Windows. Guidelines have been developed in close cooperation with Member States and technical assistance for implementation has been offered via EMSA. Quantitative estimates of the impact of these initiatives, in particular the uptake effect of the EMSA prototype, are not available but the Member States indicated in the consultations that **no further changes to current systems are planned as a result of these activities**. For the shipping operators, the administrative burden linked to lack of harmonised single entry point(s) and lack of harmonisation of data requirements will therefore remain high: in total 50 million staff hours

[53] At international level, the IMO application of Standard 1.3 *bis* to the FAL Convention should be in place by 8 April 2019, requiring all IMO member countries to establish systems for electronic exchange of information by that date (Source: http://www.imo.org/en/OurWork/Facilitation/Electronic%20Business/Pages/default.aspx). This will however not affect EU Member States since this electronic reporting is already mandatory under the RFD and the IMO Standard does not introduce any common technical requirements. The Commission has offered to assist the IMO in developing a harmonised reference system by donating the National Single Window prototype specifications and documentation to the IMO. However, no decision has been taken on their side to pursue that development.

[54] The High Level Steering Group on Governance of the Digital Maritime System and the eMS group

are estimated to be spent on reporting during the baseline period (EU28). In addition, new challenges and issues will emerge, risking render the current legal framework out of date.

More information on how the situation is likely to evolve until 2030 can be found in section 5.1.

3. WHY SHOULD THE EU ACT?

3.1. Legal basis

Article 100 (2) of the Treaty stipulates that "The European Parliament and the Council, acting in accordance with the ordinary legislative procedure, may lay down appropriate provisions for sea and air transport."

3.2. Subsidiarity: Necessity of EU action

The legitimate rights of Member States to manage and develop their port reporting systems must not unduly restrict the proper functioning of the internal transport market. Maritime transport is to a large extent a single market concern; only 9% of the seaborne trade in the EU is national, compared to 25% and 66% for respectively intra-EU trade and extra-EU trade. Moreover, the ports are not the final destination of the goods and via the hinterland connections a large part of the goods going through ports either comes from or continues to another Member State. It is therefore in the interest of the Union to ensure the smooth functioning of ship port calls, for the sake of the wider internal transport market and for the considerable economic investments and cross-border business interests linked to the sector.

The problems addressed by this initiative – inefficient reporting environment for shipping operators in connection to a port call, resulting in cumbersome administration for transport operators – are unlikely to be solved sufficiently by Member States in the framework of their national constitutional systems (necessity test) as the maritime transport is a highly international sector. Policies developed and implemented on a national or sub-national level are unlikely to produce solutions harmonised at the EU level (compare with successfully harmonised customs formalities thanks to Union Customs Code EU-level legislative package) and cannot efficiently address the *cross-border* information exchanges. Fragmented national legislation and transport systems, often incompatible with each other, lead to a sub-optimal situation as far as the Internal Market in maritime transport is concerned.

The inadequacy of voluntary harmonisation measures has also been clearly shown in the past. The existing non-binding guidelines and the regular interaction between Member States have not improved the situation and have not resulted in less fragmentation.

Stakeholders widely agree with this assessment, as expressed in the consultations where a majority of respondents (74%) in the open public consultation stated that these issues should be addressed on the EU level (87% of the shipping companies and ship masters; 69% of responding Member States). 82.5% of the respondents believed that the actions should be mandatory (97% of shipping companies and shipmasters; 67% of Member States). Most respondents believed that only soft measures will have low effectiveness, and hence bring very limited benefits.[55]

It could in principle also be considered to act on the matter primarily on the international level and via the IMO. However, the IMO only works by voluntary implementation and non-detailed specifications and has no mechanism for enforcement. While the IMO does address some of the ship reporting aspects such as the reporting formalities specified under the FAL Convention, the IMO does not address other of the policy areas covered by EU law[56]. Action only at international level will not bring added value for EU maritime transport operators with regard to the reporting environment. On the contrary, it is usually the EU that pushes the development of the IMO framework by being a forerunner in adopting more effective, efficient and harmonised rules; going further than the lowest common denominator agreements in the international forum. The harmonised reporting environment was not achieved by voluntary action at EU-level and it is highly unlikely that better results could be achieved by similar non-binding action via the international organisations.

3.3. Subsidiarity: Added value of EU action

The proposed action can be better achieved at Union level than at national level as substantial results can only be achieved by a coherent framework addressing pan-European needs.

The development and implementation of common standards and facilities need to be coordinated and aligned along with the other relevant EU and international initiatives and technological developments as well as socioeconomic developments. This work would normally primarily be done in the context of the underlying legal acts and the resulting data requirement agreements subsequently taken up in the RFD framework for the coordination of reporting. Such a framework permitting and ensuring the required connections and complementarity with the various existing reporting systems as well as development towards common data definitions can only be created at EU level. No international body provides an alternative forum for creating the coordination mechanism for the comprehensive body of ship reporting requirements under international, EU and national legislation.

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[55] Consultation synopsis report, Annex 2

[56] The IMO reporting standards do not cover all specified requirements set in the EU law. For example, FAL 5 and 6: crew and passenger lists do not include the Schengen Border Code visa requirements and FAL 2: Cargo declaration is missing the information required by the Union Customs Code on the Union status of the goods.

The European Union is in a privileged position to offer leverage and propagate best practices and common standards for harmonisation, to promote cross-border cooperation, and to facilitate the establishment of a wide market for digitalised transport services.

The competition between ports is strong and the port community often protective of its independence and individual competitive advantages. Only by acting at the EU level can the level playing field and the European Maritime Transport Space without Barriers be ensured.

As is shown in the analysis of impacts below, action at EU level to achieve full harmonisation could result in an administrative burden reduction of 50-75%[57] of the staff hours currently lost on overly cumbersome reporting procedures, with additional indirect benefits in terms of possible faster turn-around time in ports, better logistics chain predictability, higher job satisfaction among staff and gains in terms of more staff hours released for e.g. safety and business related processes on-board.

In addition, the initiative offers potential for further contributing to the efficiency of the entire Single Market multimodal transport chain by enhancing information flows and reducing potential bottle-necks in connection to port calls. There are, in particular, opportunities for added value in exploiting the data sharing aspects of the proposal to enable future cross-modal information exchanges and by ensuring that the harmonised data formats support interoperability across the transport modes.

4. OBJECTIVES: WHAT IS TO BE ACHIEVED?

4.1. General objectives

The general objective of the initiative is to contribute to the smooth functioning of the single market and facilitate trade and transport by addressing the currently cumbersome and diverse reporting procedures for ships calling EU ports.

This means a well-functioning, harmonised and future-proof digital reporting environment enabling interconnectivity and coordination of transport and customs related reporting, to improve the efficiency, attractiveness and environmental sustainability of maritime transport while contributing also to the integration of the sector to the digital multimodal logistics chain.

4.2. Specific objectives

The initiative will contribute to the general objective by pursuing the following specific objectives:

[57] Depending mainly on traffic type: fixed route or non-fixed route transports, affecting average reporting times and expected benefit of harmonisation. For more information on methodology, see Annex 4

- **To harmonise reporting procedures, interfaces and data formats** in order to support the European Maritime Transport Space without Barriers. This objective addresses the problem driver of diverse ship reporting procedures, interfaces and formats.
- To reduce administrative burden in ship reporting **by providing a single entry point**, thereby boosting efficiency, competitiveness, jobs and growth in maritime transport, ports and in connected sectors along the entire logistics chain. This objective addresses the problem driver of diverse ship reporting.
- To contribute to **increased efficiency** of digital reporting for maritime operators by **facilitating data sharing/reuse for the application of the "reporting only once" principle**. This will in turn contribute to the establishment of the Digital Single Market by removing legal uncertainties in the digital maritime transport environment, such as access to and transfer of open data, data liability, interoperability and standards, while taking in account relevant legal frameworks such as the General Data Protection Regulation (GDPR)[58] and the Regulation on electronic identification and trust services (eIDAS)[59]. This objective addresses the problem driver of unclear legal framework for data sharing.
- By adopting a clearer legal framework in line with the objectives above, with detailed provisions and binding technical specifications, the main barriers to implementation of the current RFD will be removed and the success rate of the new proposal is expected to be substantially higher than for the RFD.

[58] Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation)

[59] Regulation (EU) No 910/2014 on electronic identification and trust services for electronic transactions in the internal market

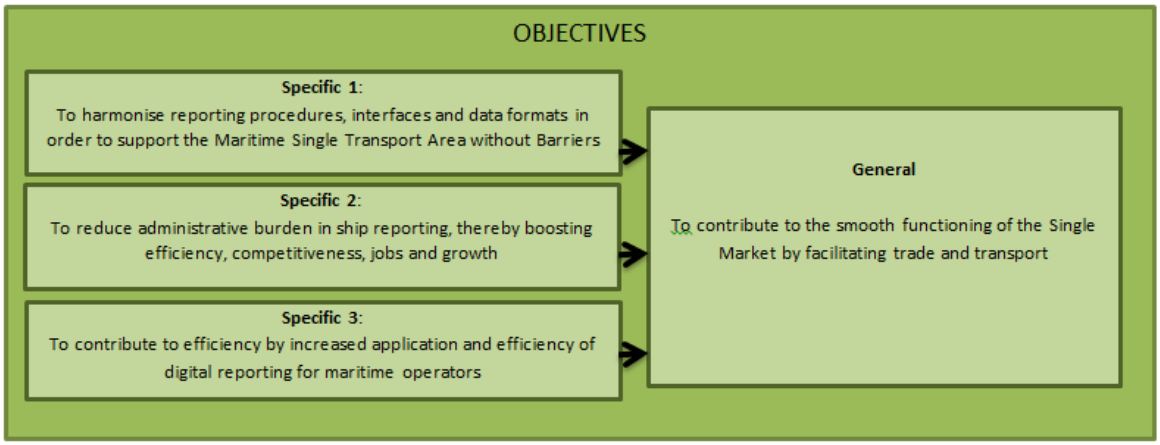

Figure 2: Objectives

5. WHAT ARE THE AVAILABLE POLICY OPTIONS?

5.1. What is the baseline from which options are assessed (Option 0)?

Under this option the Commission would continue to rely on the existing framework, without undertaking further action to address the weaknesses identified. Without EU level harmonisation, the reporting burden from a non-harmonised reporting environment is expected to remain unchanged. The baseline period has been set to 2020-2030, in line with that of other initiatives of the 3rd Mobility Package. There is no possibility of implementation earlier than 2020; beyond 2030 technical developments are expected to substantially change the overall reporting environment in unforeseeable ways.

The soft measures assumed to be continued in the baseline scenario (e.g. technical assistance, voluntary guidelines) would not be effective on their own, as already proven by past experience. In the consultations, Member States were asked whether they plan to develop their existing systems towards a more harmonised format on the basis of the existing support mechanisms from the EU.

In this respect, it is noteworthy that **no single Member State replied that they planned any such changes.** Harmonisation is therefore not expected to take place in the baseline period without additional EU action and the current problem are therefore unlikely to be solved in this scenario. This includes exchanging and using data and information for reduction of administrative burden and improving efficiency. Data re-use is expected to remain low due to the continued legal uncertainties on rights to use and share the information and the lack of clear mandatory obligation on Member States to enable such data re-use.

In the baseline scenario[60], the significant growth of the overall activity of the transport sector including shipping is projected to continue, driven by global economic and trade growth. These developments concern both passenger and freight transport with maritime freight transport projected to grow at higher rates than passenger transport, following more closely the GDP developments and the increasing demand for traded goods. International maritime activity (including both intra-EU and extra-EU) would grow by more than 70% between 2010 and 2050 (1.4% per year). For the cruise sector, a steady growth has been reported during the last decade and is expected to continue based on data from CLIA[61]. In addition, a 50% growth of cargo handled in EU ports is projected by 2030 according to a study of the European Parliament[62]. The modal share of maritime transport has remained fairly steady over time and is not projected to change significantly by 2050.

The expected growth of trade and, subsequently, in volumes, is however not expected to increase the number of port calls. The trend towards growing average ship size is likely to continue, with large-capacity and large-scale ships being increasingly in demand, notably for sake of economics of scale. This development will affect the total number of future port calls: larger ships will be able to carry the increased volume of cargo; therefore, the number of port calls will slightly decrease over time: by about 2% from 2020 to 2025 and by 1.3% from 2025 to the projected 2.02 million port calls in 2030. Growth of ship size is most visible in the container segment, with an average ship size increase of about 5%[63], and in the cruise segment, with an annual increase of about 4%.[64] For other ship types, the size is projected to remain relatively stable over time, in line with the historical developments. For authorities, continued digitalisation of government services and systems, as monitored via the EU Digital Economy and Society Index[65], is expected to continue, generating some benefits in terms of efficiency and simplification for ship reporting. The adoption rate however commonly varies with some Member States significantly more prone to quickly apply digital frameworks and others lagging behind. EU level digitalisation initiatives such as on *eDelivery*[66] for secure and

[60] The baseline scenario used for this impact assessment draws on an update of the EU Reference scenario 2016 and has been developed with the PRIMES-TREMOVE model by the ICCS-E3MLab.

[61] CLIA, *2017 State of the Cruise Industry outlook and Cruise Travel Trends Outlook*, https://www.cliaeurope.eu/index.php?option=com_content&view=article&id=102:clia-releases-2017-state-of-the-cruise-industry-outlook-and-cruise-travel-trends-forecast&catid=8&Itemid=111

[62] European Parliament; Directorate General for Internal Policies, *Modal share of freight transports to and from EU ports*, 2015, p.38, http://www.europarl.europa.eu/RegData/etudes/STUD/2015/540350/IPOL_STU(2015)540350_EN.pdf

[63] Eurostat; UNCTAD shipping statistics; https://www.statista.com

[64] ISL (2016), *Shipping statistics and market review 2016*, volume 60 - No. 8; http://www.cruiseindustrynews.com/cruise-industry-analysis/orderbook-data.html

[65] Digital Economy and Society Index 2017, https://ec.europa.eu/digital-single-market/en/desi

[66] https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/eDelivery

reliable exchange of data and documents as well as Horizon 2020 Information and Communication Technologies[67], may help push a more even implementation rate.

The average time estimated by shipping stakeholders in the current system is 1-3 hours per port call.[68] The wide range is explained by the very different reporting burden notably for vessels in tramp traffic[69] (60% of all port calls; mainly general cargo and bulk vessels of less than 10 000GT) compared to fixed route traffic (40% of all port calls; mainly other types of vessels and larger bulk vessels). These tramp /non-fixed route operators typically make port calls in multiple ports and multiple Member States, facing a higher burden of non-harmonised reporting (estimated average 3 hours per port call). Fixed route transport (e.g. ferries) and large liner vessels typically call in same and few ports and have lower average reporting times (estimated average 1 hour per port call). The non-fixed route operators typically run smaller vessels but make up 60% of all the port calls and a very high share of the total time spent on reporting in the EU.

When applying the more specific reporting time estimates for these different vessel and traffic types, the resulting estimate is a total of 4.6 million hours spent currently on reporting per year for all EU port calls. Despite the slight reduction in the total number of port calls over time (see section 2.4), the number of hours spent for reporting is projected to remain high, at 4.4 million hours by 2030. For the entire baseline period 2020-2030 and for EU28[70], 50 million hours are estimated to be spent on reporting, equivalent to around EUR 1.5 billion expressed as present value in 2020[71].

The current National Single Windows cost on average 265 000 per Member State and year in operational and maintenance costs. Taking into account the above presentation of projected problem evolution, development of number of port calls and the time spent on reporting in each port call, the **baseline cost for the National Single Windows for EU28 over the entire baseline period is estimated at EUR 108 million** (for the detailed cost calculations, see Annex 4).

The option of remaining at status quo also received very low support (7%) by all respondents in the consultations.

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[67] Horizon 2020: Information and Communication Technologies, https://ec.europa.eu/programmes/horizon2020/en/h2020-section/information-and-communication-technologies

[68] Depending primarily on type of traffic and vessel: fixed route/liner or non-fixed route/tramp traffic.

[69] Non-fixed route traffic

[70] Only actually impacting the *maritime* Member States in a EU28 scenario; all costs have also been calculated for an alternative non-UK EU27 scenario, see chapter 6 and Annex 4.

[71] Calculation based on a value of staff hour estimated at 38.35 € according to ECSA.

5.2. Design of policy options

A number of decisions were made as point of departure for identifying viable policy options. These choices have been made as a result of the consultations and following discussions with Commission and external experts. The purpose was to define at an early stage what solutions would solve the problems identified, be realistic and sufficiently acceptable to the main stakeholders.

1. In order to address the problem of inefficient reporting environment for ships, the main options considered here are **building on the already existing framework** (National Single Windows structure). This was a demand from Member States in the consultation event in October 2017[72]. Options that would require an entirely different set-up have therefore been discarded from consideration as it would be inefficient – and unacceptable to a main stakeholder group – not to make use of the investments and efforts already made. As mentioned in chapter 1, the National Single Windows perform two bundles of functionality: data collection from the front-end users (shipping operators) and data distribution to the back-end authorities (data recipients). The present initiative is concerned with the harmonisation of the reporting gateways, but does not change the connections to the back-end authorities beyond enabling more efficient data distribution and data sharing.

2. The new and harmonised reporting gateway should be **offered as a reporting path always available for shipping operators and accepted by authorities**, in line with the strong request from the shipping industry and as a trade facilitation measure. This does not mean that other reporting entry points must be banned, but only that if data providers choose to use the EU-level harmonised maritime transport gateway to submit their reporting formalities, data recipients must accept those submitted reports and refrain from requesting additional and separate reporting.

   There are two main reasons for not forcing the closure of all other reporting entry points beyond the digital harmonised maritime reporting gateway. First, it would be highly difficult to determine e.g. who should be included in the scope for reporting via this harmonised reporting gateway for maritime transport and who may use e.g. the customs IT systems directly. The maritime transport sector is highly heterogeneous and reporting requirements differ: some report all of the data elements, some (e.g. small vessels or operators on regular lines) have exemptions. Some split their data sets by having the cargo data reported via cargo agents, other report everything together. There is no sharp line between economic operators primarily affected by the maritime transport reporting, those primarily managing the customs formalities, and those concerned with both. For

[72] Consultation with the High Level Steering Group: Single Window Subgroup, 26 October 2018

those actors mostly working with the cargo issues, it will be easier to continue reporting straight into the customs IT systems; this possibility must therefore remain for them. Second, Member States may want to offer a national entry point for the vessels only active in national traffic (9% of maritime freight transport). If they find this convenient there is no reason for the Union to forbid such duplication. It may serve a purpose to give SMEs in national traffic a more local reporting path, especially in the case of an EU-level central gateway option. It is assumed that such national alternatives would primarily be interesting in the short-term and as a transition period since, following the consultations, it is clear that the great majority of shipping operators will prefer the offered EU-harmonised option. For the possibility to report directly to the individual back-end authorities and IT systems, this would not entail duplication of systems. A decision to maintain alternative reporting systems in the National Single Windows will rest entirely with the Member States.

3. The National Single Windows should **remain a coordination mechanism**, serving primarily as a router (with technical converter between data formats where needed) to pass two-way information between the maritime transport operators and the data recipients (e.g. port authorities, customs interfaces and IT systems, border control authorities, the SafeSeaNet, statistics authorities) with the aim to facilitate reporting for the maritime industry. The harmonised reporting gateway will not process data beyond data format translations/transformation, first data quality checking, certain (temporary) data storage for technical purposes or other procedures necessary to smoothly link the data from providers to recipients. All final processing will continue to be done by the specialised systems of the connected data recipients. The reason for this assumption is first, to avoid building new systems on top of the already functioning ones for the sake of costs and proportionality, and second to avoid incoherence and interference with the back-end systems where the data processing normally takes place. The objective of adding the harmonised reporting gateway is not to change the functionalities that National Single Windows and specialised systems already perform satisfactorily, but only to ensure a simplified and harmonised front-end of reporting to reduce shipping operators' burden.

4. The initiative **will not create new reporting requirements** but will coordinate the reporting between the data providers in the maritime transport sector and the data recipients as specified in the underlying legal acts referred to in the revised legal act. This may require translation of data formats in order to ensure a harmonised front end reporting (from the maritime transport operators) as well as reporting output at the back-end (to the connected entities and authorities receiving the data). Any reporting requests via the harmonised reporting gateway shall fully respect the applicable technical specifications of the underlying legal acts and IT systems supporting these underlying legal acts (e.g. customs legislation, SafeSeaNet requirements specified in the VTMIS Directive, etc.). This design principle follows on clear demands from both shipping operators and Member States.

5. The new reporting environment must **ensure clear and fair division of responsibility and accountability** for all connected entities, **including guarantee of the National**

Competent Authorities'[73] **full responsibility and liability for the intermediary services of the National Single Windows** vis-à-vis both the data providers and the connected data recipients (e.g. functional and legal responsibility, high availability, ensuring two-way flows of information, etc.). This is a logical point of departure for enabling a comprehensive scope and the well-functioning interconnection of maritime and customs reporting environments.

5.3. Description of policy measures and options

Taking into account the principles mentioned above and following the results of the consultations with the relevant stakeholders, a number of possible measures were identified. To address the first and the second driver, several possible mutually exclusive solutions have been identified. In addition, some measures are necessary to ensure a proper and well-functioning framework. These measures are common for all the options (complementary measures).

Mutually exclusive measures (alternative)

Problem Driver 1: Diverse ship reporting formats, interfaces and procedures used throughout the EU

No.	Policy measures A-D
Alt. A	**Harmonised reporting gateways as front-end to the National Single Windows (NSWs): based on binding technical specifications** Introduce binding harmonised requirements and technical specifications for the front-end reporting gateway in the existing NSWs in the Member States. The specifications would cover e.g. data content, message structure format, exchange protocols, user interface requirements and other rules as necessary for ensuring the necessary information exchanges business rules. They would be set at EU level but responsibility for implementation and operation would be fully on the Member States. The result would be a decentralised system of NSWs with identical reporting gateway functionalities for ship reporting.
Alt. B	**Harmonised reporting gateways as front-end to the National Single Windows (NSWs): based on common IT solution** Develop a mandatory common harmonised reporting gateway/ front-end interface component (IT solution) at EU level, for installation in every NSW. Regular updates as required would be supplied via the EU. The operational responsibility would be on Member States but with helpdesk functions for the software installation at EU level. The result would be a decentralised system of identical reporting gateways in every Member State.
Alt. C	**Central European level reporting gateway: introduction of a centralised European Maritime Single Window** Introduce a centralised, EU-level reporting gateway / front-end interface (European Maritime Single Window). The centralised reporting gateway would offer one single reporting entry point for all port calls throughout the EU including the necessary two-way

[73] The Member State authority charged with hosting and operating the National Single Window

	information exchanges between the data providers and the back-end connected entities and systems. The NSWs would remain in place as the router between the centralised reporting gateway and the national level data recipients. Member States would be responsible for ensuring connection of their National Single Windows to the centralised gateway.
Alt. D	**Mandatory Port Community Systems (PCS) as basis for harmonised reporting gateways in Member States (technical specifications)** Build the EU level harmonisation requirements and binding technical specifications on mandatory PCS reporting gateways in the Member States (all other details same as in alternative A above).

Problem Driver 2: Diverse ship reporting information requirements throughout the EU – several parallel reporting entry points

No.	Policy measure
Alt. 1	**Comprehensive single entry point solution (introduction of a mandatory comprehensive Maritime Single Window data set)** Set a wide scope for the reporting by ships in connection to a port call to be accepted via the harmonised reporting environment: covering the current scope of RFD, the national reporting requirements and channelling of customs formalities for ships into (and return messages from) the customs IT systems at national and EU level.
Alt. 2	**Separate entry points customs / maritime (introduction of a mandatory limited Maritime Single Window data set)** Set a limited scope for the reporting by ships in connection to a port call to be accepted via the harmonised reporting environment: covering the current scope of RFD and the national reporting requirements. Customs formalities to be reported via the parallel and harmonised customs IT systems.

Common/complementary set of measures (enabling framework)

Problem Driver 2: Diverse ship reporting information requirements throughout the EU – several parallel reporting entry points

No.	Policy measure
I	**Introduction of specifications for acceptance of e-certificates** Enable development of e-certificates acceptance by initiating processes for specifications and technical solutions (e.g. common registries).

Problem Driver 3: Unclear legal framework for sharing and using reporting information – no "reporting only once"

No.	Policy measure
II	**Establishment of data re-use principles for "reporting only once"** A set of clear principles, rules and rights for data sharing and reuse will be developed to ensure correct and smooth data management and "reporting only once" for carriers, as a minimum first step within the same port. Clear definitions for different requirements will be provided. Definitions and specifications concerning the processing and management of personal or commercially sensitive data will be addressed.
III	**Development of common databases to support the system** This includes a common exemption database, a common (federated) user database(s) and a common ship repository for improved data flows and data exchanges.

Problem Driver 4: Inadequate implementation

No.	Policy measure
IV	**Introduction of a governance mechanism** A governance mechanism will be created to ensure timely and appropriate legal and technical updates. Implementing and/or delegated powers for maintenance of e.g. the technical specifications are proposed. This will be accompanied by the set-up of the required expert groups for coordination and consultation with Member States and with industry stakeholders as needed.
V	**Development of a complaint/feedback mechanism** A complaint/feedback mechanism will be offered to maritime transport operators as a tool to alert authorities if the harmonised reporting and the reporting only once principles are not respected or if any technical fault is found in the reporting systems.
VI	**Development of helpdesk function** To facilitate implementation, technical support to Member States on the reporting environment specifications and possible IT solution in the form of e.g. helpdesk functions, technical advice or development of application guidelines will be developed.

The measures have been packaged in policy options along the two main dimensions: to address the harmonisation requirements (mutually exclusive measures A-D) and to define the scope of what shipping operators can report via the harmonised reporting environment (mutually exclusive measures 1-2). Six measures (I – VI) are common for all policy options.

As a result, eight policy options have been considered and six of them have been retained for in-depth analysis, in addition to the baseline (see section 5.1):

	A: *Harmonised NSW gateways: technical specifications*	B: *Harmonised NSW gateways: common IT solution*	C: *Central reporting gateway*	D: *Mandatory PCS (discarded)*
1. Comprehensive single entry point solution	Option A1: Measures A, 1 and I-VI	Option B1: Measures B, 1 and I-VI	Option C1: Measures C, 1 and I-VI	Option D1: Measures D, 1 and I-VI
2. Separate entry points customs / maritime	Option A2: Measures A, 2 and I-VI	Option B2: Measures B, 2 and I-VI	Option C2: Measures C, 2 and I-VI	Option D2: Measures D, 2 and I-VI

Table 1: Policy options

The main difference between the options is in terms of roles and responsibilities and the division of tasks between Commission and the Member States, as is further described below.

5.3.1. Policy option A1: Harmonised reporting gateways as front-ends to the NSWs: binding technical specifications and requirements (decentralised/distributed) - comprehensive scope

Harmonisation

Policy option A1 is to introduce binding requirements and technical specifications for harmonising the reporting gateways (front-end interfaces) of existing National Single Windows in the Member States. The specifications would cover data content, message structure format, exchange protocols, user interface requirements and other rules as necessary

for ensuring the necessary information exchanges. They would be set at EU level but responsibility for implementation and operation would be fully on the Member States. It would also be the responsibility of Member States to prepare and perform updates, maintenance and support services as required. Coordination and overview of updates for permanent alignment with relevant legal and technical developments should be led by the Commission with support of relevant experts. The technical specifications will be designed with a view to enable full interoperability between the National Single Windows, future-proofing for next phases of more access and exchange of relevant data (see also section on data re-use below).

The result would be a decentralised system of very similar (subject to possible nuance interpretations of the specifications at Member State level) National Single Window front ends, allowing the shipping operators to adjust their reporting systems only once for being able to report in any EU port in the same way.

The technical specifications for data and interfaces will be designed to enable both machine-to-machine reporting and reporting via graphic user interface to meet the needs of all kinds of shipping operators. In the longer term, specifications for reporting from autonomous ships could also be introduced[74].

The option requires a connection between the National Single Window and all entities and systems assigned by the underlying legal acts to connect as back-end data recipients; e.g. by connecting the National Single Window as a user to the relevant customs trader interfaces. The back-end technical specifications, from a National Single Window to a relevant local, national or EU level system, would be derived from the requirements in the underlying reference legal acts to ensure all relevant entities continue to receive the data, reports and notifications in a useful and timely manner and in compliance with the functional requirements and technical specifications of the recipient systems (i.e. customs systems). Coordination or data format translation efforts will be needed if several connected entities require the same information in different formats. The National Single Window would thus have a routing and, where/if needed, a technical data format translation function.

The data and notifications/declarations received from shipping operators would be split so that each data recipient only receives specific data elements ("need to know" basis). Information flows shall follow the timelines for fulfilment of respective reporting needs; notably the timelines for customs formalities as prescribed in the customs legislation. Declarants (shipping operators) will remain liable and responsible for the correct and timely submission of their reports and notifications. For any potentially personal data, the data recipient will be responsible and accountable for managing the data in line with all applicable

[74] Likely not needed as the reporting is location agnostic from a technical point of view.

data protection rules (e.g. GDPR, national requirements) to ensure proper data privacy including no storage of sensitive data beyond prescribed timelines.

Any feedback provided by relevant authority, port operator or port service provider should be send to the declarant via the same channel as received. To facilitate reporting from maritime carriers, where internet connection is sometimes lacking, offline options for reporting will be considered, where appropriate and possible.

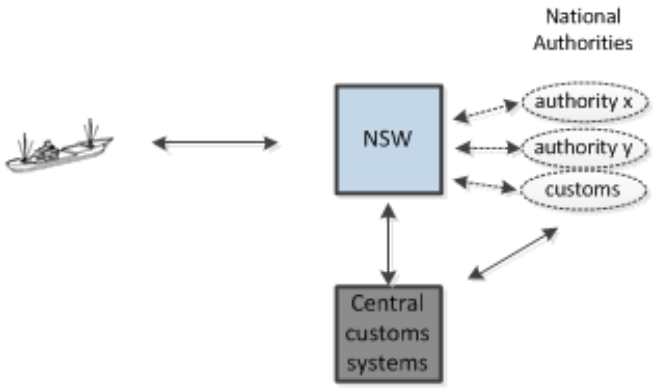

Figure 3: Data flows in option A1[75]

Scope of reporting

The body of data elements which are, on basis of EU, international or national law, asked from a ship at a port call, must be clearly defined for the European Maritime Single Window environment. The data elements agreed for this scope must then be coordinated and harmonised into an agreed format for the shipping operators at front-end, to avoid duplications and to ensure harmonised reporting.

The new legal proposal should therefore include references to this wider set of underlying legal acts for the scope. In addition, a more detailed data set would be needed as a technical tool to aid the front-end interface set-up and as a service and business guidance to the maritime transport operators. This technical tool data list would be a living document to reflect – not prescribe – the data requirements following any legislative updates or updates of technical specifications of the underlying back-end systems. Authorities must not request these data set elements in non-harmonised format nor ask for *additional* data outside of the

[75] The figures illustrating the data flows via National Single Windows in chapter 5.3 are simplified illustrations of the policy options; more detailed diagrams showing connections, interlinkages between IT systems and other potential reporting paths can be found in Annex 6

single window reporting environment. The aim is to protect shipping operators from excessive administrative burden.

In option A1, the scope of the European Maritime Single Window environment covers the *comprehensive set of all reporting for a vessel to perform a port call*. This would include e.g. all entry/exit formalities and notifications required from the carrier by customs[76] (under the Union Customs Code; reference to UCC to be included into the new RFD legislation) and all national level data elements (Part C of the current RFD, Annex 1).

This is in line with stakeholders' opinions reported in the consultations. 82.5% of all responders to the public consultation (93.5% of all shipping companies and ship masters; 50% of all Member States[77]) stated that national requirements should be included in the new framework in order to harmonise all information required for a port call. 6.5% of all open public consultation respondents did not agree the national requirements should be included (0% of shipping companies and ship masters; 19% of Member States) and 11% had no opinion or felt neutral to the proposal.

These results are also in line with those obtained during the evaluation[78] when a large part of the shipping stakeholders specifically ask also for a more comprehensive approach to maritime transport and customs reporting. The European Community Shipowners' Association stressed that: "It goes without saying that we want the customs reporting to be part of it as well. Only in this way shipping can finally enjoy the single market."[79]For *rationalisation and simplification*, the scope of the fully harmonised Maritime Single Window data set – notably the national data elements from current RFD, Part C – will be scrutinised in a process together with Member States and connected authorities to ensure that unnecessary (e.g. traditionally requested but now redundant) data elements are over time cleared from the reporting requests.

In order to enable this comprehensive data set, timelines and data requirements must be aligned in detail with the current developments of the customs IT systems. The IT systems related to the customs formalities proposed to be included in the scope of the RFD successor (e.g. ICS2) are scheduled to be ready by 2024-25. The implementation of the comprehensive European Maritime Single Window environment should be prepared with technical set-ups and test runs to align with this time frame. All customs reporting via the European Maritime Single Window environment should then be in direct correspondence with the rules, specifications and requirements derived from the Customs legislation and technical

[76] Currently: Entry Summary Declaration, Arrival Notification, Presentation Notification, Declaration for Temporary Storage, Customs Goods Manifest, Electronic Transport Document for simplified transit, Re-Export Notification, Exit Summary declaration and Exit Notification

[77] For further detailed breakdowns of all these statistics, see Consultation synopsis report in Annex 2

[78] *Evaluation of the RFD*, p.47-48

[79] ECSA, *A single market for shipping – time to make it happen*

specifications of the underlying customs IT systems, and reflect any amendments and updates in these underlying legal acts and specifications.

Initiate development towards e-certificate acceptance

Just above 80% of respondents to the open public consultation also stated that the new framework should include provisions on certain e-certificates (notably ship certificates) to allow for future fully paperless ships. This issue will be addressed in the revised reporting formalities framework with appropriate references and links to the parallel initiative on electronic transport documents. IMO has also issued *Guidelines for the Use of Electronic Certificates*[80] promoting the use of secure e-certificates for maritime transport.

The common databases and registries anyways established in the European harmonised digital reporting s environment could in later steps be exploited to also allow and enable future secure use of e-certificates and reference numbers for EU port calls.

Development of clear data re-use principles for step-wise process towards "reporting only once" of same data

In its Council conclusions on *Digitalisation of transport* on 5 December 2017, the European Council specifically called on the Commission to apply the 'once only' principle when developing new or revising existing legislation, in order to keep it fit for the digital age. The "once only" principle aims to reduce administrative burden by avoiding that the same business actor is required to supply *the same information* more than once to the authorities, as first priority within the same port. The goal is to "get the data to circulate, not the user"[81]: authorities may not request that an operator submits again the same, unchanged data as already sent, unless for corrections or updates. This does not imply that the transport operators will not be obliged to report at several different points in time (e.g. customs formalities required by law at several phases: e.g. early stage before a planned port call, formalities required closely before calling a port and formalities upon departure from port). New or changed data must always be reported again.

There has been a strong message from consulted stakeholders that the reported information should be more efficiently shared and reused, both to reduce the burden of reporting and for the sake of maximising multimodal transport facilitation.[82] Better access to data contributes to facilitating digital solutions for "smart ports", significantly speeding up ports procedures with indirect cost-savings and business opportunity improvements for the entire multimodal

[80] FAL.5/Circ.39/Rev.2, April 2016

[81] EY and DTI for the European Commission, *Study on eGovernment and the Reduction of Administrative Burden*, 2014, p.29, https://ec.europa.eu/digital-single-market/en/news/final-report-study-egovernment-and-reduction-administrative-burden-smart-20120061

[82] Consultation workshop: *Moving towards a European Maritime Single Window environment – what road to take?* (80% of those who voted in the session poll)

transport chain.[83] 80.5% of all respondents stated in the open public consultation that they would have some or high benefits from more data sharing and data re-use (75% of the Member States, 83.5% of the shipping companies and ship masters, 100% of the ship agents). 11% of the consulted stakeholders expected related benefits to be low (12.5% of the Member States, 10% of shipping companies and ship masters) and 7.5% expressed no opinion on this question. According to the respondents, the benefits would be increased productivity and time savings from avoiding duplicate reporting.

A set of clear principles, rules and rights for data sharing and reuse will therefore be developed to ensure correct and smooth data management and "reporting only once" for carriers. As a minimum first step, the data re-use within the same port must be addressed. Clear definitions for different requirements will be provided, filling the gaps of the current legal framework. Clear roles, responsibilities and accountability for all entities connected to the system will be defined, together with legal obligations/enablements set out in the legislative framework together with the necessary business rules, common standards and procedures. Coordination and technical support should be offered to the connecting entities if needed.

The protection of personal data must be well covered in the system, e.g. by ensuring that personal data is erased without delays once not needed, in compliance with the General Data Protection Regulation. A distinction will be made between non-personal and personal data including with clarity in definitions of e.g. data reports including the name of the responsible data provider (e.g. ship master). Definitions and guidelines concerning the processing and management of commercially sensitive data will be addressed.

For supporting and enabling real, efficient and secure application of the "reporting only once" principle, common eGovernment building blocks[84] e.g. for eID and eSignature should be exploited.

The aim is to enable the application of "reporting only once". To achieve this, a step-wise approach will be taken, with the requirements for sharing of *static information* and sharing within the same port as a first priority. In subsequent steps, data re-use and data sharing in support of multimodal transport services and more efficient functioning of the logistics chains will be addressed including increased data sharing for "reporting-only-once" at Member State and EU level. Reuse of declarants' own historical data submitted earlier to another node in the reporting environment should be facilitated where possible.

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[83] Boston Consulting, *The Digital Imperative in Container Shipping*, 2018, https://www.bcg.com/publications/2018/digital-imperative-container-shipping.aspx

[84] *EU eGovernment Action Plan 2016-2020 Accelerating the digital transformation of government,* COM/2016/0179

Development of common databases

For a new legislative framework under policy option A1 to work smoothly, it would be necessary to introduce certain common databases to support the interconnected system. This will include a common exemption database, a common (federated) user database(s)[85] and a common ship repository. These common tools would ensure efficient flows and exchanges within the European Maritime Single Window environment (decentralised or centralised). eGovernment building blocks and existing tools for e.g. digital signature and eID would be applied; Horizon 2020 Information and Communication Technologies[86] and relevant industry guidelines[87] will be taken into account.

Introduction of a governance mechanism

To ensure flexibility and to keep the legislation relevant for the long-term in view of technical and legal developments over time, a governance mechanism must be created. This is especially the case to ensure the system remains maximum efficient also with a view to ICT innovations and new technical possibilities developing. Implementing and/or delegated powers for maintenance of the technical specifications and control of related updates, for the harmonised technical data set and for the data reuse rules and rights will therefore be needed. This will be accompanied by the set-up of the required expert groups for coordination and consultation with Member States and with industry stakeholders as needed. The governance mechanisms should be coordinated by the Commission transport sector but would closely involve relevant Commission services/agencies from all involved policy areas.

Development of a complaint/feedback mechanism

The Commission is responsible for appropriate follow-up and possible infringement procedures in case of Member States non-compliance, in order to ensure business continuity and equal access to harmonised services for the maritime transport operators. With more clear and specific legal provisions of the new legal proposal (in particular: detailed binding specifications), the Commission will have the possibility of pursuing effective infringement procedures, unlike under the current RFD.

Member States and their National Competent Authorities in charge of the National Single Windows will in turn be responsible and accountable for the implementation of the harmonised reporting gateway/front-end. They will also be responsible for the connection to the back-end entities at EU and national level.

[85] Cf for example the common user database for the customs IT systems: EORI

[86] https://ec.europa.eu/programmes/horizon2020/en/h2020-section/information-and-communication-technologies

[87] The Guidelines on Cyber Security Onboard Ships (http://www.ics-shipping.org/docs/default-source/resources/safety-security-and-operations/guidelines-on-cyber-security-onboard-ships.pdf?sfvrsn=16)

A complaint/feedback mechanism will also be developed, offering the maritime transport operators a tool to alert authorities if the harmonised reporting and the reporting only once principles are not respected or if any technical fault is found in the reporting systems.

Introduction of helpdesk function

To facilitate implementation, technical support on the functioning of the European Maritime Single Window environment specifications in the form of helpdesk functions, technical advice and development of application guidelines or other tools to support the Member States will be developed. The helpdesk is for the Member States and will in options A1-A2 focus on providing support on the interpretation of the technical specifications and the data set. This support may also be provided in forms of offered trainings. Support functions towards the front-end and back-end users (data providers and data recipients) will continue to be the responsibility of the National Single Window competent authority. Clear information to business operators about access to the specific content-related helpdesks for various parts of the reporting formalities will be available.

5.3.2. Policy option A2: Harmonised reporting gateways as front-ends to the NSWs: binding technical specifications and requirements (decentralised/distributed) – limited scope

Policy Option A2 is exactly the same as policy option A1 with the difference that the scope is limited to cover only the current mandatory RFD reporting formalities and the national legal requirements (current RFD Part C data). The customs IT systems will remain as a parallel interface for completion of customs formalities.

This option would, according to the consulted shipping operators, not fully solve the issue of shipping operators being required to report to several reporting entry points (the harmonised reporting gateway(s) for maritime transport and to the various harmonised customs trader interfaces and portals). The harmonisation of information requirements at customs level will still be achieved, as it stems from the already adopted UCC legislation. Without the interconnection with the customs IT systems, the timeline could be shortened and implementation of the European Maritime Single Window environment will be more flexible. With this option, complex interlinkage between the European Maritime Single Window environment and the customs IT systems will not be implemented, avoiding risks of non-synchronisation between back-end entity technical specifications and the maritime reporting gateway. The risk of technical failures will therefore be reduced, same as the development and maintenance costs related to the project implementation.

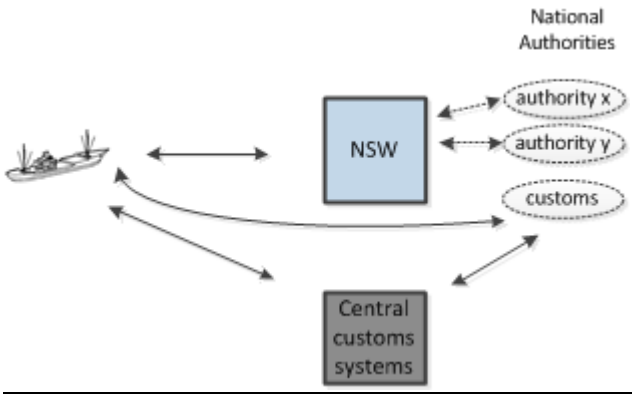

Figure 4: Data flows in option A2

5.3.3. *Policy option B1: Harmonised reporting gateways as front-ends to the NSWs: common IT solution for harmonised interface and formats (decentralised/distributed; EU-level development responsibility, Member State operational responsibility) - comprehensive scope*

Option B1 is to develop a mandatory common reporting gateway IT solution[88] at EU level and deliver it to all Member States for installation in every National Single Window as a harmonised front-end interface towards the shipping operators. The front-end component will enable submission of data in a common EU format to different National Single Windows by converting the harmonised data to a specific national format used by the National Single Window, and vice versa. The front-end component could also provide data validation and authentication functionalities. The National Single Windows will plug in this new harmonised front-end reporting gateway into their existing system, simply replacing the old user interfaces. The front-end IT solution will be developed as open-source software, therefore allowing the national competent authorities to easily modify the back-end of the reporting gateway for the plug-in to their National Single Window, if necessary.

For all other functionalities, the National Single Windows will remain the same, performing the same role towards the back-end entities and requiring minimum adaptations.

The reporting gateway IT solution will be developed as in option A, at EU-level. The common data format translation keys for any transformations done by the front-end component from EU formats to national formats would also be developed at EU level, based on the data mapping already completed. Regular updates as required would be supplied via

[88] For the machine-to-machine reporting, this would be built in the form of a "middleware" software component enabling communication between the two different system environments (on the one hand the shipping operators and on the other hand the data distribution functionality of the National Single Window).

the EU (task may be delegated to a technical support function) following update plans agreed together with the Member States (governance mechanism). The technical implementation for this option will take into account the approach and progress made with the ICS2 Trader Interface as a dedicated channel to receive the Entry Summary Declaration (ENS). The development cost for this common IT solution would be carried at EU level including for all updates required to remain aligned to the technical specifications of the underlying legal acts. Responsibility for the functioning of the front-end component would be on the EU-level entity in charge of the task. Member States would be responsible for adopting/installing the front-end component package within given timelines and to follow instructions for regular and timely updates and maintenance of the system. The operational responsibility would be on Member States, providing helpdesk functions for their connected national entities and for the front-end data providers. Some helpdesk functions towards the National Single Windows regarding the front-end component and specifications will be provided at EU level.

The result would be a decentralised (distributed) reporting system of **identical reporting gateways** in every Member State. As in option A1, the Member States would still be free to organise the back-end connections including to Port Community Systems however they prefer, as long as the set-up respects the common rules and specifications and the quality of services and information flows between the maritime transport operators and the connected entities and authorities remain sufficiently high.

Main principles concerning all sub-measures including scope, liability and responsibility for all involved entities, EU level coordination and governance mechanisms, e-certificates initiative, helpdesk functions etc. would be arranged as in option A1 above. Governance and helpdesk functions will be required regardless of the policy option, as technical enablers to ensure the reporting environment works smoothly and can remain aligned with legal and technical developments. In options B1-B2, the helpdesk will provide support on the installation of the front-end gateway solution to the National Single Windows.

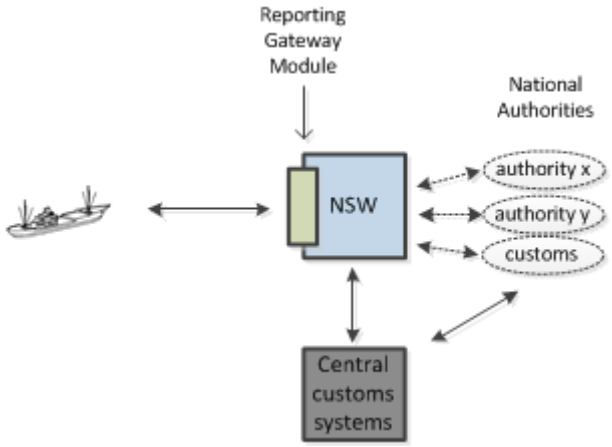

Figure 5: Data flows in option B1

5.3.4. Policy option B2: Harmonised reporting gateways as front-ends to the NSWs: common IT solution for harmonised interface and formats

(decentralised/distributed; EU-level development responsibility, Member State operational responsibility) – limited scope

Option B2 is exactly the same as policy option B1 with the difference that the scope will be limited. In option B2, the same limited scope / technical data set is considered as in option A2.

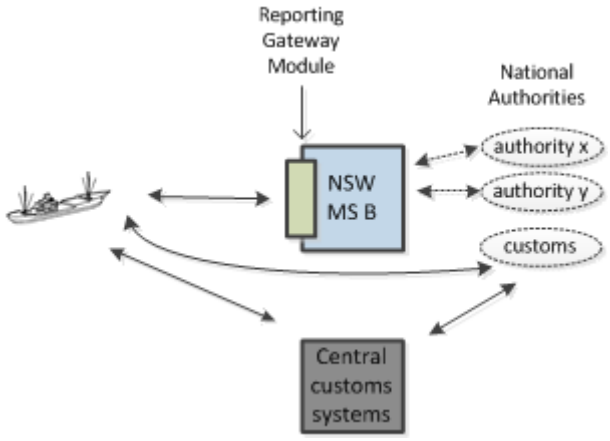

Figure 6: Data flows in option B2

5.3.5. Policy option C1: Harmonised reporting via a central gateway (centralised solution) – comprehensive scope

Option C1 is to introduce a centralised European reporting gateway hosted and operated by an EU-level entity or technical support function. The centralised window would offer one single reporting entry point for all port calls throughout the EU including the necessary two-way information exchanges between data providers and connected entities and systems. Shipping operators would also still have the choice to report directly to the various customs trader interfaces. Member States may also in this case want to continue maintaining the old reporting gateway (front-end interface) of the National Single Windows as an option for SME operators in domestic traffic. However, if a shipping operator chooses to report via the centralised European reporting gateway, authorities would not be allowed to request additional reporting also via other entry points (reporting only once).

The centralised European reporting gateway would channel incoming reporting and notifications directly to other EU-level systems, such as the Harmonised Trader Interface[89] for customs entry summary declarations. It would channel other data via the National Single

[89] For more detailed information and overview of all connections between the European Maritime Single Window environment and customs IT systems, see Annexes 6-7

Windows for transmissions to national level data recipients. Help desk and other support related to the functioning of the European reporting gateway will be provided at EU level.

The National Single Windows would remain in place but with adaptations. They would serve mainly as a router between the centralised European gateway and the national level data recipients (receiving data from the central front-end gateway and continuing the functionality of distributing that data to national level back-end entities). Member States would be responsible for ensuring connection of their National Single Windows to the centralised gateway. In principle, National Single Windows could also continue to offer an alternative reporting channel through their former front-end gateways. If Member States wish to maintain this possibility as a voluntary alternative for the maritime operators it would be allowed – in addition to, not a replacement of the centralised European reporting gateway.

Strong back-up and cyber security solutions would be required to ensure resilience and availability of the system.

Main principles concerning all sub-measures including scope, liability and responsibility for all involved entities, EU level coordination and governance mechanisms, e-certificates initiative, helpdesk functions etc. would be arranged as in options A1 and B1 above. The helpdesk in option C1-C2 will provide support to Member States on all issues regarding their connection into the centralised reporting gateway, as well as on the common data set and data formats. Support towards national back-end entities continues to be provided via National Single Window competent authorities.

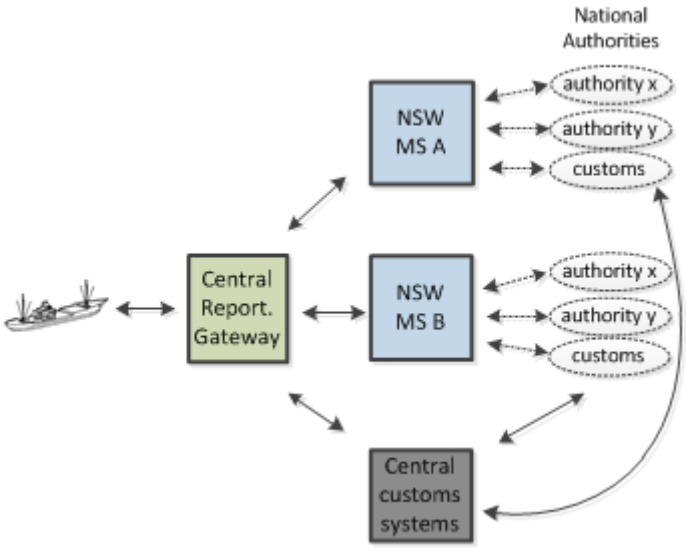

Figure 7: Data flows in option C1

5.3.6. Policy option C2: Harmonised reporting via a central gateway (centralised solution) – limited scope

Option C2 is exactly the same as policy option C1 with the difference that the scope will be limited. In option C2, the same limited scope / technical data set is considered as in options A2 and B2.

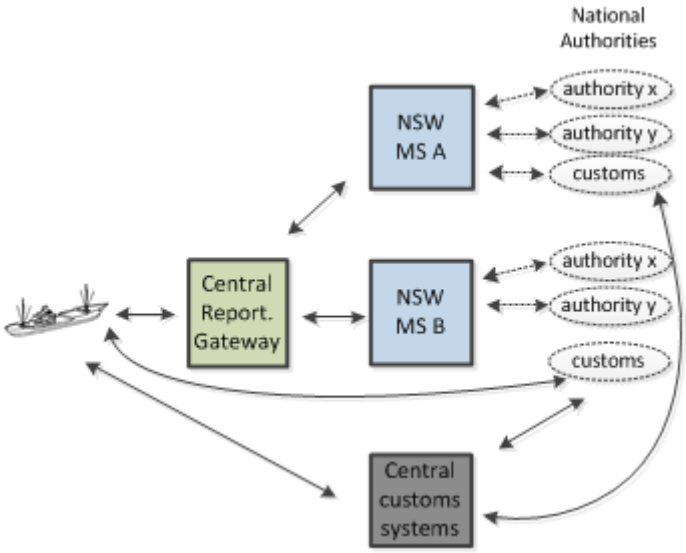

Figure 8: Data flows in option C2

5.4. Overview of main differences between the harmonisation solutions

	Options A1-A2	Options B1-B2	Options C1-C2
Harmonisation tool	Harmonisation achieved via legally binding common technical specifications for Member States to implement a harmonised reporting front-end gateway to their National Single Windows.	Harmonisation achieved via identical front-end components for the harmonised reporting gateway, developed at EU level and installed at each National Single Window	Harmonisation achieved via a centralised gateway at EU-level. The gateway will provide single EU-level entry point for the reporting. It will forward the received information to the National Single Windows and provide users authentication, validate data and provide logging and monitoring functionalities.
Role of Member States	To develop the new front-end solution based on the EU specifications, adapt the National Single Window accordingly and to continue to operate and maintain the National Single Window.	To plug in the provided front-end component to their National Single Windows and to continue to operate and maintain the National Single Window.	To adapt the National Single Window to be connected with the centralised gateway layer including shifting some functionalities from front-end to routing roles; to operate and maintain the National Single Window as routing structure.
Role of the EU	To deliver the technical specifications; to coordinate the governance and updates	To develop and deliver the common IT solution that can be plugged in at all National Single Windows as the new	To develop, establish and operate the central reporting gateway; to coordinate the governance and updates

		reporting gateway; to coordinate the governance and updates.	
National Single Windows	Remain as the reporting entry points, adapted to the harmonised format; will provide the Graphical User Interface (GUI) for shipping operators; will continue to provide national back-end connections and services for relevant authorities; will provide independently all functionalities.	Remain as the reporting entry points, compatible with the harmonised front-end IT solution; will provide the Graphical User Interface (GUI) for shipping operators; will continue to provide national back-end connections and services for relevant authorities; will provide independently all functionalities, possibly excluding the data-type validation.	Will include a new routing function between the local and national authorities and the central data entry point but may also remain capable to receive reporting directly from shipping operators; will continue to provide national back-end connections and services for relevant authorities; will depend on centralised gateway for many services such as GUI, logging, monitoring and identity management.
EU-level helpdesk function	Training/support offered to Member States	Will provide support to Member States on instalment and functioning of the front-end IT solution	Will provide support to Member States on the connections between National Single Windows and the central gateway; provide support for shipping operators on connecting with the gateway.
Governance	Commission services and relevant agencies together with Member States experts and industry observers to keep overview of updates and coordination of specifications and data set.	Commission services and relevant agencies together with Member States experts and industry observers to keep overview of updates and coordination of specifications and data set.	Commission services and relevant agencies together with Member States experts and industry observers to keep overview of updates and coordination of the data set.

Table 2: Core differences between options

The outcome vis-à-vis the shipping operators is in all cases more or less the same (identical reporting gateways regardless of the port in options B and C; harmonised functionalities and more or less the same gateway towards shipping operators in options A). These differences have impact on the cost estimates presented in a section below. In all options, the likelihood of achieving harmonised reporting is far higher than for the current legal framework (baseline) as a result of either binding specifications, a delivered identical gateway solution for all National Single Windows or the establishment of a central reporting gateway.

In all the options, a mix of expertise will be needed for the implementation and development of IT systems. The bulk of the work and the main responsibility for the project management will be for the Commission, contracting specific IT development services from external service providers where needed. Technical expertise from specialised Commission services and decentralised agencies will be involved as appropriate. The exact division of detailed tasks (e.g. service contracting) can only be decided at a later stage in connection with the implementation phase and following the set-up of detailed work plans in delegated/implementing acts.

5.5. Discarded policy options

5.5.1. Policy options D1 – D2: Harmonised reporting via mandatory PCS: binding technical specifications and requirements (decentralised/distributed) – comprehensive and limited scope

Options D1 and D2 build the EU level harmonisation requirements and binding technical specifications on mandatory Port Community System reporting gateways in the Member States. A Port Community System is defined as an electronic platform connecting the systems operated by the organisations and entities making up a seaport community. The Port Community System facilitates exchange of operational or administrative information between different actors in the port[90]; it can also include systems for optimisation of processes (e.g. "smart ports" systems). The PCS can be operated and maintained either by a public, private or public/private organisation.

By linking the technical specifications to mandatory Port Community Systems, the reporting environment would build on the systems already in place in many Member States; other Member States/ports would need to adapt by establishing (purchasing) such systems.

In the consultations, shipping companies noted that this option is not viable, notably since Port Community Systems normally are fee-based and the costs for shipping operators would therefore increase. The option was supported by no shipping companies in the targeted consultations and overall seen as potentially effective by only by 11% of all consultation participants; somewhat higher share among ports and port community system providers (31%).

It was also highlighted in the consultations that this might be an option for large ports but was impractical as general solution since small ports today do not usually apply Port Community Systems. At the present time, less than half of all EU ports have Port Community Systems in

[90] J. Rodon, and J. Ramis-Pujol, "Exploring the Intricacies of Integrating with a Port Community System", 19th Bled eConference eValues, Bled, Slovenia, 2006

place, usually big ports with high volumes of traffic[91]. According to IPCSA, among the 20 major European ports, 75% deploy Port Community Systems.

It is therefore found to be unrealistic and disproportionate to *oblige* all small and medium-sized ports to invest in Port Community Systems and to prescribe a legal obligation for Member States to apply such commercial systems; this should instead remain a free choice.

It should be noted however that the remaining policy options do not exclude the possibility for Member States who choose, voluntarily, to build their National Single Windows on existing Port Community Systems.

6. WHAT ARE THE IMPACTS OF THE POLICY OPTIONS?

In this section the quantifiable and qualitative economic, social and environmental impacts for the different options are presented. They draw on the excel-based tool developed by COWI and Gartner in the context of the Impact Assessment support study and on the modelling performed by ICCS-E3MLab and TRT with the PRIMES-TREMOVE and TRUST models. The 2020-2030 time horizon has been selected for assessing the impacts, in line with that of other initiatives that are part of the 3rd Mobility package. A discount rate of 4% has been used for calculating the present value, in line with the Better Regulation guidelines.

6.1. Economic impacts

6.1.1. Benefits: reduced administrative burden[92]

The harmonisation of the reporting formalities is going to bring benefits to the shipping operators and the industry, as the staff – generally the shipmaster – is expected to spend less time (as expressed in terms of staff hours) on reporting tasks. Ports, Member States and other connected authorities are not expected to incur direct cost savings in terms of reduced administrative burden from harmonisation.

While the magnitude of the benefits is expected to be similar regardless of which harmonisation mechanism is applied (option A, B or C), the range of reporting formalities considered (options 1 or 2) is likely to have an impact on the benefits. Therefore, the benefits

[91] Compared to the situation in 2010 when an impact assessment on e-maritime initiative found that about 60 out of 1200 European ports had a Port Community System in place: e.g. *SKEMA e-Maritime Initiative Periodic Study, Task 2 - Annex 4: Inventory of Port Single Windows and Port Community Systems,* 2010. A recent IPCSA estimate is that 75% of the 20 main European ports have PCS; for small and medium-sized ports PCS connections are less frequently in place.

[92] For the estimates of reduced administrative burden, a similar methodology as in the support study by COWI has been used, but applying a more cautious sensitivity analysis therefore arriving at more conservative benefit estimates than in the support study.

of options A1, B1 and C1 are assessed together in a first section; followed by an assessment of options A2, B2 and C2 together.

Options A1, B1, C1

The time savings for shipping operators in a harmonised reporting environment as compared to the baseline scenario are estimated to around 25 million staff hours for the entire baseline period (2020-2030, EU28), based on input from ECSA in consultation with a group of shipping experts[93]. In a harmonised system with a single reporting entry point, less time will have to be spent on the reporting tasks and there will be no need to adapt the data set into different formats for each new port call.

The assumption for the benefit estimate is that gradually up to 90% of the shipping operators will choose to use the harmonised gateway (possibility that SMEs and national traffic operators opt to report in split data sets directly to national authorities – the 90% is already a cautious assumption). These staff hours saved – mainly by the qualified professional category of ship masters[94] – are equivalent to around EUR 720 million[95] expressed as present value in 2020[96]. Sensitivity analysis has been performed to take into account the uncertainty regarding the uptake of the voluntary new harmonised reporting format by also running the model with a lower uptake among shipping operators: gradually increasing up to only 80% of shipping operators using the harmonised reporting gateway. Assuming the more pessimistic uptake[97] over 2020-2030 is projected to lead to around 22 million staff hours saved, equivalent to EUR 625 million, expressed as present value in 2020. Therefore, **the total time saved is estimated at 22 to 25 million staff hours, equivalent to a value of EUR 625-720 million[98].**

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[93] Calculation based on assumptions developed in consultations with ECSA and their associated members: average reporting time / average time savings for different types of vessels in different types of traffic (50% expected time savings for fixed route traffic; 75% for tramp traffic). For details on methodology, see Annex 4

[94] A value of staff hour is estimated at 38.35 € according to ECSA.

[95] The impact assessment support study, based on 20 replies received through the consultations (survey and interviews), showed somewhat lower savings estimated at EUR 67-79 million per year. However, this is based on very few data points and not on a representative selection of respondents; however, it indicates some uncertainty around the numbers. Interviewees were selected with a view to represent different geographic areas and shipping company sizes and types; the respondents to the survey are however not selected at all, the invitation to the survey was circulated broadly. 20 respondents of the total 11 000 shipping operators in the EU are considered a statistically weak sample.

[96] Assuming a slow and gradual uptake from 25-90% over the baseline period with harmonisation benefits only available as from 2021 (>90% of shipping companies replied in consultations that they urgently want a harmonised reporting environment but it is still considered unlikely that 90% will adapt to the new formats from day one).

[97] For the pessimistic uptake, the rate considered is 10 percentage points lower relative to the central rate for each year.

[98] With UK excluded, the expected estimated time savings for the total period would be 21-24 million staff hours equivalent to a value of EUR 600-690 million.

The value of the time saved does not represent a direct cost saving for the shipping operators. It is unlikely that the reduced administrative burden can lead to actual cuts in staff costs; but it is an opportunity cost as a significant share of qualified labour staff hours will be released for other tasks.

Implementing efficient data sharing and application of the "reporting only once" principle (primarily: within same port; in longer term, sharing of static data between ports) would additionally benefit the maritime transport operators by reducing the number of data transactions and report submissions. This benefits especially SMEs and companies reporting manually via Graphic User Interface[99]. There is no quantifiable data accessible on the number of data elements currently asked more than once; this add-on benefit in burden reduction and time savings has therefore not been possible to monetise. The indirect efficiency gains of improved information flows are also non-quantifiable.

Options B1-C1 have an added benefit over option A1 in terms of accessibility: with the commonly developed front-end component/portal, language translation of e.g. the graphic user interface text and of helpdesk information will be available for all EU languages in all reporting gateways at the National Single Windows / the European reporting gateway to a more cost-efficient price (central once-only language translation for all).

Options A2, B2, C2

The total cost savings above are calculated on the assumption that the harmonised reporting gateway is indeed the *single* entry point for reporting. In a scenario where still a significant share of reporting is done separately and in parallel (options A2, B2, C2), the cost savings will be lower as the maritime transport operators will still require double reporting systems and more staff hours spent on reporting. This is not only an effect of two separate reporting systems with one clean-cut share of the data set each; the lower expected time saving is also an effect of the resulting double-reporting in a reporting environment without the inter-connection between customs and maritime reporting. Part of the data set is over-lapping between the two entities and data will continue to be sent in duplicate and in possibly different formats into the two reporting environments.

The assumption used, based on input from ECSA in consultation with a group of shipping experts, sets the expected time reduction per port call to only 20-25% in policy options A2-C2. This is substantially lower compared to expected reduction of 50-75% in the options with the possibility of customs and maritime reporting done together. For options A2-C2, the expected **total time saved would therefore be around 7-8 million staff hours over 2020-**

[99] EY and DTI for the European Commission, *Study on eGovernment and the Reduction of Administrative Burden*, 2014

2030 (EU28), equivalent to EUR 215-245 million, expressed as present value in 2020[100]. The same uptake rates are assumed as for options A1-C1.

	A1	*A2*	*B1*	*B2*	*C1*	*C2*
EU28						
Savings compared to baseline in million staff hours (baseline 50 million hours)	22-25	7-8	22-25	7-8	22-25	7-8
Savings compared to baseline, € million (present value) (baseline € 1,520 million)	625-720	215-245	625-720	215-245	625-720	215-245
Excluding UK						
Savings compared to baseline in million staff hours (baseline 48 million hours)	21-24	7-8	21-24	7-8	21-24	7-8
Savings compared to baseline, € million (present value) (baseline € 1,455 million)	600-690	205-235	600-690	205-235	600-690	205-235

Table 3: Reduced administrative burden for shipping operators relative to the baseline over 2020-2030

6.1.2. Costs: IT system investments and operational costs[101]

The main investment costs of evolving the current RFD system into a comprehensive and harmonised port call reporting environment is in the development and adaptation of IT solutions and IT infrastructure, including training of staff for the new gateway solution. With a fully interconnected and harmonised set-up there will also be a need for certain common features such as common/connected databases and registries for the reporting gateway(s). These costs will be primarily for the Member States and for the European Commission. In addition, there will be some adaptation costs for the back-end entities to enable connections to the updated and harmonised reporting environment.

The calculation of these costs is based on the average cost for *additional* adaptation of a currently implemented National Single Window to implement the new common gateway. Costs for finalising implementation of a National Single Window under the current RFD are not factored in for any of the policy options (as these costs are due regardless of any new proposal as part of the implementation of the current Directive; the vast majority of Member States already have a National Single Window in place). The costs for national authorities are therefore assumed to be largely similar across all Member States, with some individual differences based on e.g. salary levels and number of back-end authorities linked to their National Single Windows today.

In all options A-C, some adaptation of the current National Single Window systems will be required. In options A-B, the National Single Windows will need to be upgraded to a harmonised interface specification or updated to plug in a new front-end reporting gateway

[100] With UK excluded, the expected estimated time savings for the total period would be equivalent to EUR 205-235 million.

[101] For the cost estimates, data from the support study by COWI/Gartner has been used. More details on the methodology for cost estimates is in Annex 4.

solution; in option C, the National Single Window may also continue the current functions to be able to receive reporting directly from vessels in national traffic, but must also in any case be adapted to be able to connect to a central European reporting gateway. This implies changing some functionalities following the shift of responsibilities from national to EU level. The costs for developing the IT solutions is primarily on Member States in options A; on the EU in options B-C.

To minimise the shipping operators' adaptation costs, especially for ships in national traffic and for SMEs, Member States may decide to allow for shipping operators to continue reporting their maritime transport formalities either to the former National Single Window front-end interface (primarily relevant for option C) or directly to the back-end entities where it is so possible (to customs IT systems, port community systems, national authorities). The former case would entail duplication costs, e.g. on interface maintenance, that Member States may wish to avoid after a transition period. The latter case would not necessarily cause additional costs to the Member States. Note that the possibility to maintain the former National Single Window front-end does not imply that a Member State could "opt out" of the obligation to offer the new harmonised front-end interface.

As for shipping operators, there are no additional costs beyond the normal update and maintenance costs under current RFD. The adaptation costs for enabling plug-in to the new harmonised reporting system are not yet estimated; 68% of shipping operators replying in the consultations expect "low or some costs" and 13% expect "high costs" but no shipping company has been able to provide an estimate figure of these expected costs. Costs for shipping operators are also expected to differ depending on e.g. their current reporting systems (graphical user interface, machine-to-machine, non-digital, etc.). For the smaller companies applying graphic user interface, the cost can be zero as the harmonised spreadsheets will be provided as free templates for the new data formats. For machine-to-machine reporting there will be a smaller adaptation cost, depending on the current formats. In the consultations, the uniform view of shipping industry stakeholders was that any required investments will be outweighed by the benefits. The harmonisation also means there will only be one update for all EU reporting instead of the need to adapt and update reporting to match different and non-synchronised systems for each port.

The following IT system assumptions have been applied for the cost assessment by the Impact Assessment support study. The cost calculations have been done using a Fast Function Point Analysis; the full methodology and underlying assumptions are presented in Annex 4. For all policy options, the cost model includes the costs for back-end entity connections to the adapted National Single Windows.

- **For policy option A1**, most major costs for development, implementation and adaptation will be covered by the Member States. The Member State must translate the specifications of the EU legislation into a software, guaranteeing that all functionalities, interface aspects and data models follow the common set-up and that all rules and requirements are fulfilled to ensure quality information flows between the back-end entities (e.g. customs trader interfaces and reporting systems) and the front-end users (shipping operators). Annual maintenance and operational costs will

increase compared to the baseline cost (approximate average EUR 265 000 per Member State and year), due to the expansion of the system.

For the Commission or the entity assigned this task, there will also be costs for developing and maintaining the common infrastructure, e.g. common databases and registries; and to develop the technical specifications. EU-level costs will also be incurred for the connections with some central back-end systems. The annual update and management costs will cover e.g. helpdesk function towards the Member States, stakeholder management (governance mechanism); specifications updates (reflecting and following any developments in the underlying legal acts) and the maintenance of the common databases and registries.

- **For policy option A2,** the same functions and related costs as in option A1 apply. However, there are fewer connected entities (customs IT systems not interconnected), lower complexity of requirements/specifications and lower volume of messages to be transmitted without the direct connections with customs IT systems. The costs for option A2 are therefore lower than in option A1.
- **For policy option B1**, the cost for Member States' one-off investments will be substantially lower than in option A1 since the IT development cost is covered by the EU with economy of scale gains. The Member States will have some investment costs for ensuring the first plug-in of the common front-end interface solution as new reporting gateway to the National Single Windows, but the functionalities of the National Single Windows beyond the front-end can remain more or less unchanged. As in option A1, Member States will face some additional annual maintenance and operational costs caused by the expansion of the system, in addition to the baseline cost of running the National Single Windows.

  The entity assigned by the Commission (delegation of the task highly likely; the work must be done by an entity with sufficient know-how of IT system development with EU eGovernment principles in mind and with sufficient expertise of the specific reporting requirements and linked procedures) will manage development and production of the front-end component IT solution and the common specifications. This will relieve some of the cost burden from Member States as the main IT development task is centralised. The front-end solution must be developed with the current National Single Windows in mind, creating a plug-in solution possible to adopt in all National Single Windows with minimum extra cost for Member States. In addition, the EU responsible entity would have costs for the common services such as databases, central helpdesk function (towards Member States) and stakeholder management (governance mechanism); these costs will be substantially higher for the EU in option B1 than in option A1 as more services are provided to the Member State.
- **For policy option B2**, the fewer connected entities, lower complexity of requirements/specifications and lower volume of messages results in lower costs than in option B1.

- **For policy option C1,** Member States will need to perform updates of their receiving end systems; these costs are estimated to be slightly higher than the baseline costs of annual maintenance of the current system due to the new higher pressure for synchronised updates to legal and technical developments. In addition to maintaining the current front-end to be able to process data received directly from vessels in national traffic (if the Member State decides to do so), the National Single Windows also need to be adapted to be compatible with the central level gateway. They will need to be slightly transformed as some functionalities are moved from national to EU level and a routing function is instead added in the National Single Window. These more complex functionality adaptations imply a higher investment cost for Member States in adapting the National Single Windows, as compared with option B1. Some additional annual maintenance and operational costs are expected on top of the baseline cost for National Single Window operation due to the expanded volume of messages passing via the window and the stronger demand for timely updates whenever the centralised gateway is updated.

  The cost of development and operation of the centralised solution and the new EU-level reporting gateway and routing system will be for the EU Commission budget; including helpdesk functions towards Member States, regular software updates and risk mitigation measures to ensure high availability and high security of the system. The development costs for the Commission for the full IT system at central level (building from zero) is still slightly lower than the cost of developing a front-end solution fit to plug into all existing National Single Windows as is required in options B1-B2 while the annual maintenance cost in option C is higher.

  For policy option C2, the fewer connected entities, lower complexity of requirements/specifications and lower volume of messages results in lower costs than in option C1.

Regarding the costs for data re-use, there will be no need to establish additional systems for this since there are already working solutions (like SafeSeaNet) or planned developments (like ICS2 for customs) for 'administration to administration' exchanges. The added value of data re-use can therefore be achieved at little or no cost. There may in any case be a need for existing authority IT systems to be updated to be in line with the new General Data Protection Regulation coming into force in May 2018. The data sharing within the European Maritime Single Window environment will need to respect these rules, just like all other information flows will. Any IT solutions or business rules being prepared under the new initiative will also ensure data protection by design and by default.

		Baseline	A1	A2	B1	B2	C1	C2
EU28								
Costs for the Member States (€ million, present value)	CapEx	-	13,5	10,7	7,8	7,1	10,7[102]	10,7[103]
	OpEx[104]	108	14,3	11,0	8,1	6,8	8,1	8,1
	Total MS	*108*	*27,8*	*21,7*	*15,8*	*13,9*	*18,8*	*18,8*
Costs for the EU (European Commission or other entity assigned with the task) (€ million, present value)	CapEx	-	1,7	1,7	2,5	2,5	2,4	2,4
	OpEx	-	9,6	9,6	11,0	10,9	13,0	12,0
	Total EU	-	*11,3*	*11,3*	*13,5*	*13,3*	*15,4*	*14,4*
Total costs (€ million, present value)		**108**	**39,1**	**33,0**	**29,4**	**27,2**	**34,2**	**33,2**
Excluding UK								
Costs for the Member States (€ million, present value)	CapEx	-	12,9	10,2	7,5	6,8	10,2[105]	10,2[106]
	OpEx[107]	104	13,7	10,5	7,8	6,6	7,8	7,8
	Total MS	*104*	*26,6*	*20,7*	*15,2*	*13,4*	*18,0*	*18,0*
Costs for the EU (European Commission or other entity assigned with the task) (€ million, present value)	CapEx	-	1,7	1,7	2,5	2,5	2,4	2,4
	OpEx	-	9,6	9,6	11,0	10,9	13,0	12,0
	Total EU	-	*11,3*	*11,3*	*13,5*	*13,3*	*15,4*	*14,4*
Total costs (€ million, present value)		**104**	**37.9**	**32,0**	**28,7**	**26,7**	**33,4**	**32,4**

Table 4: Investment/adaptation and operational costs (total period 2020-2030, EUR million, present value); 4% Better Regulation discount rate applies.

6.2. SME impacts

6.2.1. Benefits

SMEs will benefit to a high degree especially from reduced administrative burden and more efficient interactions with authorities (data re-use, single entry point, rationalisation of duplicate or redundant reporting): SMEs generally have limited resources and are less likely to have the IT systems for machine-to-machine reporting. They are therefore more likely to be in the higher end of average reporting burden per port call today. Furthermore, in small companies every staff hour saved makes a proportionally bigger difference than for large companies with bigger on-board crew.

[102] This cost includes a cautious assumption of all Member States maintaining the current front-end gateway as an option for vessels in domestic traffic; in a scenario with no Member State providing this offer the total cost would be EUR 3 million lower (7.7)

[103] Idem

[104] In addition to the Member States' baseline cost for annual operation of the current National Single Windows; those costs also remain in all options.

[105] As in the C1 scenario for EU28 (7.2 million)

[106] As in the C2 scenario for EU28 (7.2 million)

[107] In addition to the Member States' baseline cost for annual operation of the current National Single Windows; those costs also remain in all options.

In the targeted interviews, SMEs especially pointed to their expected benefits from clarified data re-use principles and data rules including regarding the use of potentially personal data. The consulted SMEs stressed that they struggle to integrate the requirements of the complex GDPR in their business models. Especially SME shipping companies and ship agents mentioned this in the interviews, stressing that they have limited resources to put in place the right IT infrastructure to ensure GDPR compliance.

Data is not sufficiently available to calculate a separate benefit quota for SMEs.

6.2.2. Costs

Adaptation costs for SMEs and other shipping companies would be negligible or in size of the normal regular updates under the current RFD, notably since the harmonised new reporting entry point is offered and not a mandatory system. No additional costs are therefore forced on SMEs.

6.3. Social impacts

6.3.1. Benefits

The direct effect is notably the decrease in cumbersome and repetitive work tasks for the shipping operators, notably the ship masters. In the consultations, such tasks were pointed out by social partners as a very negative side-effect of the inefficient reporting environment. 70% of all respondents expect positive or strongly positive impact on overall job quality from harmonisation options A and B; 90% expect positive or strongly positive impact from harmonisation option C. No single respondent expect negative impacts on job quality from either option. Ship masters are highly qualified professionals with long education for navigation; it is considered a particular waste of skills to spend their high-cost staff hours on burdensome bureaucracy. In a situation where the maritime transport sector finds it increasingly difficult to recruit competent and qualified staff[108], actions to make the maritime profession more attractive by reduced administrative burden would therefore be highly welcome. Harmonisation of reporting will ease this burden; single reporting entry point for customs and maritime reporting; reporting-only-once and continued improvement of data flows and possibilities of more machine-to-machine reporting offer further benefits in this regard. The value of this social benefit cannot be easily monetised and quantified.

Apart from job satisfaction and quality of work, several stakeholders in the consultations have stressed the indirect expected benefit on safety levels. It is commonly expected that the released staff hours will to a large extent be shifted to safety related tasks, especially when the ship master can spend his time at the bridge instead of with the excel sheets. This is particularly important since much of the reporting requirements are due at the time a ship

[108] https://ec.europa.eu/transport/modes/maritime/seafarers_en

enters the port; so at the peak activity of a ship journey when the attention of the ship master would be most needed at the bridge.

6.3.2. Costs

Any indirect negative social impact is primarily expected for shipping agents. With simplified reporting procedures, some shipping operators may no longer need shipping agent services in their current format. For this group of stakeholders, tasks and business opportunities will transform and jobs may disappear. It is impossible to make a credible estimate of this impact; since ship agents themselves primarily expect their services may be transformed rather than made redundant[109] and since the over-all shipping volumes may at the same time increase, balancing out some of the potential negative impacts.

6.4. Environmental impacts

6.4.1. Benefits

The modelling performed with the PRIMES-TREMOVE and TRUST models[110] show that policy options A1-C1 would shift 3,395 million tonne-kilometres to waterborne transport in 2030, mostly away from road, because of improved competitiveness of the sector (i.e. lower administrative burden relative to the baseline). This represents about 0.3% increase in the transport activity of the waterborne transport in 2030 relative to the baseline. The shift in traffic towards waterborne transport would also have an environmental impact in terms of reduced greenhouse gas emissions. Over the 2020-2030 horizon, freight transport emissions are estimated to decrease by 1,880 thousand tonnes of CO_2 (0.1% decrease) relative to the baseline. This translates into around €145 million of external costs savings over 2020-2030, expressed as present value. The impacts of policy options A2-C2 would be more limited, due to the lower reduction in administrative burden relative to the baseline: 1,185 million tonne-kilometres shifted to waterborne transport in 2030 (mostly away from road); 630 thousand

[109] Expected impact according to the European association for ship agents, ECASBA: job transformation and higher efficiency primarily; low employment impact. From the case study interviews: "Ship agents are confident about the demand for their services independently of the status of the NSW in which they work in. They believe they will benefit from harmonisation and digitalisation independently of how large a share of their business currently relies on handling reporting formalities".

[110] The modelling has been performed by ICCS-E3MLab and TRT. The PRIMES-TREMOVE transport model and the TRUST model have been used to assess the impacts on modal shift and environmental impacts. The time savings for the shipping operators in the policy options relative to the Baseline have been used to calculate the impacts on the generalised transport costs by origin-destination with the TRUST model. The changes in the generalised transport costs have been subsequently used in PRIMES-TREMOVE to derive the impacts on modal shares for all freight transport modes together with their impacts on CO_2 emissions. The time savings assumed for quantifying the impacts on modal shift and CO2 emissions are the same as those used for assessing the reduced administrative burden. More details about the inputs used and the modelling setup is provided in Annex 4.

tonnes of CO_2 saved relative to the baseline over 2020-2030, equivalent to external costs savings of around €48 million (expressed as present value).

In the case studies, it was mentioned that in some Mediterranean and Black Sea ports, ships may wait even days outside a port with engines running, due to congestion which could at least partly be relieved by better data handling and data flows to and from authorities. In the consultations, deep sea shipping operators mentioned that with less time spent in port or more accurate port availability information, they could adjust speed to go slower, thereby saving fuel and emissions. These impacts are non-quantifiable because of lack of detailed data.

6.4.2. Costs

No negative environmental impacts have been suggested or identified.

6.5. Other impacts

More efficient procedures will also have indirect unquantifiable benefits for maritime transport operators. The consequence of the more harmonised and simplified reporting would be **improved competitiveness** for the maritime transport sector, as shipping operators can spend more time and effort on business related matters instead of on reporting; also costs for ship agents may to some extent be saved. This could indirectly benefit business results, GDP growth and prices for consumers.

In addition, the potential benefits of National Single Windows will increase if the digital information received is efficiently re-used for **improving maritime transport and related multimodal and logistic services**. For example, a harmonised provision and efficient and appropriate re-use of arrival or departure times could enable transport and logistics service providers to optimise the flow of cargo in and out of ports in real-time. This would in turn facilitate the establishment of more efficient and environmentally-friendly transport and logistics services for all users. These indirect effects have not been possible to quantify.

Member States, ports and other authorities are expected to experience less tangible benefits from improved data sharing and re-use; although in the long run the investments in such data flow systems may have beneficial indirect effects on over-all efficiency gains and **enabling new quality services**; Member States are also expected to benefit qualitatively from **better information exchanges** and information flows between authorities nationally and cross-border.

Digital reporting offers a large potential to improve the efficiency and reliability of reporting process but also requires close attention from the point of view of concerns and risks related to the security of the digital reporting and wireless communication systems. Cybersecurity and privacy technologies should become complementary enablers of the EU digital economy, ensuring a trusted networked ICT environment for governments, businesses and individuals. The EU ambition is to become a world leader in a **secure digital economy**.

The prevention of and the protection against attacks that target modern ICT components, complex ICT infrastructures, and emerging technologies as well as ensuring continued operation or redundancy remains a difficult task. This concern applies to all considered options. Whichever option is chosen, it should be guaranteed that the adopted system will

remain open to the continued evolution of **innovative solutions** that will help to achieve a well-functioning, harmonised, secure and future-proof digital reporting environment enabling interconnectivity and coordination of transport and customs related reporting, to improve the efficiency attractiveness and environmental sustainability of maritime transport while also contributing to the more efficient integration of the sector within digital multimodal logistic chains. It should aim for **technology neutrality**, and seek to avoid lock-in to one particular technology solution or technique that may change in future. Also the automation and technical developments in ships are expected to have a significant impact (see above, chapter 2.4).

7. HOW DO THE OPTIONS COMPARE?

7.1. Stakeholder preferences

Views among stakeholder groups differ substantially when it comes to the policy options for harmonisation. Among shipping companies and ship agents, the strong preference is for greatest possible harmonisation; the largest share (43%) supported option C. They have not shared strong objections against any option except status quo. Member States on the other hand have, in interviews and consultation events, **voiced strong objections against a centralised approach**. Among Member States, the preferred options are instead option A (40%) and option B (30%). Ports and port community system providers have been mostly in favour of discarded option D (31%) followed by option A (25%); however, these stakeholders are neither primarily affected by the problem or by the solution (no high cost of new legal obligations).

It should be noted that in the consultations, no estimates on costs and benefits were yet ready and provided to stakeholders; the choices were made on the basis of other considerations. To be able to take the differing views properly into account, the underlying reasons for the stakeholder group choices were considered.

The different preferences reflect the main interests of these groups. Shipping operators want to remove the administrative burden. Member States have stressed their interest in protecting their previous investments in National Single Windows. Ports and port community systems have no specific disadvantages in the current non-harmonised situation and are less concerned about change.

For Member States in particular it seems to be a political choice more than a preference based on cost calculations. There is reluctance to accept a new layer of structures between the National Single Window and the shipping operators and a desire to maintain a degree of control over the operation of the reporting gateways. There is also a high awareness of the potential risk of a single point of failure with high impact on port operations in case the central reporting gateway fails.

Shipping operators' interest in a centralised system seems to be based on distrust in Member States' capacity to achieve harmonisation when in charge of building their own systems. Therefore, options B1-B2 represent a compromise option whereby Members States would retain control on the operation of the reporting gateway, while stakeholders' distrust could be

appeased by guaranteeing a harmonised front-end gateway/interface developed at EU level and delivered to all Member States.

Regarding the scope of the requirements, shipping operators and ship agents strongly prefer a comprehensive scope including all national requirements (96% of shipping companies, 82% of ship agents) and all cargo reporting (93% of shipping companies, 85% of ship agents) via the European Maritime Single Window environment; this is less of a priority for Member States (52% supporting national requirement inclusion; 79% supporting inclusion of customs formalities) and port operators (91% support inclusion of national requirement; 71% inclusion of customs formalities).

For back-end entities, options A1-A2 are expected to be more attractive, giving better possibility of synchronisation of national level requirements. This would however be a potential trade-off at the expense of harmonisation towards the shipping operators (lower benefits achieved).

7.2. Effectiveness

For policy option A1-A2, the responsibility for interpretation and implementation of the common specifications lies fully on Member States. The likelihood of reaching the objective of a fully harmonised reporting environment is therefore lower – differences in interpretation are likely to result in some fragmentation still of the systems, even if the main functionalities work in the same way everywhere. The high risk of non-synchronisation (Member States likely to have different cycles for updates and different speed of implementation and maintenance) also reduces the expected effectiveness of the option. The expected effectiveness towards the objective of harmonisation is therefore lower with option A than with options B-C.

For policy option B1-B2, responsibility for interpretation of the specifications is with the EU-level entity in charge of the common reporting gateway IT solution, ensuring that the harmonisation objective can be effectively reached. The timely installation and running of this IT component is then the responsibility of the Member States. Effectiveness may decrease if Member States fail to update timely and in accordance with instruction by the responsible EU-level entity. Overall, however the options B1-B2 are expected to deliver reliable and sufficient achievement of the harmonisation goals.

For policy option C1-C2, the expected effectiveness of harmonisation is high: a single entry point will by nature provide the fully harmonised reporting environment.

Policy options A1, B1 and C1 are all expected to deliver high effectiveness towards the single entry point objective; slightly lower however for option A1 due to the likelihood of national level differences in the interpretation of technical specifications. The objective of efficient data sharing and data re-use will also be more effectively achieved in a fully integrated reporting environment. In **policy options A2, B2 and C2** however the single entry point objective will not be completely achieved as maritime and customs reporting will not be fully integrated; this also affects the effectiveness towards data re-use and "reporting only once".

Beyond the direct effects and objectives, **all options** will contribute to the general objective of the smooth functioning of the Single Market; the simplification, digitalisation and reduced burden on economic operators is expected to benefit the overall EU objectives by supporting more efficient trade and transport and thereby growth, competitiveness and employment.

Compared to Baseline	A1	A2	B1	B2	C1	C2
Specific objective: To harmonise reporting procedures, interfaces and data formats	+	+	++	++	+++	+++
Specific objective: To reduce administrative burden through single entry point for reporting	++	+	+++	+	+++	++
Specific objective: To increase efficiency by enabling reporting only once	+++	++	+++	++	+++	++
General objective: To contribute to the smooth functioning of the Single Market by facilitating trade and transport	++	+	+++	++	+++	++

7.3. Cost-efficiency

The Impact assessment support study found that for the costs calculated, even an average time saving of five minutes per port call would lead to benefits matching the costs[111]. The expected time savings are substantially higher than this figure for all options even with the cautious estimate ranges and the assumption of a slow and gradual uptake; the cost-benefit ratio is clearly positive for all analysed options.

(EU28)	A1	A2	B1	B2	C1	C2
Benefit: estimated value of staff hours saved compared to baseline	625-720	215-245	**625-720**	215-245	625-720	215-245
Costs: total estimated additional costs for MS and COM (on top of baseline costs EUR 108 million for the time period)	39.1	33.0	**29.4**	27.2	34.2	33.2
Cost-benefit ratio	16.0-18.5	6.5-7.5	**21.3-24.6**	7.9-9.1	18.3-21.1	6.4-7.4

[111] COWI, *Support study for the impact assessment of a European Maritime Single Window environment*, 2018

The costs are higher in options A1, B1 and C1 but the benefits for shipping operators are also considerably higher. Options A2, B2 and C2 are less costly and easier to implement and maintain but less ambitious in terms of achieving benefits and with subsequently lower cost-benefit ratio.

The ranking of options cost-wise remains the same even if we make the assumption that no Member State decides to offer the current reporting gateway as an option for vessels in national traffic (up to 3 million lower costs for Member States in total). The difference between options B and options C will be marginal.

Options A1-A2 have less certainty of achieving the benefits (interpretation of the technical specifications is done by the Member States; unlikely to result in permanently identical reporting interfaces although main functionalities should be similar) and incur the highest costs for the Member States. Options B1-B2 is the least costly, in particular for Member States, and yields high certainty of benefits for the shipping operators due to a better control on EU level harmonisation than with options A1-A2. Options C1-C2 have higher costs, but, as options B1-B2, provides high certainty of benefits. It should however be noted that the differences in total costs for the period of 2020-2030 are very low (EUR 11.9 million between the most expensive and the cheapest options) and the cost-benefit ratio high for all options and in particular for all comprehensive scope options.

The option with highest cost-benefit ratio is option B1 (second cheapest option).

7.4. Coherence

All options are in coherence with other EU policy objectives.

The objectives of the proposal are in coherence with EU transport policy in general and maritime transport policy in particular. The initiative supports EU policy on reducing emissions from the transport sector and contributes to the objectives of the EU transport social agenda. It remains well coherent with the Vessel Traffic Monitoring and Information Systems Directive and brings added value by enabling coordination of the reporting requirements under the reference legal acts. The governance mechanism established in all options provides a guarantee that changes in underlying legislation will be appropriately and timely mirrored in the technical data set and with required updates for specifications and IT component.

All assessed options are in line with the Commission REFIT programme objectives of administrative burden reduction and simplification and with the overall Commission objectives of competitiveness, smoothly functioning internal market and digitalisation.

The proposal is in coherence and closely aligned with the implementation of the Union Customs Code. Options A1-C1 create a closer interconnection between the maritime and customs policy areas requiring more efforts for cooperation and harmonisation between the services. This creates a higher level of complexity but also opportunities for increased coherence with benefits for external stakeholders.

The proposal complements also the initiative on electronic freight transport information concerning acceptance in digital format of freight transport related information and certificates by authorities performing transport-related inspections in the EU hinterland. Just

like the e-Documents initiative, the European Maritime Single Window environment will support digitalisation and simplification for transport operators; although the two initiatives address different aspects of information reporting requirements at different stages in the course of a freight transport operation. The two proposals have been developed with particular care to exploit synergies with regards to data interoperability aspects.

None of the options will create contradictions with existing EU acquis.

7.5. Proportionality

The options are designed not to impose any disproportionate burden on the shipping operators, notably by offering the harmonised European Maritime Single Window environment as non-mandatory for shipping operators. By building on the existing structure of National Single Windows, costs to Member States are limited and clearly exceeded by the potential direct and indirect benefits.

Options C1 and C2 creates an additional EU-level layer between the shipping operators and Member State authorities, creating a new structure for reporting. However, even these centralised option would be justifiable with respect to the benefits it would bring in terms of reduced administrative burden.

None of the options therefore go beyond what is necessary to achieve the objectives. The expected high efficiency gains cannot be achieved by action only on Member State or international level nor by other, non-legislative means. The proposed expansion of the scope is well defended by the benefits expected. New reporting requirements are not created but existing requirements are brought into a coordination mechanism.

To achieve the objectives, a Regulation replacing the current RFD is proposed as the adequate instrument.

7.6. Summary: comparison of options

The preferences for different options differ widely between the stakeholder groups. While options B1-B2 are not the first choice of any stakeholder group, it could present a suitable compromise option for all main stakeholder categories, considering especially that the acceptance for option C1-C2 is low among Member States. The compromise option should provide sufficient guarantees of harmonised front-ends to be supported also by the shipping operators when adopted. None of the other options present a realistic compromise with possibility of being supported by all main groups.

The options B1-C1 have highest expected effectiveness, addressing all problem drivers and most likely to produce complete harmonisation of the front-end interfaces/gateways and data formats. These options are more likely to facilitate also the data re-use/data sharing issue, as compared to the limited scope options.

While option B2 would be cheaper to implement, it would also yield substantially lower benefits for the shipping operators (trade-off). All options will result in unbalanced outcomes

for the different stakeholder groups: the costs incurred will be primarily for Member States and the Commission whereas the direct benefits will be reaped by the maritime transport industry. Indirectly, this will however benefit the entire Union objectives in terms of more efficient trade and transport, beneficial for overall growth, competitiveness and employment.

In terms of cost-benefit ratio, the options A1-C1 score higher than options A2-C2 with best ratio for option B1. The cost-benefit results remain clearly positive also when testing the options for the assessed uncertainty of cost and benefit estimates (e.g. calculating benefits in a more pessimistic uptake scenario). The costs are however very similar across all options and the cost aspect alone is not sufficiently decisive to argue strongly for one option over the others.

The risk of system failure is lower in a distributed system, as in options A1-A2 and B1-B2. These options have higher resilience against e.g. cyber-attacks or technical break-down. The likelihood of all National Single Windows breaking down at the same time is considered low. Options C1-C2 on the other hand have a higher vulnerability because of the "single point of failure" (low resilience to cyber security, technical failures; high impact in case of failure) which would require solid back-up measures to mitigate the risk, e.g. by transfer of risk (managed hosting) or measures to lower potential impacts (business continuity facility). On the other hand, implementation related risk is higher in options A1-A2 and B1-B2 if not all MS have the capacity to properly apply the specifications and/or common software. The main risk in this regard is the non-synchronisation and failure by Member States to update their National Single Windows timely to new specifications, notably in options A1-A2 where all developments must be completed at Member State level. This risk remains even with a Regulation as legal instrument as specifications will be updated by delegated/implementing act. There is also a higher risk in A1-A2 and B1-B2 that there is no or an insufficient common knowledge base for the help-desk, resulting in heterogeneous quality of help-desk towards the data providers and back-end connected entities.

	Effectiveness	Efficiency	Coherence	Proportionality
Baseline	0	0	0	0
Option A1	++	++	+++	+++
Option A2	+	+	+++	+++
Option B1	+++	+++	+++	+++
Option B2	++	+	+++	+++
Option C1	+++	+++	+++	++
Option C2	++	+	+++	++

8. PREFERRED OPTION

The preferred option, based on a combined analysis of cost-benefit ratio, acceptance by stakeholders and expected effectiveness, proportionality and risk rating, is therefore **option B1** with a total expected additional cost of EUR 29.4 million for 2020-2030 and expected new benefits of 22-25 million saved staff hours for the same time period (equivalent to a value of EUR 625-720 million). This option yields the highest benefit to an acceptable cost. It will ensure a harmonised reporting environment while respecting the current set-up of National Single Windows, therefore exploiting the already made investments. It can realistically receive the support of all main stakeholder groups. The burden on Member States is minimised by offering a common software developed at EU level and it avoids the risks attached to creating an additional layer of architecture (including by ensuring proportionality of the proposal) and reduces the risks deriving form single point of failure.

The option will have budget implications for the European Commission, with expected costs for IT services and IT system development up to **EUR 13.5 million** in the period of eleven years 2020-2030. The Commission costs are proposed to be covered via *Support activities to the European transport policy and passenger rights including communication activities* (budget reference 06.02.05).

In this, as in the other options, delegation of the IT development tasks is likely to be needed. The main project management will remain with the Commission services but it is probable that some IT development services will need to be provided by external contractors or specialised entities. Commission specialised services and decentralised agencies with expert know-how of IT system development (including EU eGovernment principles) and the specific maritime transport reporting requirements and linked procedures will need to be involved as appropriate. Expertise from several services may need to be involved in the project management and governance mechanism, e.g. to ensure coordination with all connected policy areas (underlying legal acts). The detailed task division including contracting of IT development services should be defined in connection to the development of work plans in line with delegated/implementing acts.

The governance mechanism required is a set of implementing/delegated powers to enable necessary updates in line with legal and technical updates; and a dedicated expert group in coordination with all relevant Commission services.

9. REFIT (SIMPLIFICATION AND IMPROVED EFFICIENCY)

The preferred option offers significant simplification and improved efficiency by reducing the administrative burden for shipping operators fulfilling legal requirements in connection to a port call.

The reduced administrative burden is expected to be achieved as the result of 1) harmonised front-end reporting gateways, procedures and data formats; 2) the provision of a single reporting entry point; 3) more efficient re-use of data enabling reporting only once and removal of duplicate reporting. With a comprehensive coordination mechanism for all port-call related reporting for a shipping operator, in combination with fully harmonised data

formats, reporting procedures and front-end interfaces, a high number of staff hours can be spent on other tasks, notably related to core business, to safety and security.

REFIT Cost Savings – **Preferred Option: B1**		
Description	Amount	Comments
Time saved on port call reporting: total for all EU port calls over the baseline period 2020-2030.	**22-25 million staff hours in the time period 2020-2030; equivalent to a value of EUR 625-720 million**	Major benefit for maritime transport operators (shipping operators); indirect benefits for competitiveness and modal shift. Costs primarily for the Commission and for Member States authorities.

10. HOW WILL ACTUAL IMPACTS BE MONITORED AND EVALUATED?

The Commission will follow the progress, the impacts and results of this initiative by a set of monitoring / evaluation mechanisms. Progress will be measured towards achieving the specific objectives of the new proposal. With more clear and detailed specifications in the new legal framework and with more support to Member States for implementation (notably: by providing the common front-end plug-on solution), the expected implementation rate is substantially higher than for the current RFD.

The basis for **monitoring progress** will by necessity be the assessments and reports by the affected stakeholders (Member States, shipping operators). Static data on baseline issues such as number of port calls and number of reported data elements per port call can be automatically extracted from the IT systems; this will however only give context information and not proof of achievement of the proposal objectives. The stakeholders' assessments and replies will be carefully analysed and may be followed-up if needed with additional questionnaires or fact-finding activities.

Requests for information (reports, survey replies) must be carefully balanced not to cause additional burden on the stakeholders by creating disproportionate new reporting requests. It could be considered to develop a survey for regular consultation of stakeholders e.g. every two years following implementation. Specific monitoring of Member States' implementation will also be done within the normal procedures for follow-up of legislation implementation, including the launch of infringement procedures in case needed.

The progress indicators will show development over time, with the aim of reaching 100% success rate for each indicator. However, the main usefulness of the progress indicators is to identify areas or Member States where developments are slower, in order to set in appropriate countermeasures and support measures (e.g. training, guidance, technical assistance).

Five years after the end of the implementation date of the legal proposal, the Commission will also **initiate an evaluation** to verify whether the objectives of the initiative have been reached, based on the first Member States reports and on the first surveys and other inputs (e.g. complaints submitted) from shipping operators. The aim is to determine whether the new measures in place have improved the situation. Subsequently, the evaluation will inform

future decision-making processes to ensure necessary adjustments for reaching the set objectives.

Specific objective	Operational objectives	Progress indicator	Success criteria	Data sources
To harmonise reporting procedures, interfaces and data formats	• Establish technical data set with harmonised data formats • Develop and implement common harmonised software for the Nation Single Windows	• Data set established • % of Member States having installed the harmonised reporting gateway software (synchronised, updated version) over total (Ref: Total number of MSs) • % reduction in time required for reporting per port call over total (Ref: Average time per port call)	• Data set agreed by the expert group • 90-100% of Member States installed the reporting gateway by implementation deadline • 50% reduction in reporting time per port call for vessels in fixed route traffic; 75% reduction in reporting time per port call for tramp traffic vessels by 5 years after implementation deadline	Member States reports; surveys to shipping operators; number of complaints by shipping operators regarding access to harmonised reporting gateway; number of on-going infringement procedures against Member States for non-implementation
To reduce administrative burden through single entry point for reporting	• Reduce data elements requested outside the harmonised European Maritime Single Window environment for maritime transport	• % of data elements requested outside the harmonised European Maritime Single Window environment over total. (Ref: Total number of data elements as mapped by Part C	• 0-5% of data elements are requested separately.	Member States reports; survey to shipping operators

		group and eManifest group today)		
To increase efficiency by enabling reporting only once	• Reduce static data elements reported more than once	• % of static data elements requested more than once for a port call over total (Ref: Total number of data elements requested in a port) • % of static data elements requested more than once within the EU (Ref: Total number of data elements requested in the EU)	• 0-10% of static data elements are requested more than once in the same port call • 0-20% of static data elements are requested more than once beyond the same port, within the EU	Member States reports; Survey to shipping operators

Annex 1: Procedural information

Lead DG, D*e*cide Planning/CWP references

The lead DG is DG MOVE, Unit D1: Maritime Transport and Logistics

DECIDE reference number: PLAN/2017/1050

Item 5 in Annex II to Commission Work Programme 2018: An agenda for a more united, stronger and more democratic Europe[112].

Organisation and timing

The impact assessment follows the ex-post evaluation on the Reporting Formalities Directive performed as part of the overall maritime transport policy fitness check in 2016-2017.

The impact assessment started in 2017, with the first meeting of the Inter-Service Steering Group on 27 July 2017 and an inception impact assessment subsequently published on 28 July 2017[113]. Eleven respondents submitted public feedback on the inception impact assessment (see Annex: consultation synopsis report).

The Commission launched a call for tenders for a support study on "External Impact Assessment support study on establishing European Maritime Single Window environment". A contract was signed with a consortium of Ecorys/COWI under contract reference MOVE/DDG2.D1/FV-2017-271 implementing Framework contract No MOVE/A3/119-2013/LOT4. The support study was performed 2017-2018.

The Inter-Service Steering Group met four times and was consulted throughout the different steps of the impact assessment process: notably on the Inception Impact Assessment, on the ToRs and call for tender for support study, on the consultation documents and on the draft IA report.

The Commission Services participating in the ISG are: Secretariat-General, DG Maritime Affairs and Fisheries, DG Taxation and Customs Union, DG for Communications Networks, Content and Technology, DG Budget, DG Climate Action, DG Research & Innovation, DG European Commission Humanitarian Aid & Civil Protection (ECHO), DG Migration and Home Affairs, DG for Employment, Social Affairs and Inclusion, DG Industry,

[112] COM(2017) 650 final
[113] https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-3807523_en

Entrepreneurship and SMEs, DG Environment, DG Health and Food Safety and the European Maritime Safety Agency (EMSA).

Consultation of the RSB

The draft report was submitted to the RSB on 14 February 2017 and was discussed by the Board on 7 March 2018. The Board issued a negative opinion on 9 March 2018. The Board made several recommendations. These have been addressed in the revised Impact Assessment report as detailed in the table below. This revised impact assessment report was re-submitted to the Regulatory Scrutiny Board on 13 March 2018.

RSB recommendations	Modification of the IA report
Main considerations	
The report does not sufficiently explain the options, including key design aspects, implementation modalities and material differences. As a result, the presented cost differences between options are hard to understand.	The text has been significantly revised to provide more information on the description and design of options; on the assumptions made for these design choices; on the technical functionalities of each option and how they impact on the current National Single Windows, and therefore also how they impact the cost calculations for each option. More information on cost assumptions has been submitted by the support study team and included into Annex 4. Clearer language has been adopted to make it easier for readers to distinguish between the new/changed functionalities proposed (front-end reporting gateway) and the functionalities remaining untouched (National Single Windows role in data distribution towards the back-end connections). See in particular extensive redrafting in chapters 5, 6, 7 and 8 and new information added in Annex 4.
The report does not adequately present stakeholders' views. These views appear central to selecting the preferred option, as the	The text has been updated notably in sections 7.1 and 7.6 to more clearly explain the concern not only with the preferences of

report's evidence of costs and benefits do not clearly favour this option.	stakeholders but also with the resistance of stakeholders against certain options and the analysis of underlying reasoning by stakeholders, leading to conclusions about possibility of a compromise option. The missing information has also been added in Annex 2: consultation synopsis report (this annex has also been shortened due to translation requirements).
Further considerations	
The report needs to provide a more comprehensive overview of existing reporting systems, including a description of how they serve different vessel types and different purposes. The report should explain why it is necessary to maintain alternative reporting systems in parallel with the European Maritime Single Window (EMSW).	The report has been revised to provide more information on the current and new reporting scopes and their purposes. Clarifications have been made to better explain the rationale for not making the harmonised reporting gateway mandatory for operators and what this means in practice under the different options. See in particular sections 2.2, 5.2, 6.1.2 and Annex 5.
The report should more clearly define the problem and the problem drivers. The evaluation concludes that the NSWs do not deliver on the current directive's objectives. On the basis of the evaluation results, the report should clarify whether the issue is the current legal framework, deficits in implementation or the poor workings of the NSWs. The report should reconsider to what extent the need for data re-use between port calls can be justified by the (limited) reporting costs for operators, once reporting is harmonised. It seems that the need for data re-use is more driven by efficiency gains for the authorities and the possibilities for more effective controls. The report should give the reasons why the baseline expects that current problems will persist.	The description of problem drivers has been expanded and the role of the current legislation and its implementation is clarified (implementation of the current Directive will not solve any of the main problem drivers and is therefore not a sufficient solution; the key conclusion of the evaluation was the shortcoming of the RFD in terms of lack of clear provisions which can only be addressed by legal amendment). The data re-use aspects have been specified and presented more clearly and the baseline lack of harmonisation has been more directly explained. The reason why the problems are highly unlikely to disappear in the baseline scenario is described in more clear words. See chapters 1, 2.1, 4.2, 5.2, 5.3, 6.1.1 and

	6.1.2.
The report is unclear about key design aspects of the options. As a result, it is not clear how they would work. The report needs a stronger presentation of the differences between the options, especially with regard to how they would co-exist with existing NSWs and other reporting channels. It should detail the functional differences between a harmonized interface for the NSWs and a European Maritime Single Window. It should give a full account of what is required for NSWs to interact through a harmonized interface or the EMSW. It should also give more details on governance and helpdesk functions and how these would differ across options. The report should also be explicit about when and on what basis decisions on implementation issues, such as who will develop and manage the IT systems, will be taken.	The options are now described in much more detail. A new section including comparison table has been added (new 5.4) to help the reader. Detailed information on governance and helpdesk functions is added. Aspects relevant for deciding implementation mode (e.g. delegation of IT development tasks) are mentioned. See in particular chapters 5.2, 5.3, new 5.4, 6.1.2 and 7.6.
The report should better explain how this initiative interacts with the parallel initiative on paperless transport documents. It should clarify to what extent the two initiatives complement each other and how co-dependent they are in reaching the set objectives and realising the benefits. In particular, the report should analyse to what extent the different approaches of the two initiatives (harmonised reporting system vs certification of systems) could hamper the development of inter-modal transport.	The link to the electronic freight transport documents has been presented in more detail. See chapter 1.3.
The report should expand its discussion of stakeholders' views and their preferences across the options. The current discussion raises important questions that the report does not fully answer. Different stakeholder groups' support for different options appears to vary considerably, with little common	The key aspects of stakeholder opinions regarding the options have been clarified and more detail added. The selection of the preferred option is explained in more detail. The differences in costs (notably: Member States' costs) are explained more thoroughly following the more detailed technical

ground besides the call for simplification. The report therefore needs to be more specific on how the results of the stakeholder consultations and evidence of benefits and costs have influenced the selection of the preferred option. It could elaborate on various concerns expressed by different stakeholder groups, and how these factor into the alternative options. The report should better explain the reasons for differences between cost estimates for the different options, based on a clearer and more complete description of the options.	descriptions of all options. See especially chapters 5.3, 6.1.2, 7.1, 7.6, 8 and Annex 4.
The overall objective of the proposal is to simplify reporting formalities though harmonisation of the data requirements and reporting systems. The report should show how the preferred option will provide stronger incentives for harmonisation compared to the current framework of existing legal data requirements. Also, the preferred option should specify the choice of governance model.	The difference between the proposed options and the baseline situation with regards to the harmonisation outcomes is more clearly presented. The governance model is specified for the preferred option. See chapters 5.3, 5.4 and 8.

The Board issued a second, positive opinion on 20 March 2018 including some additional recommendations. These have been addressed in the second revised Impact Assessment report as detailed in the table below.

RSB recommendations	Modification of the IA report
Main considerations	
The problem description does not provide a clear enough explanation of how the existing systems for reporting formalities function today. Relevant information is scattered across the evaluation, the annexes and other parts of the report.	More detailed information about current reporting situation and especially the different requirements for different vessel categories, is added in sections 2.1 and 2.2 (P1).
The report does not specify when and on what basis implementation issues will be decided,	Clarification and more detailed description is added in section 5.4 and in chapter 8.

e.g. who will develop and manage the IT systems.	
Further considerations	
The problem description should present a more complete overview of the existing reporting systems and their shortcomings. The additions in annex 5 are welcome, and the problem definition section would benefit from incorporating more information from the evaluation and annexes. A clearer description of how the current system builds on different reporting needs for different vessel types with different purposes would better underpin the argument for maintaining alternative systems under the new Single Maritime Window.	More detailed information about current reporting situation and especially the different requirements for different vessel categories, is added in sections 2.1 and 2.2 (P1).
The report has revised the arguments in favour of data re-use. In particular, it presents the potential for more efficient procedures for ports and authorities and for cross-modal information exchanges. The relevant specific objective should integrate this modified argumentation instead of continuing to refer to reduced reporting costs for operators. It could also clarify the importance of re-use in selecting the preferred option.	Some clarification on the main benefit is added in section 2.2 (P3). Where the reference to reduced reporting burden is retained it is explained with sources (the study on eGovernment reduction of administration burden and the consultation outcomes).
The revised version of the report clarifies the differences between the options. Renamed options and a new comparison table are helpful. Nevertheless, the illustrations of the different policy options in Annex 6 are not intuitive. Simpler illustrations, accompanying explanations or both would be helpful and would add to clarity. A simple illustration showing the different options could be added to the options section.	Illustrations of the options are added in sections 5.3.1 – 5.3.6. The illustrations in Annex 6 are complemented by explanatory text.
The report indicates that the Commission would probably assign IT development to a specialised entity, but it does not specify when and on what basis this would happen. The report should at least be explicit about the	The timing and decision on detailed implementation mechanisms (e.g. outsourcing contracts and division of specific tasks between Commission services and decentralised agencies) is clarified in

process. If the decision is part of the legislative proposal, the impact assessment needs to include the underlying analysis.	sections 5.4 and in chapter 8.
The Board takes note of the quantification of the various costs and benefits associated to the preferred option of this initiative, as assessed in the report considered by the Board and summarised in the attached quantification tables. The attached quantification tables may need to be adjusted to reflect any changes in the choice or the design of the preferred option in the final version of the report.	The information in the quantification tables has been double-checked and remains correct.

Evidence, sources and quality

The impact assessment is based on a several sources, using both quantitative and qualitative data. This includes:

- Ex-post evaluation of the Reporting Formalities Directive
- In-depth case studies of five selected ports (Malmö/Copenhagen, Hamburg, Constantza, Bari and Helsinki)
- Public on-line consultation (91 respondents)
- Targeted consultations via surveys (111 respondents) and consultation events (5 workshops and meetings with a total of 167 participants)
- 74 interviews (face-to-face or per phone) with stakeholders representing different interests
- External support study by Ecorys/COWI including IT cost assessments
- Reporting time estimate model developed in consultation with ECSA and their associated members
- Baseline scenario based on updated EU Reference scenario 2016, developed with the PRIMES-TREMOVE model by the ICCS-E3MLabLiterature review on relevant material relating to the directive

Annex 2: Stakeholder consultation

Synopsis report on the consultations for impact assessment of Directives 2010/65/EU on Reporting Formalities for ships arriving in and/or departing from ports of the Member States (RFD)

1. Introduction

In June 2017, the European Council invited the Commission to propose follow-up to the revision of Directive 2010/65/EU on Reporting Formalities for Ships (hereafter the RFD). In the preparation of the initiative, extensive consultations were carried out to inform the impact assessment process.

2. Methodology and Consultation Activities

The consultations comprise an Open Public Consultation (OPC) and targeted consultations (TC) including consultation events and workshops, interviews, case studies and an e-survey. Written contributions submitted by the stakeholders have also been received.

Open Public Consultation (OPC)

The OPC online survey was open from 25 October 2017 to 18 January 2018 and available in all official EU languages. In total, 91 replies were received. 13 of these stakeholders also uploaded position papers with their responses[114].

Targeted Consultations (TC)

Survey

The survey was sent by email to over 250 stakeholders with a diverse geographic spread. Additionally, 20 relevant EU-wide industry associations were asked to share the survey with their members. In total, 111 responses were received. The survey was open from 21 December 2017 to 12 January 2018.

Interviews

Targeted in-depth interviews have been completed with 74 representatives of the key stakeholder groups. Each interview lasted approximately 1-1.5 hours. The interviews were conducted from 4 December 2017 to 5 January 2018.

Case study field visit interviews

[114] https://ec.europa.eu/info/consultations/public-consultation-reporting-formalities-ships-european-maritime-single-window-environment_en

Some interviews were completed as part of five in-depth case studies with field visits to ports: Hamburg (DE), Bari (IT), Constantza (RO), Helsinki (FI), Copenhagen/Malmo (DK/SE). These ports are from different sea basins, with different size, traffic and level of implementation of National Single Windows. Each visit lasted at least one day and included several interviews, mainly with port authorities, shipping companies and ship agents.

Consultation events/workshops

Five workshops were organised for focused discussions with the main stakeholder groups. One broader workshop took place at the Digital Transport Days. In total, 167 persons participated in the events. Participants were also offered to contribute additional inputs in writing. Written contributions[115] were submitted by eight Member States, one industry stakeholder and one port association.

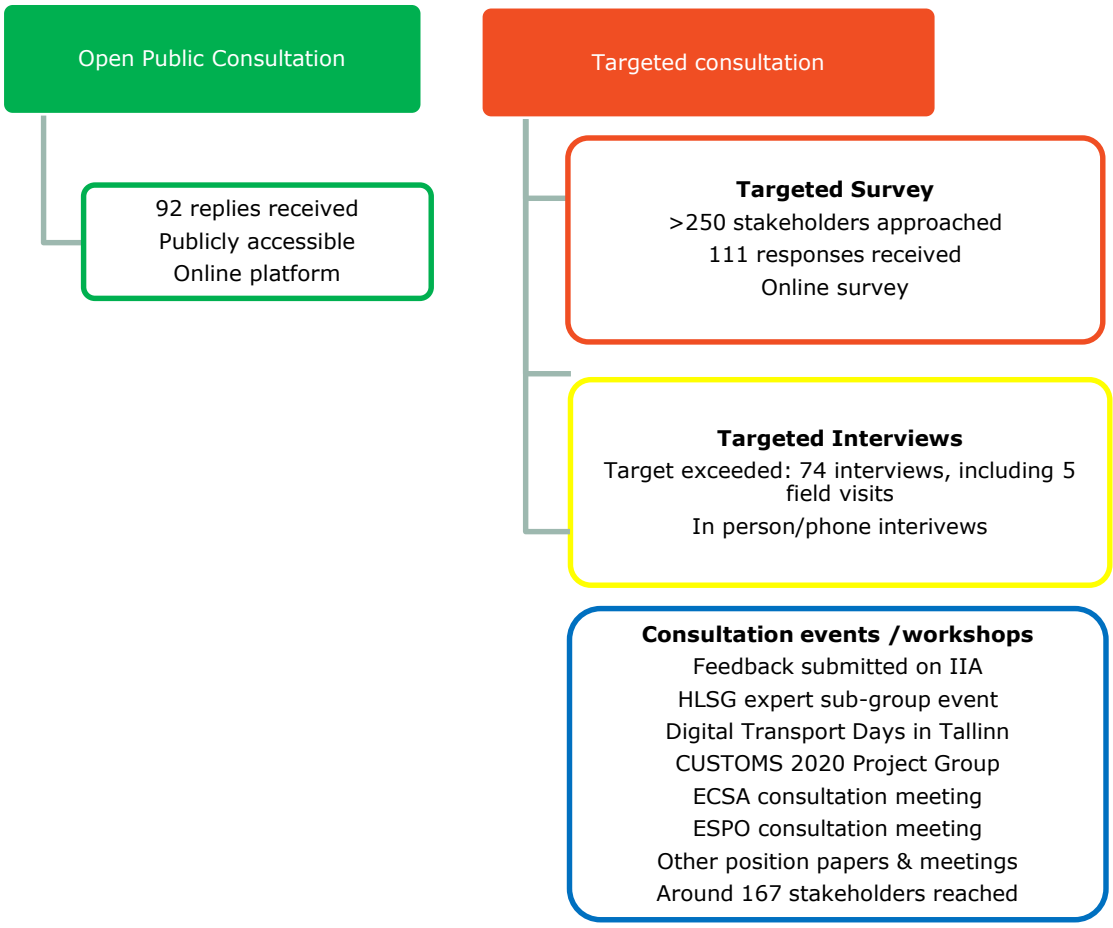
Workshop	Date	Participants	Additional Contributions
ESPO consultation meeting	24 October 2017	13 ports and port associations	n/a
Consultation with the High Level Steering Group: Single Window Subgroup	26 October 2017	16 Member States and Norway, 2 port associations, 2 shipping associations, 1 ship agent association	6 contributions by Spain, France, Italy, Germany, Poland and ESPO
Digital Transport Days in Tallinn: consultation workshop	8 November 2017	65 mixed participants from different stakeholder groups	1 contribution by Spain
ECSA consultation meeting	15 November 2017	18 representatives of ship-owners' associations and shipping companies / shipping company associations	n/a
CUSTOMS 2020 Project Group meeting	15 December 2017	Customs experts from 18 different Member States + observers (industry, stakeholder associations)	2 contributions by custom authorities from Poland and Italy, one from CEFIC

Table 5 - Overview of the workshops conducted by DG MOVE

Outreach was done via the DG GROW SME network, informing SMEs about the consultation opportunities and inviting them to the OPC.

[115] Published on the Commission consultation website

Similarly, the European social partners[116] were approached to ensure the dissemination of the consultation invitations to the maritime transport professionals and the trade unions in the maritime sector.



Identification of Stakeholders

Stakeholders from 29 countries (26 EU Member States) and 16 EU-wide representatives have been consulted.

[116] http://ec.europa.eu/social/main.jsp?catId=480&langId=en&intPageId=1844

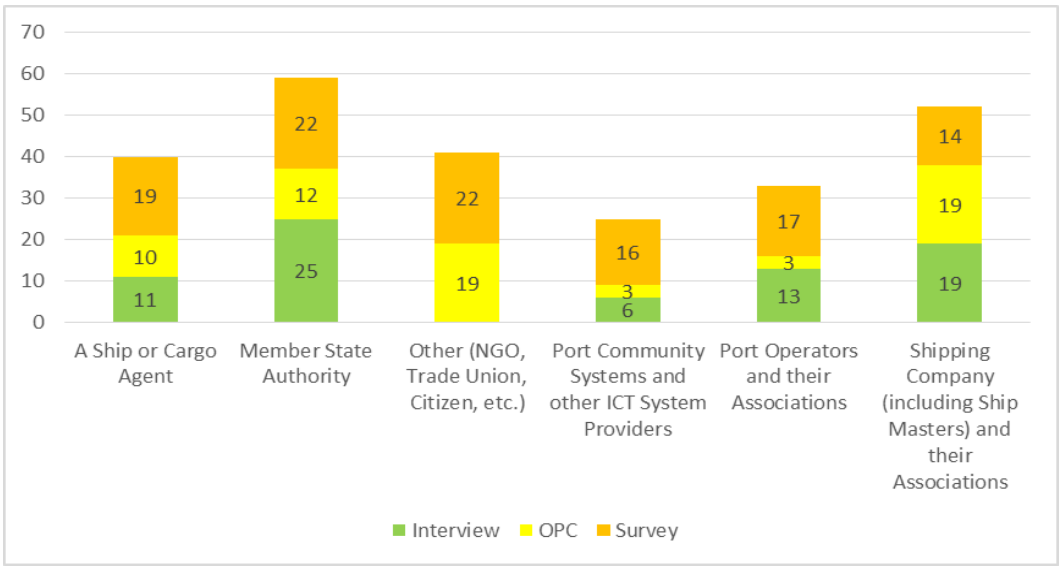


Figure 1 - Overview of the respondents per type of stakeholders

Replies were received from all maritime Member States, with higher participation in the e-surveys from Germany, Sweden, Belgium, Denmark, Finland and the Netherlands. Fewer respondents participated from Ireland, Lithuania, Cyprus, Greece and Croatia. No views at all were received from two of the landlocked Member States: Austria and Hungary.

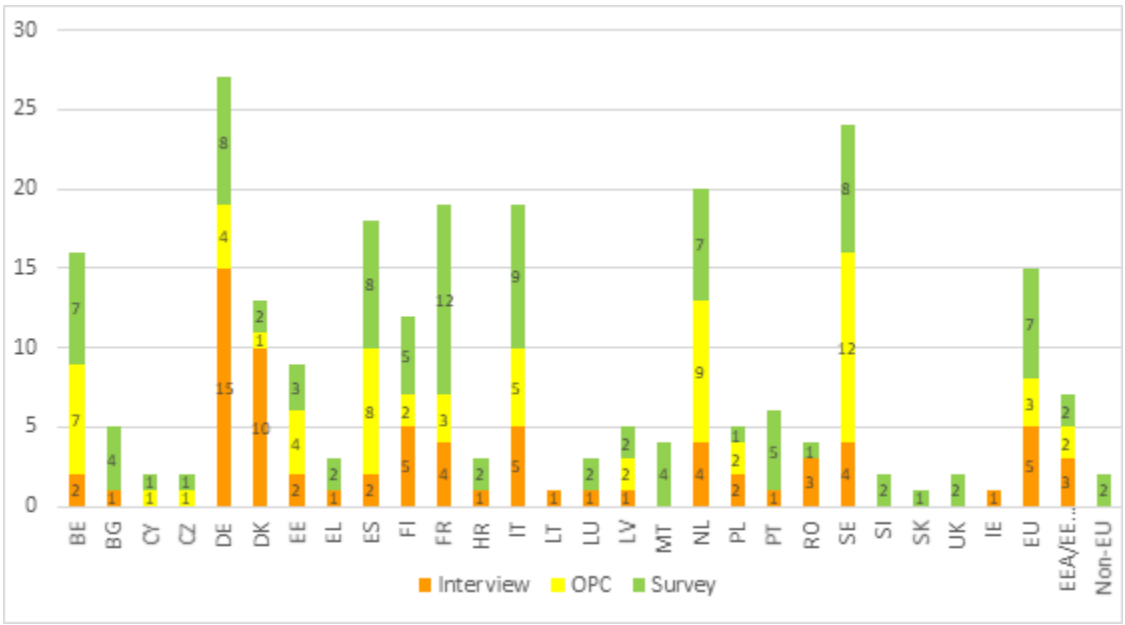


Figure 2 - Geographical overview of the respondents by consultation activities (excluding double responses, n=250)

The possible bias from the uneven participation has been managed by weighting the inputs from the European associations representing the entire geographic range. Respondents for the TC interviews were also selected to achieve a broad geographic spread and a wide representation of different stakeholders (size and type of companies, interests represented, etc.). The limitation of the lower

participation from the Mediterranean sea basin was discussed with the European Community Shipowners' Association (ECSA) who consider the overall results still to be solid and valid as there is no major difference in reporting burden between the different sea basins; the main factor impacting reporting burden is rather by type of traffic and vessel.

3. Results of the Consultation Activities on RFD 2010/65/EU

Feedback on the Inception Impact Assessment

Feedback on the Inception Impact Assessment (IIA) was received from eleven stakeholders: six international associations, one Member State, one Port Community System and three others (shipping related company, citizens).

All these contributors agreed with the Commission problem analysis, although the Member State and the port organisation stressed that the RFD had also achieved some of its objectives (notably: higher level digitalisation). Harmonisation was stressed by all as the main priority to be addressed. One respondent mentioned the need to broaden the scope of the RFD. The Member State and the two port associations voiced concerns regarding the possibility of solving the "reporting only once" problem; the two major shipping associations on the other hand emphasised this as a crucial priority to address. Several stakeholders raised the importance of building on existing standards and systems. The port community systems association supported EDIFACT as standard protocol. From the shipping operators, concerns were raised on the option of reporting via port community systems rather than via public national single windows as this would be a disproportionate and unrealistic option.

Problem definitions

The problem of the current RFD affects in particular the shipping companies and ship agents; these groups also voiced the strongest critique against the lack of harmonisation, lack of a single reporting entry point and inefficient re-use of reported data (in particular static information).

Also other stakeholders in the OPC and TC agree with the identified shortcomings of the RFD and notably the significant administrative burden on shipping companies. It is stressed in particular that the excessive administrative burden undermines the attractiveness of the maritime transport and places it in a disadvantageous position.

The stakeholders with least agreement on the problem description are found primarily among ports and port community systems providers. This is not surprising as the ports are generally not negatively affected by the lack of harmonisation.

Subsidiarity

The majority of the stakeholders consulted in the OPC (82%) confirm that the RFD issues will be more efficiently addressed at the EU level (91% of shipping companies; 92% of ship agents; 70% of Member State authorities; 59% of port operators and 60% of the port community service providers).

When asked about whether the EU action should be mandatory, 83% of OPC respondents agree with the statement. The European associations for shipping operators and agents, such as ECSA and the European Community Association of Ship Brokers and Agents (ECASBA), strongly agree that the action should be mandatory. This is also supported by all shipping companies in the survey and by the

European port associations (Federation of European Private Port Companies and Terminals, FEPORT; European Sea Ports Organisation, ESPO). Only two stakeholders (2%) strongly disagree with the statement that actions should be mandatory: one ship agent and one port operator.

Options

Increased EU level harmonisation: addressing problem driver 1

While there was strong agreement among all OPC respondents that harmonisation will bring some or even high benefits, there was strong fragmentation among the stakeholder groups regarding choice of policy option.

In the OPC, respondents were asked to consider the options of no legal action, harmonisation based on current National Single Windows and harmonisation based on a centralised solution. Overall, a significant majority considered the "no legal action" option (option 0) to be either not (37%) or only slightly (35) effective. The different stakeholder categories replied rather similarly on this.

Options based on the National Single Windows (options A and B) were seen as mostly moderately effective (33%) or very effective (23%). 71% of shipping companies and 74% of ship agents considered this to be moderately, very or extremely effective, with 12% of shipping companies replying it would be extremely effective. Port operators were more sceptical with only 42% considering it to be at least moderately effective. Among Member States, 17% considered the option extremely effective and in total 58% thought it moderately or more effective.

The centralised solution (option C) received high overall support in the OPC with a large share of respondents considering it very effective (33%) or extremely effective (29%). On this option however the views differed highly among stakeholder categories. 92% of shipping companies and 83% of ship agents considered this option to be very or extremely effective. Port operators on the other hand mainly considered it not effective at all (34%) and among Member State authorities 13% thought it would be not effective and 35% only slightly effective.

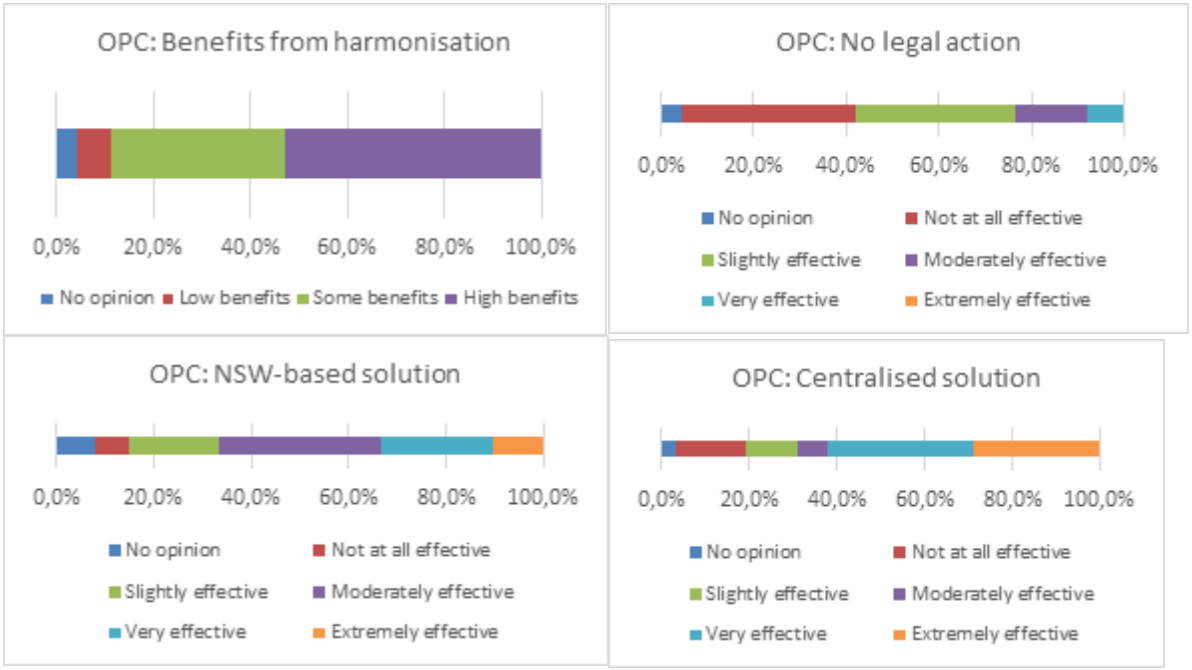


Figure 9: Overall assessment of harmonisation options (OPC)

These differences among stakeholder groups were mirrored in the TC where respondents could choose between five more detailed options[117]. The most preferred option in total numbers was option C (chosen by 30% of all respondents), followed by option A (26% of all respondents). Option B was preferred option by 18% of all respondents. It should be noted that in the interviews, participants could select more than one option as preference.

Option C (centralised solution) is the most preferred by shipping companies and ship / cargo agents (43%) in the TC.

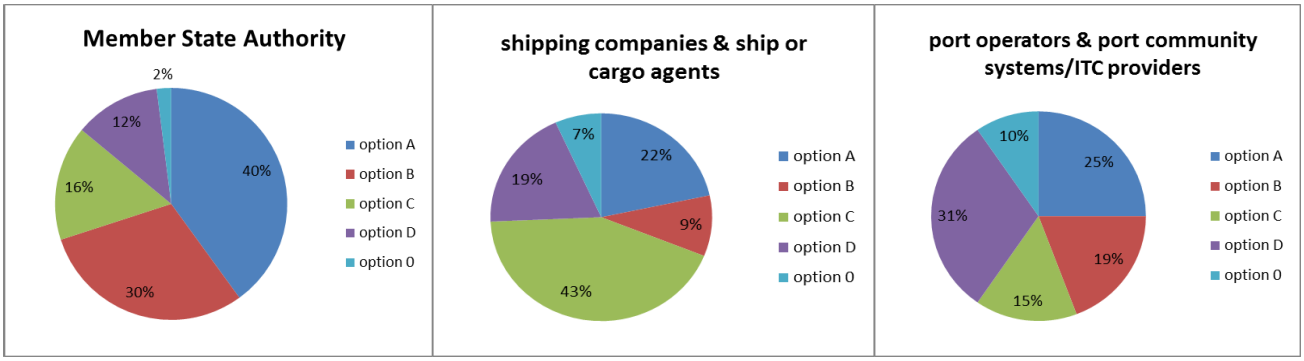


Figure 1: Preferred option per stakeholder category

[117] A: National Single Window solution based on technical specification; B: National Single Window solution based on common interface software; C: centralised European Maritime Single Window; D: mandatory Port Community System solution (discarded) and 0: no legal action / baseline

Member State authorities expressed strongest preference for a solution based on the current National Single Windows (40% for A: technical specifications; 30% for common software). The support for status quo and no legal action (option 0) is the lowest among Member State authority respondents (only 2%). The preference for options A or B also came out very strongly from the consultation events, where Member States voiced strong opposition to a centralised solution.

Port operators and port community systems express the lowest support for a centralised option (15%) and slightly higher preference for no legal action (10%). The largest support from this group was for the discarded option D: mandatory port community systems (31%).

Establishing a single reporting entry point: addressing problem driver 2

83% of all OPC respondents support the proposal to include national requirements (current part C of the RFD) into the mandatory scope of the new reporting environment.

The inclusion of national reporting requirements is supported by both shipping operators (96%), ship agents (82%), port operators (91%) and port community system providers (100% of OPC respondents).

Member State authorities were predictably less interested in such inclusion with only 52% agreeing or strongly agreeing to the statement (5% neutral, 23% didn't know and 18% in disagreement).

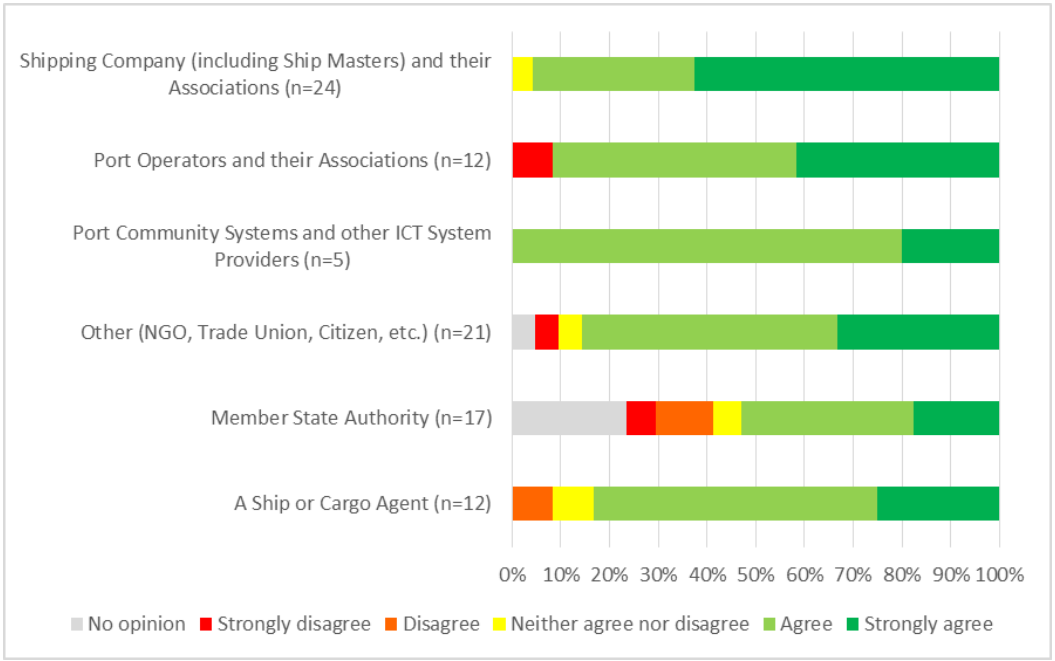


Figure 4 – OPC results: "National reporting requirements should be included in the new framework"

The majority of the shipping companies, port operatorship agents and others perceive that the benefits from including the national requirements will be higher for them than the overall costs.

In regard to a harmonised reporting environment data set, shipping companies and ship agents request rationalisation of data, limiting the reporting to the extent possible by clearing out non-essential data requests. The World Shipping Council (WSC) stated that 'maritime carriers need a single harmonised list of data elements that are genuinely necessary for EU wide port clearance.'

The question of the scope was further addressed in the targeted consultations, where stakeholders were asked also about inclusion of customs formalities.

The majority (73%) of the respondents to the targeted survey believe that it is both technically feasible and beneficial to integrate customs and maritime reporting in one window. Especially shipping companies (93%) and ship or cargo agents (85%) request inclusion of customs formalities, as they consider that this would simplify their reporting procedures. Around 79% of Member State authority respondents consider it both technically feasible and beneficial to integrate customs and maritime reporting. The two contributions received as part of the consultations with the customs expert group are also generally positive to such developments. On the other hand, only 57% of the port community system providers (25% don't know) and 71% of the ports (12% don't know) consider this measure beneficial.

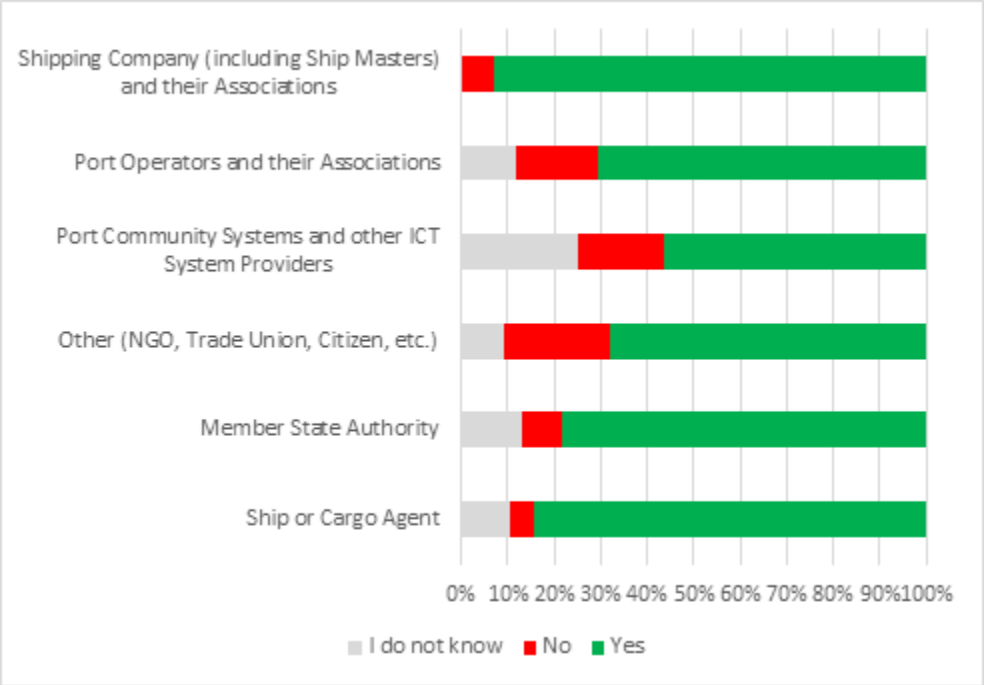


Figure 5 – TC result: "Would it be beneficial if customs reporting went via the same single window as maritime transport reporting"

Benefits from more data sharing and data re-using: addressing problem driver 3

81% of respondents to the OPC expect to have some or high benefits from more data sharing and data re-use. In the targeted interviews, shipping companies show strong support of legislative measures that encourage data sharing and data reuse and that provide clear definitions for the different reporting requirements. The importance of the "reporting only once" principle was stressed in interviews and survey comments by several stakeholders including e.g. ECSA and WSC.

Technical elements of the revised RFD

Regarding governance of the new reporting environment, OPC respondents highlighted the importance of consultation with and involvement of the industry in connection to technical updates of the reporting environment (important or very important priority to 67% of all respondents).

Stakeholders have also been asked about various technical elements in the OPC that could be included or further developed in the revised RFD such as e-certificates and private data.

Provisions for acceptance of e-certificates to allow for future fully paperless ships are supported by 76% of all respondents to the OPC. Especially ship agents (83%) and shipping companies (68%) expect higher benefits from provisions to accept e-certificates.

In the specific targeted consultations, issues regarding personal data reporting were also brought in, following requests in the consultation events during autumn. Across all categories, stakeholders in the targeted consultations agree that it will be highly relevant to clarify inclusion of personal data into the harmonised reporting environment in a manner that is in full compliance with the new General Data Protection Regulation (GDPR). This will provide added value especially for the SME segment of the private maritime sector (shipping companies, agents, port operators, PCS and ICT providers). The consulted SMEs report to struggle to integrate the requirements of the complex GDPR in their business models and would benefit especially from clarified provisions.

Impacts

When it comes to benefits of increased EU level harmonisation, according to the OPC results, 87% of respondents stated that increased EU-level harmonisation of reporting standards, procedures and interfaces is expected to bring benefits to them. 52% of all respondents expect these benefits to be high, mainly expected by the shipping companies (79%). When talking about the cost of harmonisation, 39% expect to have some cost of adaption - 17% expect these costs to be high (mainly port operators, PCS providers and Member State authorities).

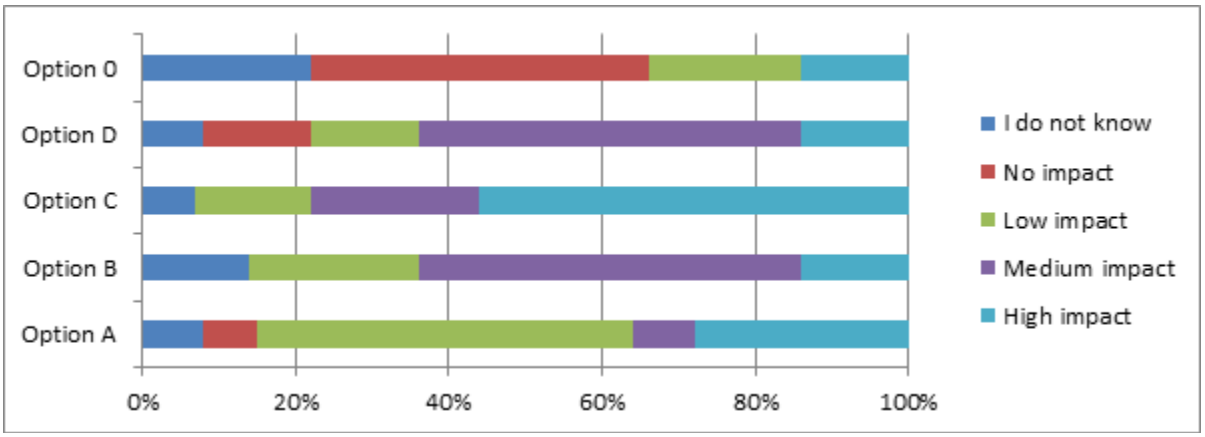


Figure 6 - OPC results: Shipping companies' expected impact in terms of reduction of administrative burden

During the TC survey and the interviews, respondents were also asked to assess economic, social and environmental impacts of the different policy options. Shipping companies expect the largest impact on the administrative burden from option C (centralised solution) as a first step towards a level playing field with road transports. This would therefore support a modal shift towards the more cost effective maritime transport, with environmental benefits as a result. Shipping companies also find that

harmonised reporting will improve working conditions for ship masters and the attractiveness of the sector.

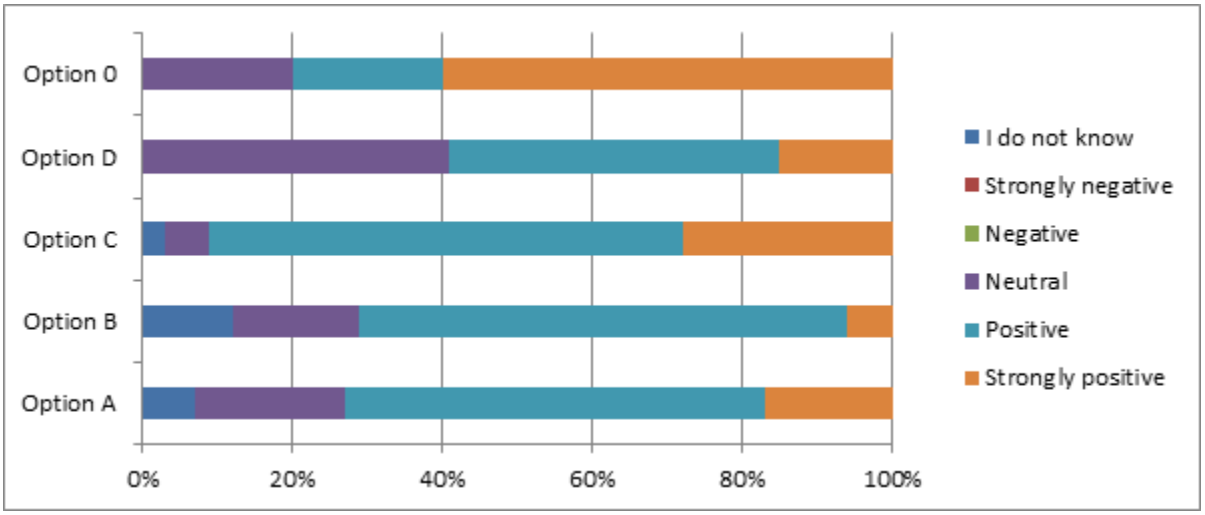


Figure 7 – TC results: Overall job quality, Stakeholders' expected impact

Notably ship agents also stressed in the TC that they see some business opportunities arising from harmonised reporting, especially in combination with better re-use and sharing of data. This would allow them to focus on more value adding work than reporting.

Annex 3: Who is affected and how?

Practical implications of the initiative

- For Member States, national competent authority in charge of the National Single Window: by implementation deadline, to make necessary preparations to install the common EU reporting gateway IT solution and to adapt the National Single Window to be in line with the new technical specifications. To ensure proper connections from the National Single Window to the relevant back-end entities (data recipients).
- For connecting back-end authorities (data recipients), by implementation deadline, to ensure systems are ready to be interoperable with the updated National Single Windows.
- For port operators and other connected private entities: by implementation deadline, adapt as/if needed the systems and connections to the National Single Window to enable reception of data in harmonised format.
- For shipping operators: if choosing to report via the harmonised maritime reporting environment, to adapt systems and data to the harmonised EU format.

Summary of costs and benefits

I. Overview of Benefits (total for all provisions) – **Preferred Option B1**		
Description	Amount	Comments
Direct benefits		
Reduced time spent on reporting for shipping operators (ship masters)	22-25 million staff hours in the time period 2020-2030; equivalent to a value of EUR 625-720 million	Main beneficiary: Maritime transport operators High priority for European shipping companies and ship agents; high pressure from these stakeholder groups to remedy the current situation.
Indirect benefits		
Increased competitiveness of the maritime transport sector as administrative burden is reduced, reporting is simplified and data more efficiently used and shared	A possible shift of 3,395 million tonne-kilometres to waterborne transport in 2030, mostly away from road. This represents about 0.3% increase in the transport activity of the waterborne transport in 2030 relative to the baseline.	Modelling performed with the PRIMES-TREMOVE and TRUST models. In line with the overall Commission Transport Policy (see: Transport White Paper, 2011) modal shift objectives.
Efficiency gains for entire multimodal / logistics chain from better use of data in ports: e.g. harmonised provision and efficient and appropriate re-use of arrival or departure times will enable transport and logistics service providers to optimise the flow of cargo in and out of ports in real-time.	Non-quantifiable.	The efficiency of the ship port calls will impact on the entire logistics chain and the hinterland transports of goods and passengers to and from the ports (per road, rail, pipeline or inland waterways). Stressed by several stakeholders in the consultations.

Increased job satisfaction for ship masters; higher attractiveness of profession leading to improved possibilities for recruitment	Non-quantifiable.	The European maritime industry suffers from an increasing lack of European seafarers, in particular officers. Such a shortage is likely to increase in the coming years to the detriment of the maritime industry, which needs maritime expertise and experience. A main objective of the European maritime policy is therefore to improve employment and working conditions for seafarers on board EU-flagged ships, to make the maritime profession more attractive and ensure compliance with established training standards. The most commonly mentioned indirect benefit from harmonisation, voiced by a high number of shipping companies and ship agents in the various consultations.
Safety and security gains as ship master can spend more time on the bridge	Non-quantifiable.	Commonly stressed by shipping companies in the targeted consultations as likely indirect, unquantifiable benefit.
Better information flows to inform better governance and public services	Non-quantifiable.	Member State authorities likely to benefit indirectly from the improved data flows and access to harmonised data; notably in the long-term with future developments of cross-border data exchanges.
Reduction of CO2 emissions: environmental impact	Freight transport emissions are estimated to decrease by 1,880 thousand tonnes of CO2 relative to the baseline due to the modal shift (see above). This translates into around €145 million of indirect benefits over 2020-2030, expressed as present value.	In line with the overall Commission Policy environmental objectives

II. Overview of costs – **Preferred option B1**						
	Citizens/Consumers		Businesses (shipping operators)		Administrations (MS)	
	One-off	Recurrent	One-off	Recurrent	One-off	Recurrent
Direct costs	n/a	n/a	Adaptation costs ; not quantified	Adaptation to regular updates of formats; not quantified	Average 340 000 per Member State	Average 350 000 per Member State (2020-2030)
Indirect costs	n/a	n/a	n/a	n/a	n/a	n/a

Annex 4: Analytical methods

The analytical work for this impact assessment is based on the PRIMES-TREMOVE transport model and TRUST model. The model suite covers the entire transport system (e.g. transport activity represented at Member State level, by origin-destination and at link level, technologies and fuels at Member State level, air pollution emissions at Member State and link level and CO_2 emissions at Member State level):

- **Geographical coverage:** EU level, all Member States separately.
- **Time horizon:** 2005 to 2050 (5-year time steps).
- **Transport modes covered for freight transport:** road freight (heavy goods vehicles, light commercial vehicles), freight rail, freight inland navigation, international shipping. Numerous classes of vehicles and transport means with tracking of technology vintages.
- **Regions/road types:** traffic represented at country level in PRIMES-TREMOVE; by NUTS 3 region in TRUST model.

In addition, an excel based tool has been developed by COWI/Gartner for calculating the costs related to the IT systems.

1. Description of analytical models used

1.1 PRIMES-TREMOVE transport model

The PRIMES-TREMOVE transport model projects the evolution of transport demand by transport mode and transport mean. It is essentially a dynamic system of multi-agent choices under several constraints, which are not necessarily binding simultaneously. The projections include details for a large number of transport means, technologies and fuels, including conventional and alternative types, and their penetration in various transport market segments for each EU Member State. They also include details about greenhouse gas and air pollution emissions (e.g. NOx, PM, SOx, CO), as well as impacts on external costs of congestion, noise and accidents.

In the transport field, PRIMES-TREMOVE is suitable for modelling *soft measures* (e.g. eco-driving, deployment of Intelligent Transport Systems, labelling), *economic measures* (e.g. subsidies and taxes on fuels, vehicles, emissions; ETS for transport when linked with PRIMES; pricing of congestion and other externalities such as air pollution, accidents and noise; measures supporting R&D), *regulatory measures* (e.g. CO_2 emission performance standards for new passenger cars and new light commercial vehicles; EURO standards on road transport vehicles; technology standards for non-road transport technologies), *infrastructure policies for alternative fuels* (e.g. deployment of refuelling/recharging infrastructure for electricity, hydrogen, LNG, CNG). Used as a module which contributes to a broader PRIMES scenario, it can show how policies and trends in the field of transport

contribute to economy wide trends in energy use and emissions. Using data disaggregated per Member State, it can show differentiated trends across Member States.

PRIMES-TREMOVE transport model has been used for the 2011 White Paper on Transport, Low Carbon Economy and Energy 2050 Roadmaps, the 2030 policy framework for climate and energy and more recently for the Effort Sharing Regulation, the review of the Energy Efficiency Directive, the recast of the Renewables Energy Directive, the 2016 European strategy on low-emission mobility, the revision of the Eurovignette Directive and the recast of the Regulations on CO_2 standards for light duty vehicles.

The PRIMES-TREMOVE is a private model that has been developed and is maintained by E3MLab/ICCS of National Technical University of Athens[118], based on, but extending features of the open source TREMOVE model developed by the TREMOVE[119] modelling community. Part of the model (e.g. the utility nested tree) was built following the TREMOVE model[120]. Other parts, like the component on fuel consumption and emissions, follow the COPERT model.

As module of the PRIMES energy system model, PRIMES-TREMOVE[121] has been successfully peer reviewed[122], most recently in 2011[123].

1.2 TRUST transport network model

TRUST (TRansport eUropean Simulation Tool) is a European scale transport network model covering road, rail and maritime transport[124]. TRUST covers the whole Europe and its

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[118] Source: http://www.e3mlab.ntua.gr/e3mlab/

[119] Source: http://www.tmleuven.be/methode/tremove/home.htm

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

[121] The model can be run either as a stand-alone tool (e.g. for the 2011 White Paper on Transport and for the 2016 Strategy on low-emission mobility) or fully integrated in the rest of the PRIMES energy systems model (e.g. for the Low Carbon Economy and Energy 2050 Roadmaps, for the 2030 policy framework for climate and energy, for the Effort Sharing Regulation, for the review of the Energy Efficiency Directive and for the recast of the Renewables Energy Directive). When coupled with PRIMES, interaction with the energy sector is taken into account in an iterative way.

[122] Source: http://ec.europa.eu/clima/policies/strategies/analysis/models/docs/primes_model_2013-2014_en.pdf.

[123] https://ec.europa.eu/energy/sites/ener/files/documents/sec_2011_1569_2.pdf

neighbouring countries and allows for the assignment of origin-destination matrices at NUTS 3 level (about 1600 zones) for passenger and freight demand.

TRUST projects the average daily loads on road links split by demand segment and by country of origin, road traffic activity (passenger-km, tonnes-km, vehicle-km) per year by country (based on territoriality principle), origin-destination journey time, road accessibility measures by NUTS 3 region, energy consumption and emissions of NOx, PM, VOC, CO and CO_2 by link. TRUST rail network includes different link types according to technical elements (number of tracks, electrification, maximum speed allowed, etc.).

TRUST models maritime connections between the main ports in Europe through links simulating sea routes and allows the computation of distances and cost of maritime transport. TRUST also simulates feeder modes accessing ports (e.g. truck, rail or inland waterways according to existing infrastructures) allowing the definition of full path between true origin and final destination of freight. Ports are classified into three categories: bulk ports, container ports and general cargo ports. Most of the ports belong to more than one category but some ports have only one or two specialisation. Maritime demand consists of origin-destination matrices segmented according to the three freight categories of bulk, container and general cargo.

TRUST is suitable for modelling policies in the field of *infrastructure* (e.g. completion of the core and comprehensive TEN-T network) and *road charging schemes* for cars and heavy goods vehicles.

TRUST is a private model, developed and maintained by TRT[125]. It has been used for the impact assessment accompanying the revision of the Eurovignette Directive, the 2013 ex-post evaluation of transport infrastructure charging policy, for the TRACC - TRansport ACCessibility at regional/local scale and patterns in Europe[126] and for other TEN-T projects focusing on e.g. improving the ports and multimodal transport links of the northern Adriatic[127].

1.3 COWI/Gartner model for IT system costs

An excel based tool has been developed by Gartner (COWI sub-contracting partner for the support study) for calculating the costs related to the IT system. The cost model was

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[124] See Annex A of Ricardo et al. (2017) Support Study for the Impact Assessment Accompanying the Revision of Directive 1999/62/EC.

[125] Source : http://www.trt.it/en/tools/trust/

[126] http://www.espon.eu/main/Menu_Projects/Menu_ESPON2013Projects/Menu_AppliedResearch/tracc.html

[127] https://ec.europa.eu/inea/en/ten-t/ten-t-project-implementation-successes/improving-ports-and-multimodal-transport-links-northern

developed to estimate the investments and ongoing costs for implementing the policy options. The model estimates this both for EU and for the Member States (MS).

In order to estimate the MS cost of the three retained policy options, the assumption is that the complexity of the NSW and therefore the complexity of implementing the policy options is functionally the same across the MS. In reality, most MSs should experience lower actual investments than estimated in this study.

The following two factors are driving the differences in costs between Member States, among systems of similar functional scope: Cost of developers and Number of national authorities (i.e. authority interfaces) using the NSW.

The Gartner labour rate database for IT staff has been used to assess the differences in cost of developers across the Member States. The rates used in the cost model are average seniority rates. The estimates for each of the MSs have been adjusted with a factor relative to the European average. The European average day rate is EUR 906,-. For instance, the average rate in Germany is EUR 1102,-, while in Poland it is EUR 506,-.

It is also assumed that all MSs either have an existing NSW or an ongoing NSW implementation (legal requirement of current RFD). This means that reuse of the authority interfaces in the existing NSW is assumed in all retained policy options. A reservation for resources needed to adapt these interfaces is estimated, however not development from scratch.

The costs modelled for the EU in the three retained policy options build on a detailed breakdown for the functionality and for the required IT infrastructure.

The following data sources have been used to populate the cost model for the EU costs:

- EU pan-European systems Peers: Through a number of engagements for the Commission, Gartner has collected data on estimate levels of budget for different activities, such as communication, training and stakeholder management that consider the special governance and working conditions for EU-wide systems.
- Gartner Cost Benchmark data: Anonymised data pointers from peers engaged in cost benchmarks with Gartner and supplied using Gartner's standard IT accounting model. This ensures a very high degree of comparability and possibility to normalise across collected data. These data mainly exist for very mature environments, such as infrastructure areas.
- Gartner IT Key Metrics: On a yearly basis, Gartner conducts a survey covering companies using IT in order to data on spending within all the IT domains. These data are available by geography and industry, and are used to capture trends in spending, as well as typical division of costs among areas. The Gartner IT Key Metrics also include average costs for key cost elements, such as Windows server costs.
- Case data: These are anonymised data pointers collected in Gartner's engagements with clients that cover e.g., project costs that can be used for sanity checks of developed cost models or to provide high-level cost indications. Such case data is currently available for 20 pan-European information systems.

The model of the EU costs is a 10 year TCO model, estimating the total costs (investments and ongoing costs). Where relevant (e.g., for IT hardware), a TCO figure has been used, which includes depreciations. This means that the model is stable and can be projected beyond the 10 years, unless changes in the assumptions occur.

The model assumes that the efforts for the EU can be undertaken within existing organisations of the EU, therefore it does not include costs for e.g., establishing a new European agency.

The cost model for the EU uses the comprehensive Maritime Single Window data set as a starting point for estimating the complexity of the MSW. The functional complexity of the EMSW is independent of whether it is operated by the MSs (Policy Option B and C) or operated centrally (Policy Option D).

The functional breakdown is done with the Fast Function Point Analysis (FFPA) methodology. FFPA is a Gartner adaption of the FPA methodology, which is a method for assessing the complexity of a system, independent of the programming language it will be built and maintained. FFPA has proven useful in estimating both development and maintenance efforts for applications across different types of projects and systems.

Gartner has systematically collected data points regarding functional complexity (number of function points) and the required effort to develop and maintain a piece of software. We can therefore use FFPA to provide a sensible estimate of the cost of developing a system like the EMSW. The number and type of resources for building the EMSW was determined in line with the following steps:

- Counted the expected Functional Size (in FP) per building block for each policy option,
- Determined the expected unit development effort (person days per developed FP) per building block. This is selected from the Gartner benchmarking database based on the following criteria: size in FP, technology mix, requirements stability, and non-functional requirements,
- Calculated the total development effort (per building block or per policy option) by multiplying the expected number of FPs (derived from step 1) with the expected unit effort (person days/FP derived from step 2).

1.4 PRIMES-TREMOVE, TRUST and COWI/Gartner tool role in the impact assessment

The *PRIMES-TREMOVE transport model* is a building block of the modelling framework used for developing the EU Reference scenario 2016, and has a successful record of use in the Commission's transport, climate and energy policy analytical work – it is the same model as used for the 2011 White Paper on Transport and the 2016 European strategy on low-emission mobility. In this impact assessment, it has been used to define the Baseline scenario, having as a starting point the EU Reference scenario 2016 but additionally including few policy measures that have been adopted after its cut-off date (end of 2014).

TRUST model is a European scale transport network model that allows for the assignment of origin-destination matrices at NUTS 3 level for passenger and freight demand. In addition, it provides the maritime connections between the main ports in Europe through links simulating sea routes and allows the computation of distances and cost of maritime transport. At Member State level, the Baseline trend of transport activity in TRUST has been calibrated on PRIMES-TREMOVE projections.

PRIMES-TREMOVE transport model together with the TRUST model have been used to assess the impacts of the policy options on modal shift. More specifically, the time savings achived by the ship operators in the policy options relative to the Baseline have been used to calculate the impacts on the generalised transport costs by origin-destination with the TRUST model. The changes in the generalised transport costs have been subsequently used in PRIMES-TREMOVE to derive the impacts on modal shares for all freight transport modes together with their impacts on CO_2 and air pollutant emissions.

The excel based tool developed by COWI/Gartner has been used for calculating the costs related to the IT system: costs for EU and Member States respectively and taking into account bothe the one-off investments required and the operational costs during the baseline period until 2030.

2. Baseline scenario

The Baseline scenario used in this impact assessment builds on the EU Reference scenario 2016 but additionally includes few policy measures adopted after its cut-off date (end of 2014). Building an EU Reference scenario is a regular exercise by the Commission. It is coordinated by DGs ENER, CLIMA and MOVE in association with the JRC, and the involvement of other services via a specific inter-service group.

For the EU Reference scenario 2016, Member States were consulted throughout the development process through a specific Reference scenario expert group which met three times during its development. Member States provided information about adopted national policies via a specific questionnaire, key assumptions have been discussed and in each modelling step, draft Member State specific results were sent for consultation. Comments of Member States were addressed to the extent possible, keeping in mind the need for overall comparability and consistency of the results. Quality of modelling results was assured by using state of the art modelling tools, detailed checks of assumptions and results by the coordinating Commission services as well as by the country specific comments by Member States.

The EU Reference scenario 2016 projects EU and Member States energy, transport and GHG emission-related developments up to 2050, given current global and EU market trends and adopted EU and Member States' energy, transport, climate and related relevant policies. "Adopted policies" refer to those that have been cast in legislation in the EU or in MS (with a cut-off date end of 2014[128]). Therefore, the binding 2020 targets are assumed to be reached in the projection. This concerns greenhouse gas emission reduction targets as well as renewables targets, including renewables energy in transport. The EU Reference scenario 2016 provides projections, not forecasts. Unlike forecasts, projections do not make predictions about what the future will be. They rather indicate what would happen if the assumptions which underpin the projection actually occur. Still, the scenario allows for a consistent approach in the assessment of energy and climate trends across the EU and its Member States.

The report "EU Reference Scenario 2016: Energy, transport and GHG emissions-Trends to 2050"[129] describe the inputs and results in detail. In addition, its main messages are summarised in the impact assessments accompanying the Effort Sharing Regulation[130] and the revision of the Energy Efficiency Directive[131], and the analytical work accompanying the European strategy on low-emission mobility[132].

PRIMES-TREMOVE is one of the core models of the modelling framework used for developing the EU Reference scenario 2016 and has also been used for developing the Baseline scenario of this impact assessment. The model was calibrated on transport and energy data up to year 2013 from Eurostat and other sources

[128] In addition, amendments to two Directives only adopted in the beginning of 2015 were also considered. This concerns notably the ILUC amendment to the Renewables Directive and the Market Stability Reserve Decision amending the ETS Directive

[129] ICCS-E3MLab et al. (2016), EU Reference Scenario 2016: Energy, transport and GHG emissions - Trends to 2050

[130] SWD(2016) 247

[131] SWD(2016) 405

[132] SWD(2016) 244

2.1 Main assumptions of the Baseline scenario

The projections are based on a set of assumptions, including on population growth, macroeconomic and oil price developments, technology improvements, and policies.

Macroeconomic assumptions

The Baseline scenario uses the same macroeconomic assumptions as the EU Reference scenario 2016. The population projections draw on the European Population Projections (EUROPOP 2013) by Eurostat. The key drivers for demographic change are: higher life expectancy, convergence in the fertility rates across Member States in the long term, and inward migration. The EU28 population is expected to grow by 0.2% per year during 2010-2030 (0.1% for 2010-2050), to 516 million in 2030 (522 million by 2050). Elderly people, aged 65 or more, would account for 24% of the total population by 2030 (28% by 2050) as opposed to 18% today.

GDP projections mirror the joint work of DG ECFIN and the Economic Policy Committee, presented in the 2015 Ageing Report[133]. The average EU GDP growth rate is projected to remain relatively low at 1.2% per year for 2010-2020, down from 1.9% per year during 1995-2010. In the medium to long term, higher expected growth rates (1.4% per year for 2020-2030 and 1.5% per year for 2030-2050) are taking account of the catching up potential of countries with relatively low GDP per capita, assuming convergence to a total factor productivity growth rate of 1% in the long run.

Fossil fuel price assumptions

Oil prices used in the Baseline scenario are the same with those of the EU Reference scenario 2016. Following a gradual adjustment process with reduced investments in upstream productive capacities by non-OPEC[134] countries, the quota discipline is assumed to gradually improve among OPEC members and thus the oil price is projected to reach 87 $/barrel in 2020 (in year 2013-prices). Beyond 2020, as a result of persistent demand growth in non-OECD countries driven by economic growth and the increasing number of passenger cars, oil price would rise to 113 $/barrel by 2030 and 130 $/barrel by 2050.

No specific sensitivities were prepared with respect to oil price developments. Still, it can be recalled that lower oil price assumptions tend to increase energy consumption and CO_2 emissions not covered by the ETS. The magnitude of the change would depend on the price elasticities and on the share of taxation, like excise duties, in consumer prices. For transport,

[133] European Commission/DG ECFIN (2014), The 2015 Ageing Report: Underlying Assumptions and Projection Methodologies, European Economy 8/2014.

[134] OPEC stands for Organization of Petroleum Exporting Countries.

the high share of excise duties in the consumer prices act as a limiting factor for the increase in energy consumption and CO_2 emissions.

Techno-economic assumptions

For most transport means, the Baseline scenario uses the same technology costs assumptions as the EU Reference scenario 2016.

For light duty vehicles, the data for technology costs and emissions savings has been updated based on a recent study commissioned by DG CLIMA[135]. Battery costs for electric vehicles are assumed to go down to 205 euro/kWh by 2030 and 160 euro/kWh by 2050; further reductions in the cost of both spark ignition gasoline and compression ignition diesel are assumed to take place. Technology cost assumptions are based on extensive literature review, modelling and simulation, consultation with relevant stakeholders, and further assessment by the Joint Research Centre (JRC) of the European Commission.

Specific policy assumptions

The key policies included in the Baseline scenario, similarly to the EU Reference scenario 2016, are[136]:

- CO_2 standards for cars and vans regulations (Regulation (EC) No 443/2009, amended by Regulation (EU) No 333/2014 and Regulation (EU) No 510/2011, amended by Regulation (EU) No 253/2014); CO2 standards for cars are assumed to be 95gCO2/km as of 2021 and for vans 147gCO2/km as of 2020, based on the NEDC test cycle, in line with current legislation. No policy action to strengthen the stringency of the target is assumed after 2020/2021.
- The Renewable Energy Directive (Directive 2009/28/EC) and Fuel Quality Directive (Directive 2009/30/EC) including ILUC amendment (Directive 2015/1513/EU): achievement of the legally binding RES target for 2020 (10% RES in transport target) for each Member State, taking into account the use of flexibility mechanisms when relevant as well as of the cap on the amount of food or feed based biofuels (7%). Member States' specific renewable energy policies for the heating and cooling sector are also reflected where relevant.
- Directive on the deployment of alternative fuels infrastructure (Directive 2014/94/EU).

[135] Source: https://ec.europa.eu/clima/sites/clima/files/transport/vehicles/docs/technology_results_web.xlsx

[136] For a comprehensive discussion see the Reference scenario report: "EU Reference Scenario 2016: Energy, transport and GHG emissions - Trends to 2050"

- Directive on the charging of heavy goods vehicles for the use of certain infrastructures (Directive 2011/76/EU amending Directive 1999/62/EC).
- Relevant national policies, for instance on the promotion of renewable energy, on fuel and vehicle taxation, are taken into account.

In addition, a few policy measures adopted after the cut-off date of the EU Reference scenario 2016 at both EU and Member State level, have been included in the Baseline scenario:

- Directive on weights & dimensions (Directive 2015/719/EU).
- Directive as regards the opening of the market for domestic passenger transport services by rail and the governance of the railway infrastructure (Directive 2016/2370/EU).
- Directive on technical requirements for inland waterway vessels (Directive 2016/1629/EU), part of the Naiades II package.
- Regulation establishing a framework on market access to port services and financial transparency of ports[137].
- The replacement of the New European Driving Cycle (NEDC) test cycle by the new Worldwide harmonised Light-vehicles Test Procedure (WLTP) has been implemented in the Baseline scenario, drawing on work by JRC. Estimates by JRC show a WLTP to NEDC CO_2 emissions ratio of approximately 1.21 when comparing the sales-weighted fleet-wide average CO_2 emissions. WLTP to NEDC conversion factors are considered by individual vehicle segments, representing different vehicle and technology categories[138].
- Changes in road charges in Germany, Austria, Belgium and Latvia.
- Reflecting the plateauing in the number of fatalities and injuries in the recent years, in the Baseline scenario it has been assumed that post-2016 vehicle technologies would be the main source of reduction in fatalities, serious and slight injuries while measures addressing infrastructure safety (such as the existing RISM and Tunnel Directives), and driver behaviour (such as legislation improving enforcement across borders, namely Directive

[137] Awaiting signature of act (Source : http://www.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2013/0157(COD)&l=en)

[138] Simulation at individual vehicle level is combined with fleet composition data, retrieved from the official European CO_2 emissions monitoring database, and publicly available data regarding individual vehicle characteristics, in order to calculate vehicle CO_2 emissions and fuel consumption over different conditions. Vehicle CO_2 emissions are initially simulated over the present test protocol (NEDC) for the 2015 passenger car fleet; the accuracy of the method is validated against officially monitored CO_2 values and experimental data.

2015/413/EU facilitating cross-border exchange of information on road safety related traffic offences) would compensate for the increase in traffic over time.

2.2 Summary of main results of the Baseline scenario

EU transport activity is expected to continue growing under current trends and adopted policies beyond 2015, albeit at a slower pace than in the past. Freight transport activity for inland modes is projected to increase by 36% between 2010 and 2030 (1.5% per year) and 60% for 2010-2050 (1.2% per year). The annual growth rates by mode, for freight transport, are provided in Figure 1 below[139].

Road transport would maintain its dominant role within the EU. The share of road transport in inland freight is expected to slightly decrease at 70% by 2030 and 69% by 2050. The activity of heavy goods vehicles expressed in tonnes kilometres is projected to grow by 35% between 2010 and 2030 (56% for 2010-2050) in the Baseline scenario, while light goods vehicles activity would go up by 27% during 2010-2030 (50% for 2010-2050).

Figure 11: Freight transport projections (average growth rate per year)[140]

Rail freight transport activity is projected to grow significantly faster than for road, driven in particular by the effective implementation of the TEN-T guidelines, supported by the CEF funding, leading to the completion of the TEN-T core network by 2030 and of the comprehensive network by 2050. Rail freight activity grows by 51% by 2030 and 90% during 2010-2050, resulting in 2 percentage points increase in modal share by 2030 and an additional percentage point by 2050.

[139] Projections for international maritime are presented separately and not included in the total freight transport activity to preserve comparability with statistics for the historical period.
[140] Source: Baseline scenario, PRIMES-TREMOVE transport model (ICCS-E3MLab)

Transport activity of freight inland navigation[141] also benefits from the completion of the TEN-T core and comprehensive network, the promotion of inland waterway transport and the recovery in the economic activity and would grow by 26% by 2030 (1.2% per year) and by 46% during 2010-2050 (0.9% per year).

International maritime transport activity is projected to continue growing strongly with rising demand for oil, coal, steel and other primary resources – which would be more distantly sourced – increasing by 37% by 2030 and by 71% during 2010-2050.

Transport accounts today for about one third of final energy consumption. In the context of growing activity, energy use in transport is projected to decrease by 5% between 2010 and 2030 and to stabilise post-2030. These developments are mainly driven by the implementation of the Regulations setting emission performance standards for new light duty vehicles. At the same time, heavy goods vehicles are projected to increase their share in final energy demand from 2010 onwards, continuing the historic trend from 1995. Energy demand by heavy goods vehicles would grow by 14% between 2010 and 2030 (23% for 2010-2050).

Bunker fuels for maritime transport are projected to increase significantly: by 24% by 2030 (42% for 2010-2050).

LNG becomes a candidate energy carrier for road freight and waterborne transport, especially in the medium to long term, driven by the implementation of the Directive on the deployment of alternative fuels infrastructure and the revised TEN-T guidelines which represent important drivers for the higher penetration of alternative fuels in the transport mix. In the Baseline scenario, the share of LNG is projected to go up to 3% by 2030 (8% by 2050) for road freight and 4% by 2030 (7% by 2050) for inland navigation. LNG would provide about 4% of maritime bunker fuels by 2030 and 10% by 2050 – especially in the segment of short sea shipping.

Biofuels uptake is driven by the legally binding target of 10% renewable energy in transport (Renewables Directive), as amended by the ILUC Directive, and by the requirement for fuel suppliers to reduce the GHG intensity of road transport fuel by 6% (Fuel Quality Directive). Beyond 2020, biofuel levels would remain relatively stable at around 6% in the Baseline scenario. The Baseline scenario does not take into account the recent proposal by the Commission for a recast of the Renewables Energy Directive.

In the Baseline scenario, **oil products would still represent about 90% of the EU transport sector needs in 2030** and 85% in 2050, despite the renewables policies and the deployment of

[141] Inland navigation covers inland waterways and national maritime.

alternative fuels infrastructure which support some substitution effects towards biofuels, electricity, hydrogen and natural gas.

The **declining trend in transport emissions is expected to continue**, leading to 13% lower emissions by 2030 compared to 2005, and 15% by 2050.[142] However, relative to 1990 levels, emissions would still be 13% higher by 2030 and 10% by 2050, owing to the fast rise in the transport emissions during the 1990s. The share of transport in total GHG emissions would continue increasing, going up from 23% currently (excluding international maritime) to 25% in 2030 and 31% in 2050, following a relatively lower decline of emissions from transport compared to power generation and other sectors. Maritime bunker fuel emissions are also projected to grow strongly, increasing by 22% during 2010-2030 (38% for 2010-2050).

CO_2 emissions from road freight transport (heavy goods and light goods vehicles) are projected to increase by 6% between 2010 and 2030 (11% for 2010-2050) in the Baseline scenario. For heavy goods vehicles, the increase would be somewhat higher (10% for 2010-2030 and 17% for 2010-2050), in lack of specific measures in place. At the same time, emissions from passenger cars and passenger vans are projected to decrease by 22% between 2010 and 2030 (32% for 2010-2050) thanks to the CO_2 standards in place and the uptake of electromobility.

NOx emissions would drop by about 56% by 2030 (64% by 2050) with respect to 2010 levels. The decline in **particulate matter** (PM2.5) would be less pronounced by 2030 at 51% (65% by 2050). Overall, external costs related to air pollutants would decrease by about 56% by 2030 (65% by 2050).[143]

High congestion levels are expected to seriously affect road transport in several Member States by 2030 in the absence of effective countervailing measures such as road pricing. While urban congestion will mainly depend on car ownership levels, urban sprawl and the availability of public transport alternatives, congestion on the inter-urban network would be the result of growing freight transport activity along specific corridors, in particular where these corridors cross urban areas with heavy local traffic. Estimating the costs of congestion is not straightforward, because it occurs mostly during certain times of the day, often caused by specific bottlenecks in the network. In the Baseline scenario, total **congestion costs for urban and inter-urban network are projected to increase** by about 24% by 2030 and 43% by 2050, relative to 2010. **Noise related external costs** of transport would continue to increase, by about 17% during 2010-2030 (24% for 2010-2050), driven by the rise in traffic.

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[142] Including international aviation but excluding international maritime and other transportation.
[143] External costs are expressed in 2013 prices. They cover NOx, PM2.5 and SOx emissions.

Further details on the Baseline scenario are available in the Impact Assessment accompanying the review of the Eurovignette Directive.[144]

3. Time savings assumptions

In the Baseline scenario, the time per port call spent on reporting formalities is estimated at 60 minutes for ships on fixed routes and 180 minutes for ships on non-fixed routes[145]; this assumption has been developed in consultations with shipping industry representatives (ECSA, Interferry, CLIA) and their associated members. The rationale is that ships in fixed route (liner) traffic always call at the same ports, normally only at one or few EU ports. They are therefore less affected by the lack of harmonisation of reporting. The fixed route traffic also includes most of the larger vessels normally applying machine-to-machine reporting. The average reporting time per port call is thus at the lower end for the fixed route traffic. The non-fixed route (tramp) traffic on the other hand by nature calls at multiple ports, requiring more adaptations to the non-harmonised reporting systems. Time spent on reporting is therefore higher. This traffic category also covers mostly smaller size vessels, less likely to apply machine-to-machine reporting. There are exceptions to the general rule in both groups; but the average is considered a correct assumption by the consulted shipping operator representatives.

There is no available data on port calls per traffic type. However, ECSA applies an assumption model built on combining two main factors: vessel size and cargo type. The majority of vessels smaller than 10 000GT carrying bulk (dry or liquid) goods or general cargo are assumed to go in tramp traffic. Larger vessels or vessels carrying other goods (e.g. passengers, containers) are more likely to be in fixed route traffic. There are some exceptions in both categories, balancing out to make the overall assumption hold. Applying these assumptions, it is estimated that about 40% of the total number of port calls in the EU can be attributed to fixed routes and 60% to non-fixed routes[146].

In the policy options A1-C1, on average 30 minutes per call (50%) are assumed to be saved relative to the Baseline scenario for the ships on fixed routes and 135 minutes (75%) relative to the Baseline for ships on non-fixed routes. The higher saving potential for the non-fixed route is based on the higher impact of harmonisation on these ships. The fixed-route ships will primarily benefit from the single entry point, the reduction of duplicate data requests (reporting only once). All traffic types will also benefit from the simplified and harmonised data set.

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[144] Source: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52017SC0180
[145] *Evaluation of the RFD*, p.19-20
[146] Source: own estimates based on Eurostat statistics.

For policy options A2-C2 lower time savings are assumed to be achieved: 12 minutes per call relative to the Baseline scenario (20%) for the ships on fixed routes and 45 minutes relative to the Baseline (25%) for ships on non-fixed routes. The separate entry points for reporting are not only expected to create an additional administrative burden in themselves; there will be little harmonisation of data sets between the two separate reporting entry points with high risk of duplication of data elements in different requested formats. The consulted shipping operators therefore expect only the low end benefits for these options.

The new harmonised entry point will not be mandatory for shipping operators; they will still have the options to report via the non-harmonised and non-simplified old system with several reporting gateways in parallel. It is therefore assumed that not all shipping operators will in fact make use of this option. E.g. some SMEs and some vessels in domestic traffic may choose not to make use of the new reporting system. In the consultations, more than 90% of all shipping operators did ask for a harmonised reporting environment. For a more cautious approach, a gradual uptake from 25-90% over the baseline period has been assumed. This was then also compared against a pessimistic scenario with an estimated lower gradual uptake from 15-80% over the same period.

Time spent on reporting – reduction of administrative burden	
MAIN ASSUMPTIONS	
Fixed route (share of total port calls)	40%
Non-fixed route (share of total port calls)	60%
Labour cost EUR/h	38,35
Discount rate	4%
Hours spent for reporting, average (baseline)	
Fixed route	1
Non-fixed route	3
Time / average time savings (options A1-C1) – ECSA model	
Fixed route	50%
Non-fixed route	75%
Time / average time savings (options A2-C2) – ECSA model	
Fixed route	20%
Non-fixed route	25%

GRADUAL UPTAKE ASSUMPTION	2020[147]	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Expected uptake	0%	25%	50%	75%	90%	90%	90%	90%	90%	90%	90%
Low uptake	0%	15%	40%	65%	80%	80%	80%	80%	80%	80%	80%

	Baseline	*A1*	*A2*	*B1*	*B2*	*C1*	*C2*
EU28							
Staff hours (million hours)	50	25-28	42-43	25-28	42-43	25-28	42-43
Savings compared to baseline	*0*	*22-25*	*7-8*	*22-25*	*7-8*	*22-25*	*7-8*
€ million (present value)	1,520	800-895	1275-1305	800-895	1275-1305	800-895	1275-1305
Savings compared to baseline	*0*	*625-720*	*215-245*	*625-720*	*215-245*	*625-720*	*215-245*
Excluding UK							
Staff hours (million hours)	48	24-27	40-41	24-27	40-41	24-27	40-41
Savings compared to baseline	*0*	*21-24*	*7-8*	*21-24*	*7-8*	*21-24*	*7-8*
€ million (present value)	1,455	765-855	1220-1250	765-855	1220-1250	765-855	1220-1250
Savings compared to baseline	*0*	*600-690*	*205-235*	*600-690*	*205-235*	*600-690*	*205-235*

Table 6: Reduced administrative burden for shipping operators relative to the baseline over 2020-2030

4. Assumptions used to estimate costs related to IT systems

The following TCO model has been elaborated, consisting of three levels of aggregation. The data source(s) used to populate/ estimate/ extrapolate the cost of the category and sub-category, as well as the manner in which it was computed, are detailed in the following tables.

[147] No expected benefits during first year of implementation

Central Costs Level 1. Level 2. Level 3	Description
Software Development ERG Continuous availability DBMS infrastructure Additional functionalities reservation Maintenance ERG Continuous availability DBMS infrastructure Additional maintenance reservation Other software costs	• Cost category covering the EMSW development, maintenance support and other software costs • The development and maintenance ERG costs originate from the FFPA analysis • The continuous availability DBMS infrastructure and other software costs are derived from Gartner's peer Benchmark data cumulated with Gartner Consulting experience and Gartner Case data
Operation Services Managed services A central directory High-availability ERG (Level 2/3 support) Testing Services A certification process for Data Providers A sandbox environment for national authorities Supporting services Deployment services Support the national authorities Support the NSWs integrating Service desk for National Authorities Training services Other supporting services	• Comprehensive set of operation services that should be offered to cover all three retained policy options: managed services, testing, supporting services, service desk for National Authorities, training and other supporting services • Gartner Benchmark peer data fed into testing services, as well as into deployment services • Managed Services. A central directory: Calculated considering ½ FTE based on 24/7 availability • Managed Services. High-availability ERG (Level 2/3 support): Calculated considering 1 FTE based on 24/7 availability using synergies with EMSW's maintenance and that of other systems • Testing Services have been costed in line with the Gartner Benchmark peer data points, considering the costs of setting up and supporting the certification process for the Data Providers • Gartner IT Key Metrics data has been leveraged to estimate the costs for the service desk for National Authorities, while Gartner benchmarking data fed into costing training and other supporting services. For the training services, across the three retained policy options 12 monthly training sessions have been envisaged

Central Costs Level 1. Level 2. Level 3	Description
Stakeholder Managed Services Stakeholder on boarding services Awareness raising activities Community management services Share best practice and experience	• Stakeholder on-boarding services and community management services have been envisioned as part of the EMSW Stakeholder Management Services, both costed in line with Gartner Benchmark peer data points, as well as other data points provided by EMSA
Technical Specification Maintenance Maintain eManifest and other exchange standards	• Maintenance. Maintain the technical data sets (eManifest and Maritime Single Window data set) and other exchange standards: The cost is associated with that of 1 FTE
Programme Management Vendor management Programme coordination	• Cost category covering both vendor management activities and programme management coordination activities, necessary for EU retention of resources • All cost elements included under Programme Management are in line with Gartner Consulting professional expertise
Infrastructure Server & Storage	• The Server & Storage costs were computed multiplying the number of environments across both data centres with the cost per Linux server adding up the cost of 1/ 5/ 10 raw terabytes of storage in line with Gartner Benchmark peer data and Gartner Case data
Contingency Contingency (20%)	• Across the three retained policy options, 20% out of the total costs per year are added up to account for the Contingency, defined as unforeseen costs to be spent by EU, not covered by any of the other cost categories

		Baseline	*A1*	*A2*	*B1*	*B2*	*C1*	*C2*
EU28								
Costs for the Member States[148] (€ million, present value)	CapEx	-	13,5	10,7	7,8	7,1	10,7	10,7
	OpEx	108	14,3	11,0	8,1	6,8	8,1	8,1
	Total MS	*108*	*27,8*	*21,7*	*15,8*	*13,9*	*18,8*	*18,8*

[148] Member States' baseline cost for annual operation of the current National Single Windows remains in all options: the additional costs come on top of the annual costs of a NSW.

Costs for the EU (European Commission or other entity assigned with the task) (€ million, present value)	CapEx	-	1,7	1,7	2,5	2,5	2,4	2,4
	OpEx	-	9,6	9,6	11,0	10,9	13,0	12,0
	Total EU	-	*11,3*	*11,3*	*13,5*	*13,3*	*15,4*	*14,4*
Total costs (€ million, present value)		**108**	**39,1**	**33,0**	**29,4**	**27,2**	**34,2**	**33,2**
Excluding UK								
Costs for the Member States [149] (€ million, present value)	CapEx	-	12,9	10,2	7,5	6,8	10,2	10,2
	OpEx	104	13,7	10,5	7,8	6,6	7,8	7,8
	Total MS	*104*	*26,6*	*20,7*	*15,2*	*13,4*	*18,0*	*18,0*
Costs for the EU (European Commission or other entity assigned with the task) (€ million, present value)	CapEx	-	1,7	1,7	2,5	2,5	2,4	2,4
	OpEx	-	9,6	9,6	11,0	10,9	13,0	12,0
	Total EU	-	*11,3*	*11,3*	*13,5*	*13,3*	*15,4*	*14,4*
Total costs (€ million, present value)		**104**	**37.9**	**32,0**	**28,7**	**26,7**	**33,4**	**32,4**

Table 7: Investment/adaptation and operational costs (total period 2020-2030, EUR million, present value); 4% Better Regulation discount rate applies.

Member State Costs **Level 1. Level 2. Level 3**	**Description**
CAPEX Adaption of NSW Adaption of national authority systems	• The estimation of the development effort is based on FFPA, a Gartner adaption of the IFPUG FPA methodology for assessing functional complexity of software. The ERG development costs were plugged into the cost analysis • Adaptation of NSW and adaptation of national authority systems are dependent on Cost of IT developers across Member States. Gartner's rate card statistics and IT Key Metrics have been used to factor in the differences in IT manpower across the Member States. The factor between the least and most expensive is a factor of 3 • Adaptation of national authority systems is dependent on the number of local authorities involved in the NSW. The number of authorities in each Member State drives the number of integrations that require adaptations

[149] Member States' baseline cost for annual operation of the current National Single Windows remains in all options: the additional costs come on top of the annual costs of a NSW.

Member State Costs Level 1. Level 2. Level 3	Description
OPEX Annual Adaption of NSW Annual Adaption of authority systems	• The estimation of the maintenance effort is based on FFPA, a Gartner adaption of the IFPUG FPA methodology for assessing functional complexity of software. The ERG maintenance costs were plugged into the cost analysis • Adaptation of NSW and adaptation of national authority systems are dependent on Cost of IT developers across Member States. Gartner's rate card statistics and IT Key Metrics have been used to factor in the differences in IT manpower across the Member States. The factor between the least and most expensive is a factor of 3 • Adaptation of national authority systems is dependent on the number of local authorities involved in the NSW. The number of authorities in each Member State drives the number of integrations that require adaptations and maintenance

The costs for Member States differ between the options mainly depending on the level of adaptations required for the NSWs:

The support study has analysed the additional costs for MS in the scenarios with the three policy options. This means the costs for adapting or updating the existing NSWs (CAPEX) and the increase in annual maintenance of the NSW due to expanded scope and functionalities in the updated system (OPEX). These costs therefore come on top of the baseline cost of annual operation and maintenance of each NSW already today. The NSW's are assumed to remain in the picture across options B, C and D.

The NSW's today consists of two bundles of functionality:

1. The front-end reporting interface(s) to the data providers, i.e. the functionality associated with receiving and validating the reporting data set and sending back responses.
2. The back-end connections to the authorities, i.e. the functionality associated with sending authority-specific data sets, and with sending, and receiving messages.

In Option B, each MS will need to take on the costs for developing the necessary solutions to implement the technical specifications and subsequently adapt the existing NSW's to the

technical specifications. This requires them to update both functionality bundles 1 and 2. The estimate of this is based on function-point counting.

In Option C, the front-end reporting interface in the existing NSW's is replaced by the centrally developed and fully harmonised reporting gateway component. Member States have to plug in this software to the National Single Windows and ensure that the translation from the common software to the back-end connections works. This means that they replace the original functionality bundle 1 with the centrally developed software. Therefore, the MS CAPEX of option C is lower than in option D (and B), as all NSW systems are recent implementations and it is therefore a relatively simple process to integrate the centrally developed interface and switch off redundant functionality. The associated estimate for Option C is 100 man-days. For Option C, the functionality bundle 2 also needs to be adapted and maintained (same as in option B and D).

The MS OPEX of option C is also lower than in option D. Instead of managing the full software development cycle of functionality bundle 1, they only need to care about initial adaptions and then recurring installation and testing of the front-end reporting gateway solution they receive from EU-level.

In Option D, the central European Maritime Single Window is implementing functionality bundle 1 (providing the harmonised front-end interface towards the users). Each Member State need to adapt their current functionality bundle 1 in the existing NSW's and transform the NSWs into playing instead a routing function between the central gateway and the "functionality bundle 2" connections. Also, they need to adapt the functionality bundle 2, facing the individual national authorities. This corresponds to the lines: "Adaption of NSW", and "Adaption of authority interfaces" in Table 11 of Appendix G of the support study.

Since in Option D, the NSW's can still receive reporting directly from data providers (national traffic), they also need to update functionality bundle 1 in the same manner as is required in option B. In total, the CAPEX costs for option D are therefore higher than in option C for Member States.

As is explained in Appendix G of the support study, Table 12 – 14, the MS costs vary significantly between the MS for the following reasons:

- The estimates are taking a starting point in a generic estimation of the complexity of providing the functionality provided in a NSW, which drive the complexity of the adaptions and maintenance.
- As the development and maintenance efforts in MS are typically done by specialized IT staff or specialized IT service providers, the massive differences in cost of developer staff between MS should be reflected. They vary from €392 in Bulgaria to € 1263 in the Nordic countries using market data gathered by Gartner.

- As the complexity of the NSW varies with the number of authorities connected to the NSW, a complexity adjustment has been calculated based on data gathered from the national authorities.

Regarding EU costs for the options.

- Development costs for the ERG:
    - In all options B, C, and D the EU is required to contribute to the functionality bundle 1 (see above). In option B, the technical specifications are developed at EU level. In Option C, a complete solution for the functionality bundle is developed and distributed to MS. In option D this functionality is installed on EU servers to provide the central service.
- Stakeholder Management Services consists of two sub-categories: "Awareness-raising activities" and "Share best-practice and experience". "Awareness raising activities" are estimated at equal levels based on data gathered by Gartner on other EU policy initiatives. "Share best-practice and experience" vary between the options for the following reasons:
    - Options B are estimated to drive a slightly lower but still significant cost as the value of exchanging experience with implementing the technical specification can save costs and time in the MS implementation.
    - Options C are estimated to drive the largest cost, as sharing best practice and experience will be crucial for the success of effectively deploying and integrating a centrally developed interface.
    - Options D are estimated to have the lowest cost, as the need to share best practice will be lower with a central service.
- Support services:
    - The cost model estimates costs for support services towards national authorities, e.g. service desk and training offered. These costs are estimated to be higher for Option C than for the other options as the installation of central software will generate additional requests compared to the other options
- Costs are also calculated for operation services such as the central directories, for programme management and for infrastructure (e.g. servers, storage, network). These costs are expected to be more or less similar regardless of the option.
- Development costs are initiated in year two of the cost model in order to leave time for finding and contracting service providers for the development work.

Annex 5: the Reporting Formalities Directive

In 2010, the Reporting Formalities Directive (RFD) was adopted with the aim to simplify, digitalise and harmonise administrative procedures for maritime transport. The Directive introduced National Single Windows (one single reporting entry point for each Member State) for reporting, in digital format, on a set of 14 agreed procedures stemming from EU or international law.

The RFD covers three types of reporting formalities (as listed in Parts A-C of Annex 1):

- **Part A**: information required by **EU legislative acts.** This includes notification for ships arriving in and departing from ports of the EU, information on border checks on persons, notification of dangerous or polluting goods carried on board, notification of waste and residues, notification of security information and entry summary declaration for customs. The data is collected for a set of purposes, e.g. to facilitate traffic management, for safety and security, for border controls and for environmental objectives.

- **Part B**: information provided in accordance with the **IMO 'FAL Convention'** (general and cargo declaration, ship's store declaration, crew's effect declaration, crew and passenger list and dangerous goods information) and with the **International Health Regulations** (maritime declaration of health). This data is submitted in line with international standardised forms (IMO).

    - Part A and Part B together require the submission of around **230 data elements.** Some of the data elements collected in Part A and B serve double purposes and feed several of the back-end entities.

- **Part C**: information required by **national legislation** of the Member State of the port of call. Part C data is not mandatory for Member States to request via the National Single Windows. These data sets differ for each Member State and there has until yet been no harmonisation of formats. This information is mostly linked to ship/port operations (bunkering, piloting, tug requests, etc.). The on-going mapping of national reporting has found that shipping operators may be required to provide to local authorities up to **200 different data elements** in addition to part A and B.

This covers the maritime transport related reporting a shipping operator must perform in connection to a port call but not the bulk of cargo-related reporting (primarily to customs authorities).

The Reporting Formalities Directive is a coordination mechanism to facilitate for maritime transport operators when calling an EU port. It established a mechanism (the National Single Windows) for streamlining the reporting requested in a set of EU and international legal acts. It doesn't cover all reporting requested from a ship (notably: cargo reporting to customs; only non-mandatory reporting of national and legal requirements) and the Directive does not

specify the data model or data format to be used. The Directive does not add any reporting formalities; it only specifies how Member States need to coordinate the reporting requests under a certain set of legal acts via a single reporting entry point.

In the absence of binding technical specifications, Member States have interpreted and implemented the Directive in different ways: e.g. applying centralised or decentralised National Single Window set-ups, using different data formats and reporting templates and requesting different sets of additional national reporting requirements in national formats via the reporting entry point. Although most maritime Member States have established some kind of National Single Window, these Single Windows can be arranged in many different ways. Some are fully centralised at national level, some have national level specifications and procedures but are implemented at local/port level in a distributed system of entry points. In other case the reporting obligations are fulfilled via the commercial Port Community Systems which in turn send information to the national authorities.

The Directive doesn't cover all existing reporting obligation requested from a ship (notably: most of cargo reporting to customs; only non-mandatory reporting of national requirements, statistical requirements).

While cargo reporting to maritime authorities is fulfilled submitting the general and cargo declaration (FAL forms 1 and 2, see Part B), the RFD only mandates the transmission of the **Entry Summary Declaration** to customs via the National Single Windows. The Entry Summary Declaration covers around **50 cargo data elements**. Around another **100 data elements** are required by the Union Customs Code (Reg. 952/2013/UE) and must be sent directly to the customs IT systems. These data have been mapped by the Commission eManifest pilot project, with the purpose of assessing how to fulfil all cargo reporting obligations (both maritime and customs) with the use of an electronic harmonised data set encompassing all required cargo data elements.

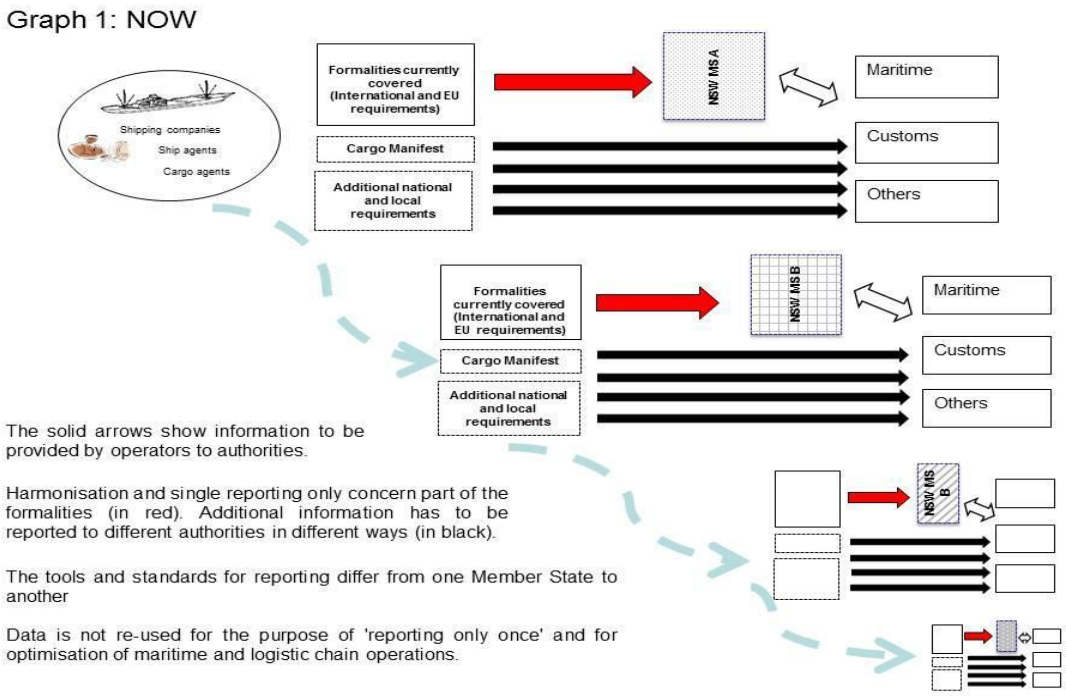
DG MOVE launched the eManifest pilot project in 2016 in collaboration with DG TAXUD and with the support of EMSA. 14 Member States and 14 shipping industry associations participate in the pilot project. The pilot aims to establish a harmonised electronic data set encompassing cargo data elements required for maritime and customs reporting. It assesses how this information can be submitted to the authorities. EMSA has already developed a prototype for the testing of submission of cargo formalities along with the remaining non cargo reporting. The project has run in four phases where cargo reporting formalities have been assessed and gradually added to the testing, with final outcomes during 2018. The outcome of the pilot project will be business rules and a data mapping made up of all cargo data elements, supporting the future harmonised European Maritime Single Window environment.

When a vessel calls in an EU port carrying goods, depending on factors like the last port of call and the type of cargo on board, a set of formalities may have to be submitted to customs authorities, notably the arrival notification, the presentation notification of goods and the

declaration for temporary storage. Other formalities are envisaged instead at the departure from an EU port, like the exit summary declaration, re-export notification, or the notification of exit for goods under export procedure

Reporting to customs is necessary most of the times even when goods are carried between two points of the EU territory by sea. In this case, maritime operators can benefit of simplified reporting through the submission of the 'customs goods manifest' or of the 'electronic transport document for simplified transit'. None of these simplified procedures are mentioned in the RFD and are therefore out of the scope.

This limited scope of the RFD means that, today only about one third of all information requested from a ship in a port call is always requested via the NSWs. This has been pointed out by shipping operators as one of the main problem drivers. The separate reporting paths mean uncoordinated reporting with duplications and non-harmonised formats.



This graph is a simplified picture illustrating the main reporting flows from ships, not taking into account the detailed and more complex two-way flows of information to and from customs.

Annex 6: Policy options

	A: *Harmonised NSWs: technical specifications*	B: *Harmonised NSWs: common software*	C: *Central EMSW*	D*: Mandatory PCS (discarded)*
1. Comprehensive single entry point solution	**Option A1:** Measures A, 1 and I-VI	**Option B1:** Measures B, 1 and I-VI	**Option C1:** Measures C, 1 and I-VI	Option D1: Measures D, 1 and I-VI
2. Separate entry points customs / maritime	**Option A2:** Measures A, 2 and I-VI	**Option B2:** Measures B, 2 and I-VI	**Option C2:** Measures C, 2 and I-VI	Option D2: Measures D, 2 and I-VI

Alternative measures

Problem Driver 1: Diverse ship reporting formats, interfaces and procedures used throughout the EU

No.	Policy measures A-D
Alt. A	**Harmonised reporting gateways as front-end to the National Single Windows (NSWs): based on binding technical specifications** Introduce binding harmonised requirements and technical specifications for the front-end reporting gateway in the existing NSWs in the Member States. The specifications would cover e.g. data content, message structure format, exchange protocols, user interface requirements and other rules as necessary for ensuring the necessary information exchanges business rules. They would be set at EU level but responsibility for implementation and operation would be fully on the Member States. The result would be a decentralised system of NSWs with identical reporting gateway functionalities for ship reporting.
Alt. B	**Harmonised reporting gateways as front-end to the National Single Windows (NSWs): based on common IT solution** Develop a mandatory common harmonised reporting gateway/ front-end interface component at EU level, for installation in every NSW. Regular updates as required would be supplied via the EU. The operational responsibility would be on Member States but with helpdesk functions for the software installation at EU level. The result would be a decentralised system of identical reporting gateways, providing exactly the same "look and feel" front-end in every Member State.
Alt. C	**Central European level reporting gateway: introduction of a centralised EU-level reporting entry point** Introduce a centralised, EU-level reporting gateway / front-end interface. The centralised reporting gateway would offer one single reporting entry point for all port calls throughout the EU including the necessary two-way information exchanges between the data providers and the back-end connected entities and systems. The NSWs would remain in place as the router between the centralised reporting gateway and the national level data recipients. Member States would be responsible for ensuring connection of their National Single Windows to the centralised gateway.
Alt. D	**Mandatory Port Community Systems (PCS) as basis for harmonised reporting gateways in Member States (technical specifications)** Build the EU level harmonisation requirements and binding technical specifications on mandatory PCS reporting gateways in the Member States (all other details same as in alternative A above).

Problem Driver 2: Diverse ship reporting information requirements throughout the EU – several parallel reporting entry points

No.	Policy measure
Alt. 1	**Comprehensive single entry point solution (introduction of a mandatory comprehensive Maritime Single Window data set)** Set a wide scope for the reporting by ships in connection to a port call to be accepted via the harmonised European Maritime Single Window environment: covering the current scope of RFD, the national reporting requirements and channelling of customs formalities for ships into (and return messages from) the customs IT systems at national and EU level.
Alt. 2	**Separate entry points customs / maritime (introduction of a mandatory limited Maritime Single Window data set)** Set a limited scope for the reporting by ships in connection to a port call to be accepted via the harmonised European Maritime Single Window environment: covering the current scope of RFD and the national reporting requirements. Customs formalities to be reported via the parallel and harmonised customs IT systems.

Common/complementary set of measures (enabling framework)

Problem Driver 2: Diverse ship reporting information requirements throughout the EU – several parallel reporting entry points

No.	Policy measure
I	**Introduction of specifications for acceptance of e-certificates** Enable development of e-certificates acceptance by initiating processes for specifications and technical solutions (e.g. common registries).

Problem Driver 3: Unclear legal framework for sharing and using reporting information – no "reporting only once"

No.	Policy measure
II	**Establishment of data re-use principles for "reporting only once"** A set of clear principles, rules and rights for data sharing and reuse will be developed to ensure correct and smooth data management and "reporting only once" for carriers, as a minimum first step within the same port. Clear definitions for different requirements will be provided. Definitions and specifications concerning the processing and management of personal or commercially sensitive data will be addressed.
III	**Development of common databases to support the system** This includes a common exemption database, a common (federated) user database(s) and a common ship repository.

Problem Driver 4: Inadequate implementation

No.	Policy measure
IV	**Introduction of a governance mechanism** A governance mechanism will be created to ensure timely and appropriate legal and technical updates. Implementing and/or delegated powers for maintenance of e.g. the technical specifications are proposed. This will be accompanied by the set-up of the required expert groups for coordination and consultation with Member States and with industry stakeholders as needed.
V	**Development of a complaint/feedback mechanism** A complaint/feedback mechanism will be offered to maritime transport operators as a tool to alert authorities if the harmonised reporting and the reporting only once principles are not respected or if any technical fault is found in the reporting systems.

VI	**Development of helpdesk function** To facilitate implementation, technical support to Member States on the European Maritime Single Window environment specifications and software in the form of e.g. helpdesk functions, technical advice or development of application guidelines will be developed.

The figure below illustrates the reporting environment in options A1 and B1. Each National Single Window has a harmonised front-end interface (a reporting gateway), either harmonised via technical specifications – software development done by the Member State – or by plugging in a front-end module developed at EU level.

Regardless of what port or Member State the shipping operator calls to, the reporting interface will thus be the same (with identical functions in option A1; identical interface in option B1).

The National Single Windows then distributes the data to the back-end data recipients, in the formats they require (using translation functions if needed) and providing subsets of data on need-to-know basis only. These back-end data recipients include for example border control authorities, health authorities, customs IT systems, the SafeSeaNet and port community systems. These back-end interfaces will remain as in the current National Single Window set-ups, with reservation for adjustments due to harmonisation of the data set.

A number of common databases and user registries are maintained at EU level for facilitating the functioning of the system.

The initiative does not ban other reporting paths and a shipping operator may choose to report part of their data directly to, for example, port community systems or customs IT system (see example of "optional connection" in the figure below).

In options A2 and B2, the same set-up would be established but the reporting to customs IT system would be separate from the National Single Window reporting (shipping operators reporting directly to the customs IT systems for the cargo-related data).

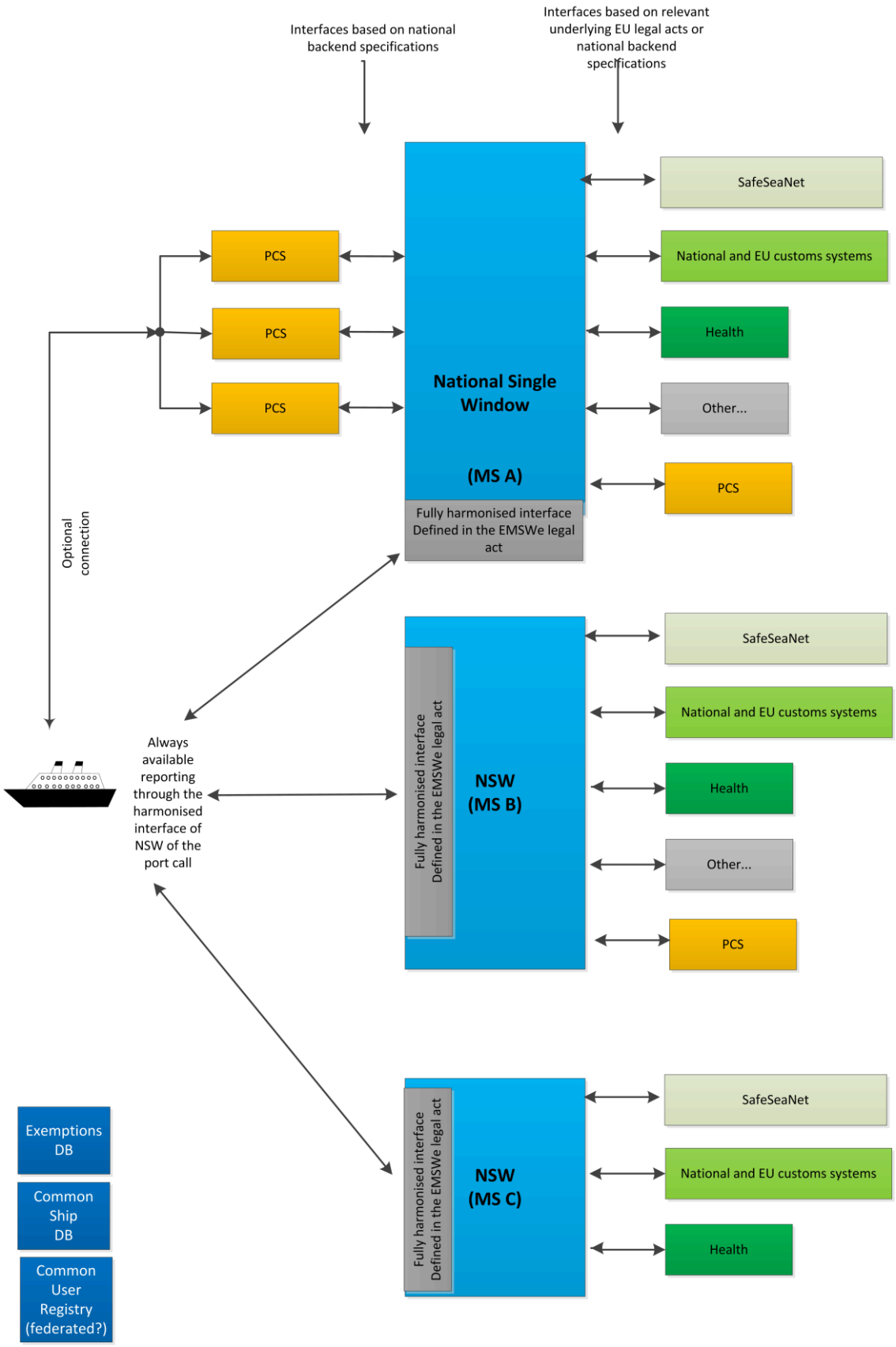


Figure 12: Option A-B, distributed system with harmonised entry point (via technical specifications or common front-end IT solution)

The following figure illustrates the centralised scenario in option C1. The shipping operator can report directly to a centralised and harmonised reporting gateway ("EMSW"). The data is then routed via this gateway to the National Single Windows and to the back-end data recipients (see also next figure below for the detailed illustration of customs IT system connections). The centralised gateway also connects to a number of common databases and user registries.

The National Single Windows would need to be adapted their front-end to connect with the centralised new reporting gateway. The back-end interfaces will remain as in the current National Single Window set-ups, with reservation for adjustments due to harmonisation of the data set.

The initiative will not forbid the continuation of alternative reporting paths. A shipping operator may therefore have the option to report part of their data directly to, for example, National Single Windows, port community systems or customs IT system (see examples of "optional connection" in the figure below).

In option C2, the same set-up would be established but the reporting to customs IT system would be separate from the European Maritime Single Window reporting (shipping operators reporting directly to the customs IT systems for the cargo-related data).

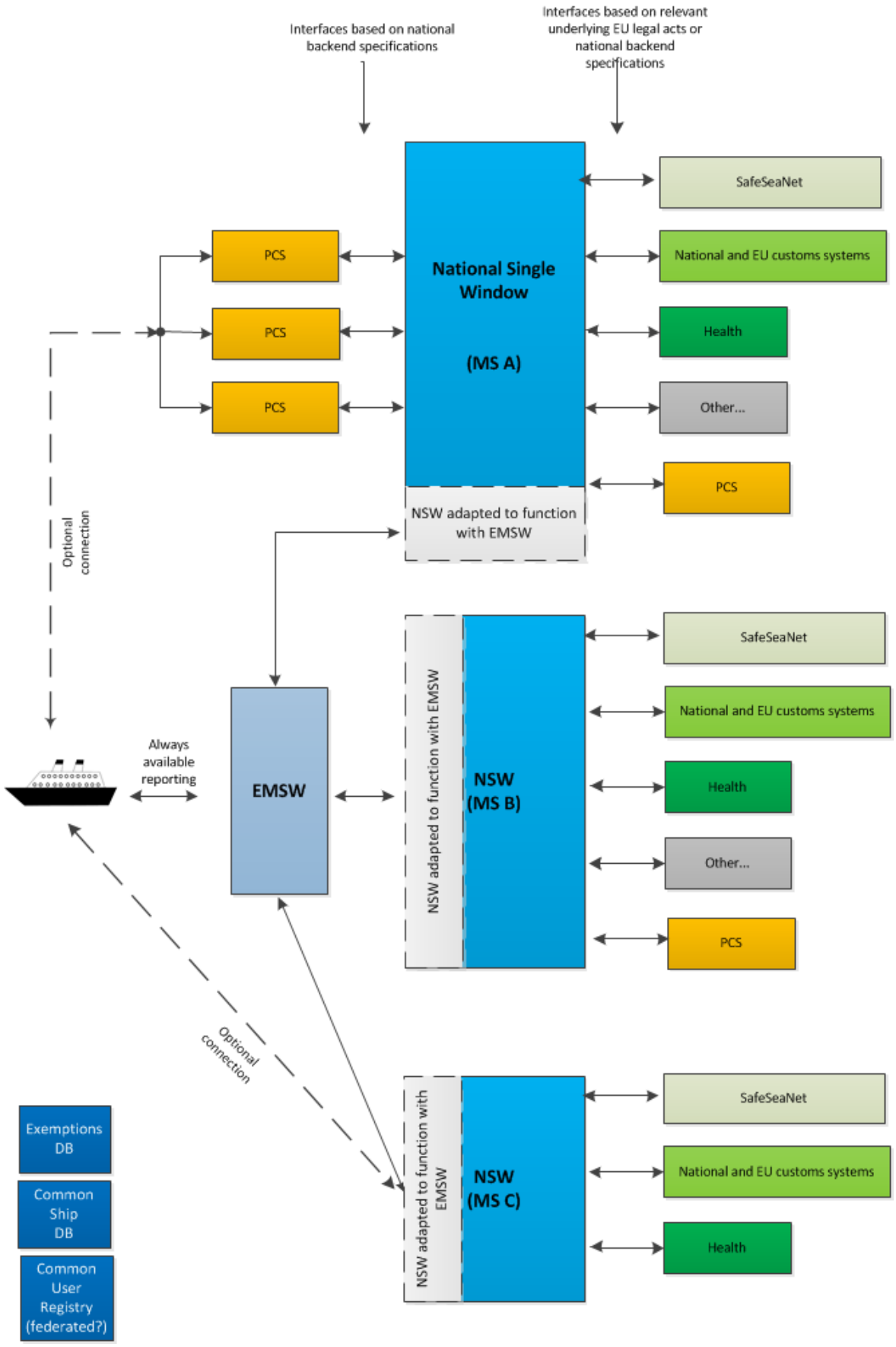


Figure 13: Option C, centralised system

The figure below illustrates in more detail the connections between the maritime single window (national or centralised level) and the customs IT systems in options A1, B1 and C1. The initiative will not interrupt existing reporting paths and a shipping operator may choose to continue reporting their cargo-related data directly to the customs IT systems.

The shipping operator may however also choose to report the entire maritime single window data set via the harmonised maritime reporting gateway, from where the data is routed and distributed as required to the back-end connected authorities. This may require translation of some data elements to ensure the back-end authorities receive the data subsets in their required formats, following the specifications in the underlying legal acts. The maritime single window would also need to transmit the two-way flow of messages between customs IT systems and the shipping operators.

This reporting environment set-up thus creates inter-connection between the maritime transport reporting and the customs formalities for ships.

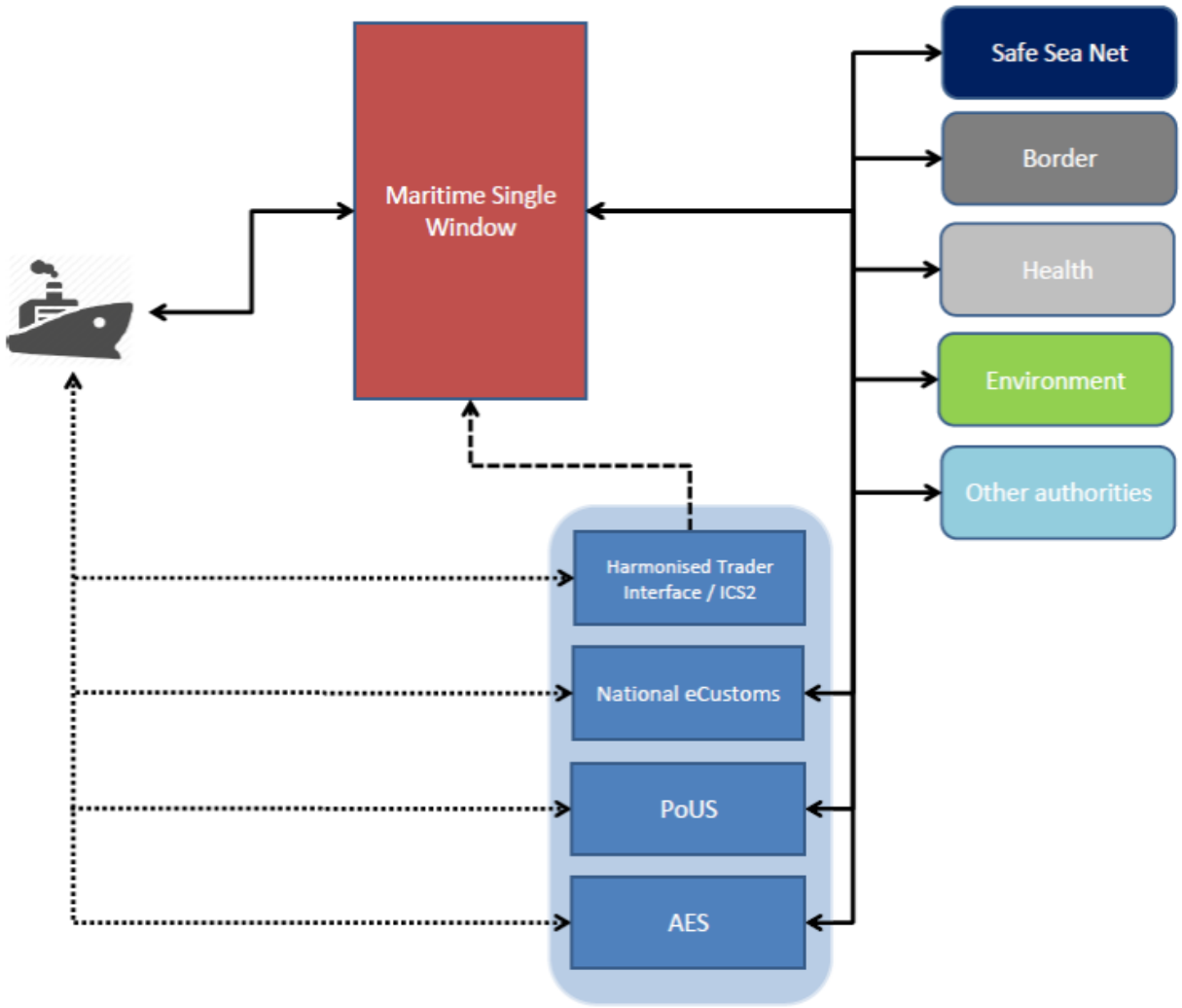


Figure 14: Connection between the maritime single window and customs IT systems: reporting options for shipping (detailed technical implementation for these connections between the maritime national single windows and customs IT systems will be subject to further IT feasibility studies)

Affected stakeholders and their key interests

Stakeholder	Description	Key interests
Shipping operators	Operators providing EU and international seaborne trade and maritime passenger services; data providers at port calls	Simplified reporting procedures to minimise administrative burden and maximise efficiency of port calls for shorter turnaround times
On-board staff	Ship masters and other crew involved in reporting procedures	Minimise repetitive and cumbersome procedures to release work time for core tasks; protecting the quality and reputation of the profession
Shipping agents	Agents and logistic companies organising or facilitating trade exchanges including port call reporting for ships	Competitiveness of sector; protection of the role and position of the profession; efficiency of port reporting procedures to maximise profitability
Port authorities	Public or private bodies that own and/or manage the ports	Developing and maintaining profitability, independence and competitiveness of the port; level playing field for port competition
Maritime authorities	National or local authorities regulating and controlling maritime transport	Level playing field for and within the maritime transport sector contributing to jobs, growth and trade; efficient information flows from ships to enable authority follow-up in line with applicable law; ensuring an effective, cost-efficient and practicable management framework that balances stakeholder needs
Customs authorities	Authorities regulating and controlling customs procedures	Efficient, timely and reliable submissions of declarations and notifications from the economic operators; smooth two-way exchange of information and notifications between customs and the economic operators
Consumers	Industries or individual citizens benefitting from the availability and prices of goods delivered by seaborne trade or travelling as passengers by sea	Availability and cost of goods and passenger services

Annex 7: Connected policy areas

Digital single market policy

This initiative contributes to the Commission priority of establishing a connected Digital Single Market[150]. The Council conclusions on digitalisation from 5 December 2017, emphasising the importance of interoperability and harmonisation of interfaces for data exchange as an enabler for seamless and efficient cross-border multimodal transport services and stressing that digitalisation helps reduce the administrative burden and simplify procedures, creating a level playing field for all transport operators.

Digitalisation of government services and business-to-administration interactions is a key element to the success of the single market, helping to remove existing digital barriers and delivering efficiency benefits. The *Communication on a European Strategy for Low-Emission Mobility*[151] highlights that digital technologies offer significant potential for optimising the transport system and open up new opportunities for manufacturing and services. Digital technologies also support the integration of transport with other systems, such as the energy system, and make the mobility sector more efficient.

But to reap the full benefits of digitisation in the field of transport, it is necessary to create the regulatory frameworks to incentivise the development and market uptake of such technologies, and to set standards to ensure interoperability, including across borders, and enable data exchange while at the same time addressing data protection and cyber-security issues.

Automation and technical development in ships is expected to have an impact over time, including with higher uptake of automated reporting systems, sensors and machine-to-machine communications. Development of autonomous/un-manned vessels[152] may challenge legal frameworks and technical progress on secure data sharing and data exchange aspects via e.g. block chains, cloud solutions or electronic IDs and e-certificates, can open opportunities but also raise new questions for the legislators. Aspects of data protection, cyber security and

[150] European Commission Communication, *A Digital Single Market Strategy for Europe*, COM(2015) 192 final, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52015DC0192&from=EN

[151] European Commission Communication, *A European Strategy for Low-Emission Mobility*, COM(2016) 501 final, https://ec.europa.eu/transport/sites/transport/files/themes/strategies/news/doc/2016-07-20-decarbonisation/com%282016%29501_en.pdf

[152] Horizon 2020: Smart, green and integrated transport, https://ec.europa.eu/programmes/horizon2020/en/h2020-section/smart-green-and-integrated-transport

data privacy (technical developments, legal frameworks) are expected to continuously evolve. Cyber-crime, IT failure or data breaches ("cyber incidents") are an increasing concern and were listed as third among the "10 Global Business Risks for 2017" by a recent insurance company report[153].

A more harmonised and digital reporting environment for ships is considered an important contribution towards these objectives. The establishment of the "European Maritime Single Window environment" is therefore one of the 25 actions listed in the *eGovernment Action Plan 2016-2020*[154]**.** This action plan aims to modernise public administration, to achieve the digital internal market, and to engage more with citizens and businesses to deliver high quality services.

Any proposal to extend digitalisation and especially the development of digital services will also take into account existing EU policy frameworks notably on the General Data Protection Regulation (GDPR) and the Regulation on electronic identification and trust services (eIDAS).

Single market policy: boosting jobs, growth and investments

The establishment of a simplified regulatory environment can also have significant positive financial impact.[155]

Businesses suffer both direct border-related costs, such as expenses related to supplying information and documents to the relevant authority, and indirect costs, such as those arising from procedural delays and lost business opportunities. Based to estimates[156] by the Organisation for Economic Cooperation and Development (OECD), these costs may range from 2% to 15% of the value of traded goods.

Customs policy

The Customs Union is an essential element in the functioning of the single market: ensuring common application of common rules and a common tariff at the Union's external borders.

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[153] *Allianz risk barometer: business risks 2017,* http://www.agcs.allianz.com/assets/PDFs/Reports/Allianz_Risk_Barometer_2017_EN.pdf

[154] European Commission Communication, *EU eGovernment Action Plan 2016-2020, Accelerating the digital transformation of government*, COM(2016) 179 final, https://ec.europa.eu/digital-single-market/en/news/communication-eu-egovernment-action-plan-2016-2020-accelerating-digital-transformation

[155] According to the World Bank study, about 30% ($107 billion) of the total gain from trade facilitation in 75 analysed countries comes from the improvement in port efficiency and about $33 billion emanates from the improvement in customs environment http://documents.worldbank.org/curated/en/977511468764990679/pdf/wps3224TRADE.pdf

[156] http://www.oecd.org/trade/facilitation/35459690.pdf

Customs procedures and control methods are specified in the Union Customs Code[157] which entered into force on 1 May 2016. The Union Customs Code puts emphasis on fully electronic communication between the customs administrations and economic operators and between customs authorities in different Member States, in a paperless environment. The need of the data harmonisation for the exchange of information has brought at the establishment of a Customs Data Model, containing a data set encompassing data elements and definitions required by customs authorities throughout the EU. Moreover, in order to introduce a full digital environment and high level of harmonisation in the whole customs domain, the existing national customs IT systems are being enhanced and adapted to the new requirements set out by the new legislation, while at the same time a number of centralised EU-wide IT systems are being developed and deployed by DG TAXUD. Safety and Security information has been enhanced, mainly through the improvement of data quality, enlarging the reporting to multiple parties along the logistic chain. For this specific purpose, a new centralised system is being developed, gathering all safety and security information, including that coming from the maritime transport.

The transport and customs policy areas are inseparable and must be developed in close coordination. Carriers need to report cargo information to both port authorities and customs authorities when calling at an EU port. The complexity and the number of cargo reporting formalities have brought to a considerable administrative burden for the shipping industry. Therefore, in early 2016, the eManifest pilot project was launched. The overall objective of the project is to test the possibility/practicability of submission of customs entry/exit formalities along with other (maritime) reporting formalities by electronic means in a harmonised manner with assistance of the Maritime SW, with the aim to reduce administrative burden for ship data providers. The harmonised eManifest data set produced for the purposes of the pilot contains the data requirements set in the UCC DA and IA and in the IMO FAL Convention and is in line with the WCO Data Model, ensuring coherence and interoperability between maritime and customs reporting. The coherence between customs and maritime reporting represents a necessary pre-condition for a future interoperability between maritime and customs electronic systems, adopting the technical and functional specifications set out by customs legislation.

Social and environmental policy

Finally, a more efficient maritime transport sector is closely linked to the social and environmental policy contexts.

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[157] Regulation (EU) No 952/2013, laying down the Union Customs Code, 9 October 2013, http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32013R0952

Having competent staff is essential for supporting the growth and prosperity of the maritime industry in Europe. The European maritime industry today suffers from an increasing lack of European seafarers, in particular officers. In line with the *Social Agenda for Maritime Transport*[158], the Commission therefore strives to promote the attractiveness of maritime professions. Reducing and removing cumbersome reporting tasks is one step towards this goal.

The European Commission is working towards a form of mobility that is sustainable, energy-efficient and respectful of the environment. The Transport White Paper calls for a modal shift towards rail and waterborne transports, especially for long-distance shipments[159]. For this, the maritime transport mode attractiveness must be optimised by e.g. reliability, efficiency and low operating and administrative costs. Supporting trade and transport facilitation through simplification of the ship reporting environment is therefore aligned also with environmental policy.

Research and innovation policy

With support from the Horizon2020, European transport research contributes to finding solutions to the increasing mobility of people, with low-carbon technologies, clean vehicles, smart mobility systems and integrated services for passengers and freight. European research aims to strengthen the competitiveness of our transport industries and to develop a better European transport system for the benefit of all.

In the transport sector, research[160] is at the core of developing new technologies for greener, smarter, more efficient transport means and innovative solutions for safer, more sustainable and inclusive mobility.

Statistics

Maritime transport statistics (MTS) are collected by the EU and EFTA Member States according to the Directive 2009/42/EC and transmitted to Eurostat for calculation of EU aggregates and dissemination. In addition, some MTS data are collected on a voluntary basis from Member States. The objective of this data collection is to compile harmonised statistics of the maritime component of European transport activity and to provide information on the carriage of goods and passengers by seagoing vessels calling at EU/EFTA ports as a basis for analysis, monitoring/evaluation and planning of European maritime transport.

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[158] https://ec.europa.eu/transport/modes/maritime/seafarers_en

[159] European Commission, *White paper: Roadmap to a Single European Transport Area*, COM(2011) 144 final, p. 7, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0144&from=EN

[160] https://ec.europa.eu/programmes/horizon2020/en/h2020-section/smart-green-and-integrated-transport

In order to comply with the requirements of the EU legal framework for provision of maritime statistics, the Member States today use various non-harmonised sources for collection of maritime transport data on national level. These data requests therefore fall under the RFD Part C data (national and local requirements; not mandatory to request via the National Single Windows).

Inland waterways transport

In inland waterways, a recently published EC financed study[161] on Digital Inland Waterway Area (DINA) also underlined the administrative burden for barge operators for filing ship reports with the authorities and other mandatory declarations. Barge operators need to comply with relevant legislation. This includes both safety related legislation and other legislation (e.g. statistics).

Barge operators indicate that they need to file the same data multiple times to comply with different aspects of legislation and dealing with different jurisdictions in cross-border operations. From the perspective of the authorities there are also high costs to verify compliance with legislation. There is a potential to make this process more effective and cost-efficient by re-using data that is already there.

Many maritime ports also have an inland port section increasing the administrative burden by having to comply with provisions for both the maritime and inland mode.

Therefore, harmonisation and rationalisation would be very welcome for both economic operators and the administrative side. Ideally authorities should re-use data: from each other (e.g. data already filed with another) and from existing registrations (e.g. readily available business data made accessible for authorities under certain conditions).

Currently, in inland waterways there is no overall framework for electronic reporting covering different purposes.

Combined transport

The Combined Transport Directive (92/1063/EC) is a support instrument encouraging the use multimodal transport of goods where the major part of transport is carried out by rail, inland waterways or maritime transport and is served by a short road leg in the beginning or end of

[161] Digital Inland Waterway Area, ISBN 978-92-79-76485-1
https://ec.europa.eu/transport/sites/transport/files/studies/2017-10-dina.pdf

the transport chain. It foresees regulatory and fiscal incentives for combined transport operations with an aim to foster modal shift of freight transport.

The 2016 evaluation of the Directive under the REFIT programme concluded that while the Directive continues to be relevant for achieving EU transport policy's objective as regards the reduction of these negative externalities, the effectiveness and the efficiency could be further improved by a review as the measures are the definitions are too complicated and the measures partly outdated. Thus the Commission adopted a proposal for amendment on November 8th, 2017 simplifying the definition, improving the enforcement by clarifying the conditions of proof of eligibility and updating the economic incentives.

E-documents for freight transport

Transport documents are central to the freight transport operations. They need to accompany the cargo as it moves, recording signatures and keeping a paper trail of the logistics transfer. Moving from paper to electronic documents offers a large potential to improve the efficiency, reliability and cost-effectiveness of the freight transport operations. Transport documents in electronic format are currently used to different degrees in all transport sectors. However, and in spite of several initiatives in the past years to digitalise transport documents in each transport mode, the percentage of operations employing electronic documents remains in general low. This is particularly the case for multimodal and cross-border transport operations, where electronic documents are least employed.

The need for EU level intervention to support wider uptake of electronic transport documents for freight transport in all transport modes has been first emphasised by participants in the Digital Transport and Logistics Forum (DTLF), an expert group formed by more than one hundred private and public stakeholder representatives.

In May 2017, the Commission launched an impact assessment process to identify the barriers to the wider use of electronic means in information exchange linked to the transport of goods within the EU. The objective is to eventually enable all market players to fully exploit the potential of digitalisation in the field of logistics. A legislative proposal is expected to be part of the third Mobility Package, planned to be adopted in the beginning of May 2018, together with the proposal for the review of the Reporting Formalities Directive (RFD).

Vessel Traffic Monitoring and Information System and SafeSeaNet

SafeSeaNet is a vessel traffic monitoring and information system, established in order to enhance maritime safety, port and maritime security, marine environment protection and the efficiency of maritime traffic and transport.

It has been set up as a network for maritime data exchange, linking together maritime authorities from across Europe. It enables European Union Member States, Norway, and Iceland, to provide and receive information on ships, ship movements, and hazardous cargoes.

The network includes for example the Automatic Identification System (AIS) information from ships.

Progressively, more and information from and on ships is being centralised in the SafeSeaNet system. This means that, now and in the future, a growing number of different types of users are being given the opportunity to access the information they need from a single source, instead of using many different sources. This means that their work is made easier, and that they can operate more efficiently.

Annex 8: Trade and economic patterns

Ports vary substantially both in size and specialisation. The 83 main seaports included in the TEN-T core network handle approximately 70% of the cargo passing through all EU seaports.

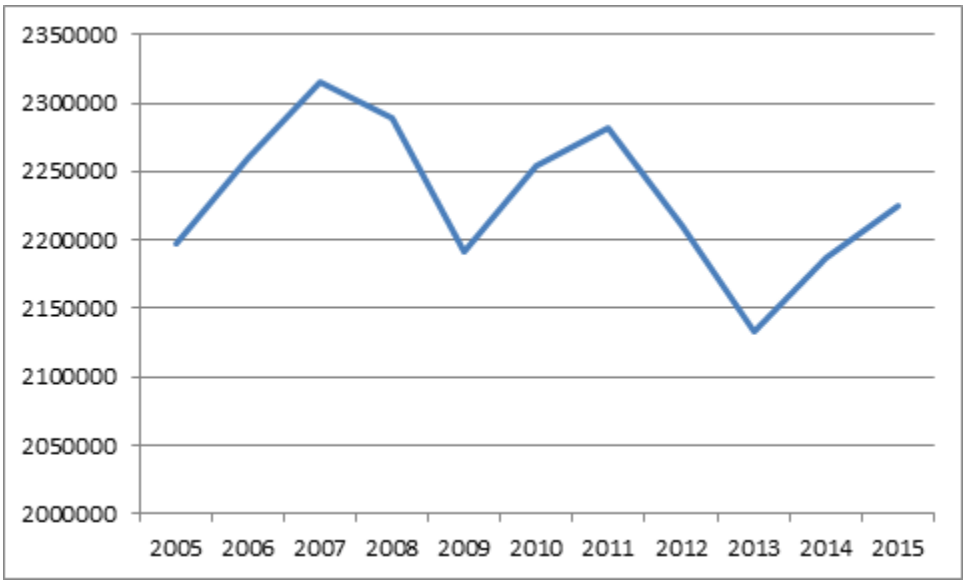

Figure 15: Number of vessels calling EU ports in one year 2005-2015 (EU28)[162]

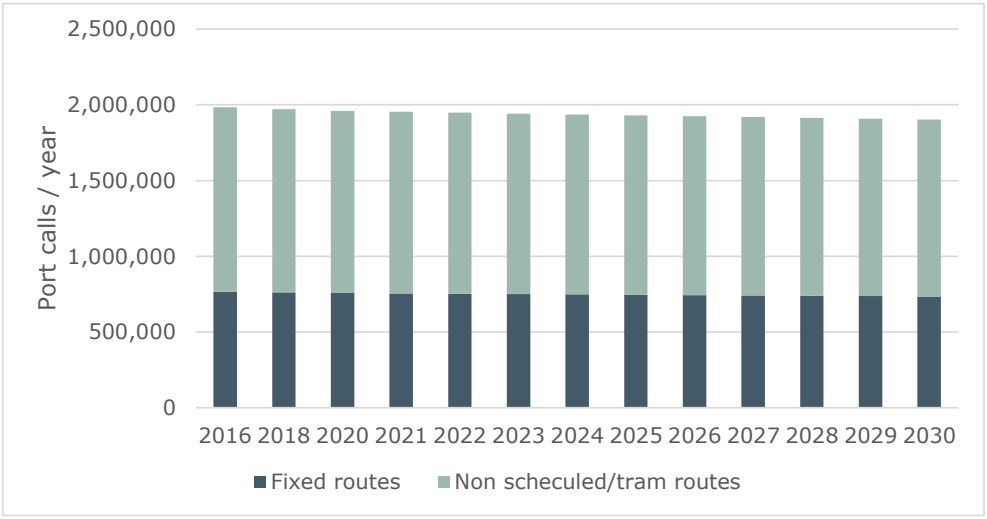

Figure 16: Projected number of port calls 2015-2030 (developed from EU reference scenario 2016 and EuroStat data)

[162] Eurostat, *Maritime ports freight and passenger statistics*, January 2017, http://ec.europa.eu/eurostat/statistics-explained/index.php/Maritime_ports_freight_and_passenger_statistics

Figure 17: Transport growth in EU28: passengers, goods and GDP[163]

Of the goods transported via the main EU maritime ports, liquid bulk goods accounted for 38% of the total cargo; dry bulk goods for 23%, containerised goods for 21% and goods transported on roll-on, roll-off (Ro-Ro) mobile units made up 12 %.[164]

Technical developments constantly change the capacity and composition of the EU fleet. One of the main trends today is the move towards larger vessels. The average size of vessels calling in the main EU-28 ports is slowly increasing and amounted to about 7 400 GT in 2015.[165] Gigaliners, autonomous vessels and vessels with alternative propulsion systems/alternative fuels are being developed.

While the road transport share of goods traffic in the EU steadily increases, the maritime transport modal share has slightly decreased over time, although now somewhat recovering since the dip in 2007-2009. [166]

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[163] European Commission, *Statistical pocketbook 2017: EU transport in figures*, https://ec.europa.eu/transport/facts-fundings/statistics/pocketbook-2017_en

[164] Eurostat, *Maritime ports freight and passenger statistics*, January 2017, http://ec.europa.eu/eurostat/statistics-explained/index.php/Maritime_ports_freight_and_passenger_statistics

[165] Eurostat, *Maritime ports freight and passenger statistics*, January 2017, http://ec.europa.eu/eurostat/statistics-explained/index.php/Maritime_ports_freight_and_passenger_statistics

[166] European Commission, *Statistical pocketbook 2017: EU transport in figures*, https://ec.europa.eu/transport/facts-fundings/statistics/pocketbook-2017_en

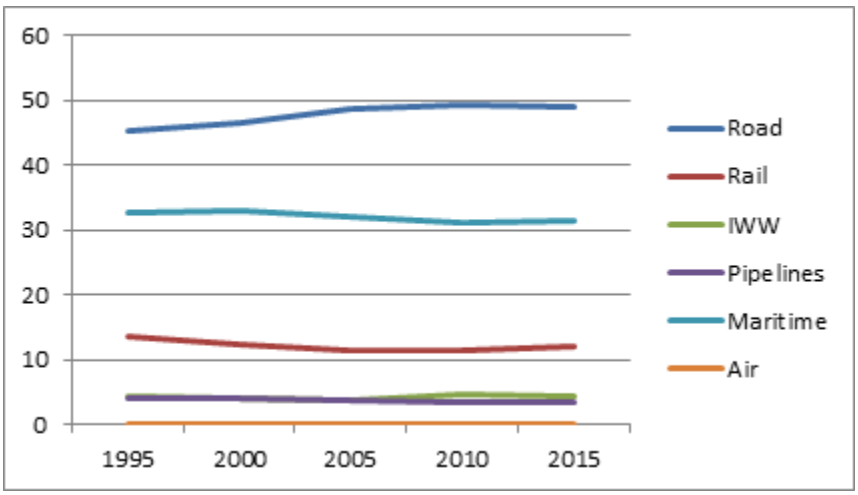
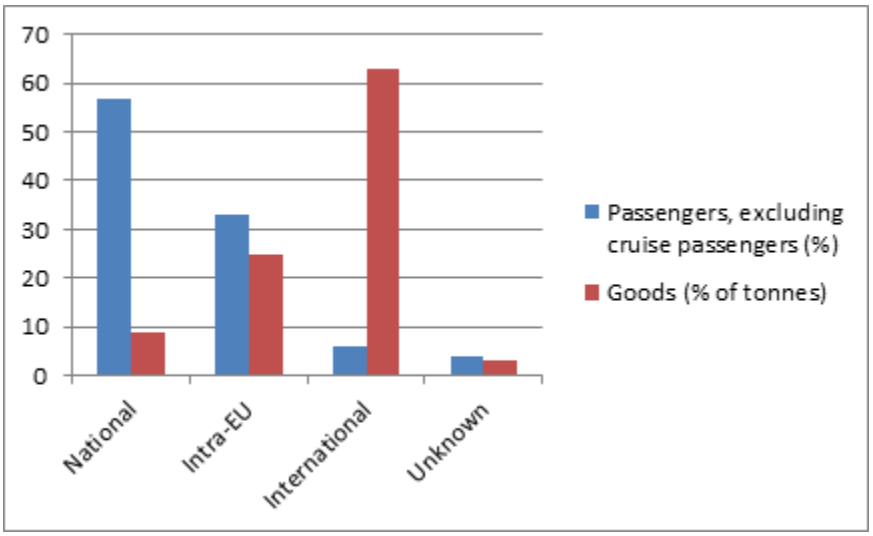


Figure 18: Modal split over time in EU28 (goods transports, single market)[167]



International trade

In 2015, 3.1 billion tonnes of goods were shipped by sea to or from EU ports. This was an increase by 1.6 % from 2014. 63% of these goods were international transports. Maritime

[167] European Commission, *Statistical pocketbook 2017: EU transport in figures*, https://ec.europa.eu/transport/facts-fundings/statistics/pocketbook-2017_en

transport is the most important mode for long distance transport of goods to or from the EU, in tonnage terms. [168]

EU trade exports to a value of 860 billion EUR were transported by sea in 2015. Seaborne imports amounted to a value of 920 billion EUR in the same year. [169]

(% of trade based on value)	Imports	Exports	Total trade
EU28	**53.0**	**48.1**	**50.5**

Table 8: EU Member States trade in goods with non-EU countries carried by sea, 2015[170]

Intra-EU traffic and short-sea shipping

The transport operators in intra-EU traffic and short-sea shipping are the ones most affected by the lack of harmonisation at EU level, together with ships in international traffic calling several different ports in the EU.

Maritime transport accounted for 31.6% of all single market goods transports in 2015. For passenger transports within the single market, maritime mode accounted for 9.8%.

According to Eurostat, 25% of the approximately 3.8 billion yearly tonnes of seaborne goods and 33% of the 395 million passengers going in or out of EU ports are shipped in intra-EU traffic.[171] Estonia, Ireland, Latvia, Malta, Finland and Sweden have especially high shares of international intra-EU transport (above 60 % of all transported goods in tonnes). [172] Larger ports tend to have a larger deep sea and transhipment function compared to smaller ports who tend to have a larger share in short sea transport.[173]

Short-sea shipping is the transport of goods between main ports in the EU-28 member states and ports situated in geographical Europe or in non-European countries on the Mediterranean and the Black Sea. 1.8 billion tonnes of goods were transported as part of EU short sea shipping in 2015, an increase of 0.9 % from the previous year. Short sea shipping made up

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[168] Eurostat, *Maritime ports freight and passenger statistics*, January 2017, http://ec.europa.eu/eurostat/statistics-explained/index.php/Maritime_ports_freight_and_passenger_statistics

[169] European Commission, *Statistical pocketbook 2017: EU transport in figures*, https://ec.europa.eu/transport/facts-fundings/statistics/pocketbook-2017_en

[170] Eurostat Newsrelease 184/2016: World Maritime Day, http://ec.europa.eu/eurostat/documents/2995521/7667714/6-28092016-AP-EN.pdf, 28 September 2016

[171] Eurostat, *Maritime ports freight and passenger statistics*, January 2017, http://ec.europa.eu/eurostat/statistics-explained/index.php/Maritime_ports_freight_and_passenger_statistics

[172] Eurostat, *Maritime ports freight and passenger statistics*, January 2017, http://ec.europa.eu/eurostat/statistics-explained/index.php/Maritime_ports_freight_and_passenger_statistics

[173] DRAFT: Study on support measures for the implementation of the TEN-T core network related to sea ports, inland ports and inland waterway transport: Analysis of major geopolitical and technological developments affecting the future development of the EU seaport system, p. 34 of the draft study; update reference with D3 for final text

close to 59 % of the total maritime transport of goods to and from the main EU ports in 2015, about the same as in 2014.

Hinterland connections: cross-modal links

The smooth functioning of port calls is one link in a longer transport chain. Ports are not the final destination of goods. The efficiency of the ship port calls will impact on the entire logistics chain and the hinterland transports of goods and passengers to and from the ports. Depending on the nature and volume of the goods and on the distance the cargo should be transported, transports per road, rail, pipeline or inland waterways connect to the maritime transports. The shares of each transport mode vary significantly from port to port depending on geographical and other specificities.

Road transport provides, overall, the largest share of throughput transport to and from ports. Road is the preferred mode for smaller volumes of cargo or shorter distances. It provides high flexibility and door-to-door transport possibility.

Rail is a preferred mode for goods on regular/frequent services and for long-distance transport of e.g. dry bulk or containers.

A large share of ports have inland waterway connectivity, especially in the North Sea and Black Sea basins. All ports in Belgium and the Netherlands are connected to the Rhine-Scheldt delta. In the Black Sea area, the Romanian ports are connected by the Danube. The low cost and high capacity makes inland waterways, where available, a preferred mode especially for container transports. European container traffic on inland waterways is highly driven by the three largest European ports: Rotterdam, Antwerp and Hamburg.

For oil and gas, pipelines are mostly used, especially for short distances. 4.8% of all tonne-kilometres of transport go by pipeline.

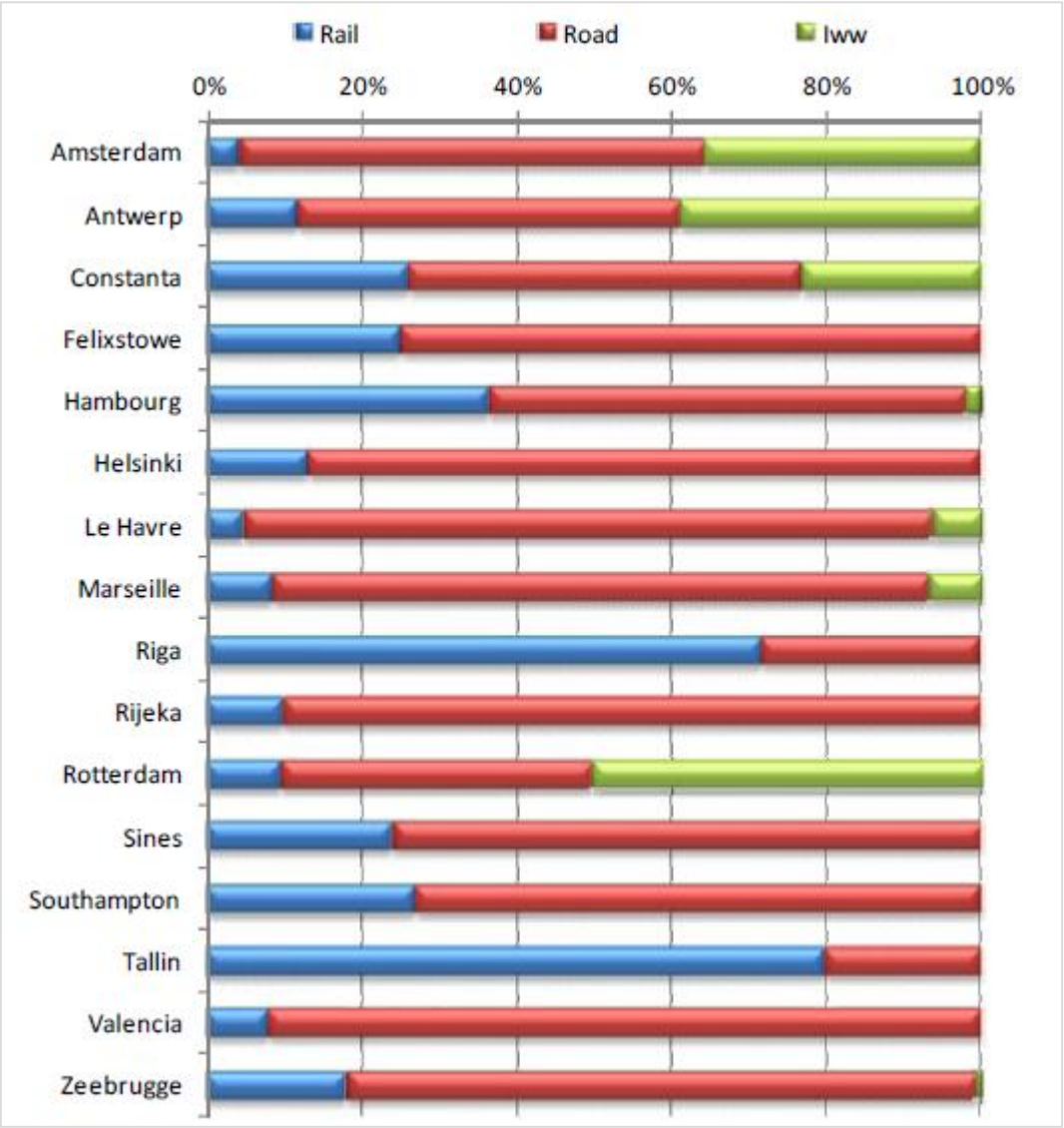

Figure 10-19: Modal Split share in selected Seaports (Overall Throughput in 2013)[174]

[174] European Parliament; Directorate General for Internal Policies, *Modal share of freight transports to and from EU ports*, 2015, p.38, http://www.europarl.europa.eu/RegData/etudes/STUD/2015/540350/IPOL_STU(2015)540350_EN.pdf