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PART 1/2

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT REPORT

Accompanying the document

PROPOSAL FOR A DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

amending Directive 2005/35/EC on ship-source pollution and on the introduction of penalties, including criminal penalties, for pollution offences

{COM(2023) 273 final} - {SEC(2023) 209 final} - {SWD(2023) 164 final}

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Glossary

Term or acronym	*Meaning or definition*
CSN	CleanSeaNet service - EMSA European satellite-based oil spill monitoring and vessel detection service
Detection	Any activity undertaken by national authorities or EMSA to notify on a possible illegal discharge into sea e.g. by satellite surveillance (CleanSeaNet), monitoring of the sea area by aerial and coastal surveillance (aircrafts and coastguard patrol boats).
Discharge	Discharge, jettisoning or disposal of polluting substances into sea.
ECD	Environmental Crime Directive
ECJ	European Court of Justice
EEZ	Exclusive Economic Zone
EMSA	European Maritime Safety Agency
Enforcement	Any activity undertaken by national authorities for the purpose of detection, verification or prosecution.
European seas	All maritime zones in the EU in accordance with the 1982 United Nations Convention on the Law of the Sea (UNCLOS Convention)
EU	European Union
IMO	International Maritime Organisation
MARPOL	The International Convention for the Prevention of Pollution from Ships of 1973 and the Protocol of 1978 as subsequently amended
PRF	Port Reception Facilities
Prosecution	Any activity undertaken by national authorities, under administrative or criminal law, deciding that the offender should be penalised by imposing a fine or other penalty or otherwise related court proceedings with regards to ship-source pollution offences, based on the evidence collected under the investigation of the incident and any additional evidence that will be brought in the relevant proceedings by the parties.
Scrubbers	Exhaust Gas Cleaning Systems, both open-loop and closed-loop. The discharge water from scrubbers, treated by the 2021 IMO Guidelines for Exhaust Gas Cleaning Systems as 'EGCS residues', are prohibited to be discharged overboard into sea.
SPP	Ship-Source Pollution
SSN	SafeSeaNet, the EU maritime information exchange system - vessel traffic monitoring and information as defined in Directive 2002/59/EC. It comprises a network of national SafeSeaNet systems in Member States and a central SafeSeaNet system acting as a nodal point managed by EMSA.

THETIS	EU Port State Control vessel inspection database
THETIS EU	EU Inspection Database to support inspections carried out under EU maritime safety and environmental legislation (other than Port State Control) e.g. Port Reception Facilities Directive 2019/883/EU
UNCLOS	United Nations Convention on the Law of the Sea
Verification	Any activity undertaken to check if a discharge took place at sea e.g. coastguard dispatch to the site. The definition of verification for the purpose of this report excludes inspections at ports.

1. INTRODUCTION: POLITICAL AND LEGAL CONTEXT

This Impact Assessment accompanies a legislative proposal for a revision of *Directive 2005/35/EC on ship-source pollution and on the introduction of penalties, including criminal penalties, for pollution offences* as amended by Directive 2009/123/EC (hereinafter "the SSP Directive" or "the Directive"). The Directive is one of EU's initiatives aiming at **less pollution to the sea from maritime transport.**

The Directive is one of the building blocks of the EU maritime safety acquis which helps to prevent pollution to the sea from maritime transport. Maritime transport is a key sector for the EU economy as it embodies the main transport mode for European imports and exports to the rest of the world. Maritime transport is estimated to carry around 80% of worldwide goods transported and around 30% of intra-EU transport activity[1]. In 2019, 1.9 billon tonnes were transported by sea to/from the main EU ports. In addition, 418 million passengers aboard ferries and cruise vessels embarked and disembarked in EU ports in 2019.

Although the maritime sector brings substantial economic and social benefits to the EU, it also has an impact on the environment. Ships may cause pollution of the sea through accidents and (intentional) operational discharge. Oil spills are a concerning source of marine pollution, as they are difficult to clean up and can last for long periods of time in the marine environment. The cargo and fuel carried by vessels can be a threat to the marine environment in case of an accident. Other polluting substances released by ships, accidently or intentionally, such as garbage and sewage also have a negative effect on the sea. They can severely pollute marine and coastal habitats, causing damage to the natural environment and have a negative impact on the economy[2]. Although maritime accidents are a prominent source of ship-source pollution, the majority of pollution comes from deliberate discharges, such as tank-cleaning operations and waste discharges. Not all of these sources of pollution are in the scope of the SSP Directive.

Currently, the SSP Directive tackles the illegal discharges of oil and noxious substances. Not all waste that is generated on board of the ships has to be delivered to the ports. Some can be discharged into the sea. Tank-cleaning operations are also in principle allowed. The Directive defines an illegal discharge as a discharge from a ship that does not meet the relevant international standards. The Directive tackles the problem of illegal discharges by incorporating the international standards and penalising a ship that does not comply with those standards. The level of ambition of the Directive is framed by the international standards and the developments in the international arena. The Directive does not set EU standards for protecting the marine environment from polluting substances. The SSP Directive was designed to address the missing link between the cause of certain pollution of the sea and the accountability of the persons responsible for it, while taking into account the specific characteristics of the judicial systems of the Member States.

This initiative aims to ensure that the response of Member States to certain pollution incidents is dissuasive by making this response more effective (e.g. through strong surveillance processes, EU information exchange mechanisms, Member State cooperation in verification and prosecution), and to address more types of polluting substances/ waste categories in line with developments at international level. In other words, the aim of the initiative is to support Member States in their timely response i.e. detection of illegal discharges and the identification of polluters. It should foster verification (e.g. evidence collection) and principally increase effective prosecution and penalising.

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1 European Commission (2021), The EU Blue Economy Report 2021.

2 European Maritime Safety Agency and European Environment Agency, 2021, European Maritime Transport Environmental Report (EMTER)

At the time of adoption of Directive (EU) 2019/883 on Port Reception Facilities[3] (the delivery of waste from ships in ports), the co-legislators called for a revision of the SSP Directive, as the tool to prevent pollution to the sea, and which dovetails with the efforts to ensure adequate reception facilities for waste from ships in ports. The **Sustainable and Smart Mobility Strategy**[4] announced that "*efforts under the zero pollution ambition should be made to drastically reduce the broader environmental footprint from the sector […]"*. This revision should therefore contribute to delivering the zero pollution ambitions of the **European Green Deal**[5]. The Communication on the EU Action Plan 'Towards Zero Pollution for Air, Water and Soil'[6] underlined the need for preventing pollution and tackling threats to the health of people, animals and ecosystems[7].

The Directive contributes towards the objective "*to combat […] ocean pollution, including through […] promoting of environmentally friendly shipping by using best available technologies […]"* which has been underlined in the outcomes of the **Conference on the Future of Europe**[8] and towards the general objective to ensure a uniform level of maritime safety and environmental protection underlined by several Council conclusions and in particular those from 2017[9], 2020[10] and 2022[11].

The Directive also contributes towards Sustainable Development Goal (SDG) 14 *"Conserve and sustainably use the oceans, seas and marine resources for sustainable development"* which covers safeguarding marine and coastal ecosystems by preventing and reducing marine pollution. One of the goals (SDG 14.1) is to prevent and significantly reduce marine pollution of all kinds. The Directive also contributes towards SDG 3 (*"Ensure healthy lives and promote well-being for all at all ages")* and, with its provisions on prosecution, towards SDG 16 (*"Peace justice and strong institutions"*), as outlined in Annex 3.

International context

The Directive does not set standards for Member States/ship operators on the allowable quantity of discharge of pollutants. These standards are set at global level at the UN **International Maritime Organisation** (IMO)[12]. The Directive's focus is on applicable penalties for discharges that are not in line with these international standards.

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3 Directive (EU) 2019/883 of the European Parliament and of the Council of 17 April 2019 on port reception facilities for the delivery of waste from ships, amending Directive 2010/65/EU and repealing Directive 2000/59/EC (OJ L 151, 7.6.2019, p. 116–142)

4 COM(2020) 789 final - Sustainable and Smart Mobility Strategy – putting European transport on track for the future; FLAGSHIP 2 –Creating zero-emission airports and ports, point 27. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789

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

6 https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52021DC0400

7 The 'One Health' approach calls for action to mobilise sectors, disciplines and communities to foster well-being and tackle threats to the health of people, animals and ecosystems, as well as taking action on climate change, and contributing to sustainable development.

8 Conference on the Future of Europe. Report on the final outcome. Proposal 2, measure 7

9 "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"

10 "EU Waterborne Transport Sector – Future outlook: Towards a carbon-neutral, zero accidents, automated and competitive EU Waterborne Transport Sector"

11 Joint Communication on the EU's International Ocean Governance agenda

12 International Maritime Organization (imo.org) is a United Nations specialised agency; all EU Member States are IMO members. The European Union cannot be a member but the Commission holds observer status as an Intergovernmental Organisation.

Due to its history and cross-border nature, maritime transport has developed a specific regulatory structure. The IMO developed its International Convention for the Prevention of Pollution from Ships[13] (**MARPOL**). MARPOL has six annexes covering various categories of pollutants as presented in Table 1. The MARPOL Convention provides rules to determine what type and quantity of pollutants a ship is allowed to dispose of at sea and what is an illegal discharge. While MARPOL outlines the rules to follow, enforcement responsibilities and the development of tools for dealing with non-complying ships is left to the IMO parties. MARPOL (Article 4(4)) encourages States to adopt adequate penalties for ship-source pollution violations without however specifying the nature of such penalties. All EU Member States are parties to MARPOL.

Table 1. Sources of marine pollution covered by the MARPOL Convention

Sources of marine pollution covered by the MARPOL Convention
Oil (Annex I)
Noxious liquid substances (HNS) in bulk (Annex II)
Harmful substances carried by sea in packaged form (Annex III)
Sewage from ships (Annex IV)
Garbage from ships (Annex V)
Air pollution from ships (Annex VI)

Source: IMO

More specifically, MARPOL annexes include standards, such as:

- Annex I – it is illegal if a ship discharges **oil** with concentration above 15 ppm (parts per million)[14];
- Annex II – it is illegal if a ship discharges **noxious liquid substances** at a rate exceeding the maximum rate for which the underwater discharge outlets were designed[15];
- Annex III – it is illegal if a ship jettisons **harmful substances in packaged form** where it is not necessary for securing the safety of the ship or saving life at sea[16];
- Annex IV – it is illegal if a ship discharges **sewage** which is not pre-treated[17];
- Annex V – it is illegal if a ship discharges **garbage** food waste, which cannot pass through a screen with openings less than 25 mm[18];
- Annex VI – a ship cannot release **scrubber discharge water** into sea which do not comply with the criteria set in guidelines e.g. pH, PAH, turbidity, nitrates and water additives criteria[19].

EU context

The policies on preventing pollution from ships were developed between 2000 and 2009, in the wake of two major maritime accidents of the ships **Erika** and **Prestige** causing substantial oil

[13] https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx

[14] This applies to tankers above 400 GT while en route outside a special area, for oil, which originates from cargo pump room bilges and has not been processed through oil filtering equipment.

[15] This applies to ships while en route at a speed less than 7 knots discharging residues of noxious liquid substances in Category X, Y or Z (as per the International Bulk Chemical Code) at a distance less than 12 nautical miles from the nearest land and in a depth of water less than 25 meters.

[16] This applies to the jettisoning of packaged goods as per the International Maritime Dangerous Goods Code.

[17] This applies to ships while en route at a speed less than 4 knots and at a distance less than 12 nautical miles from the nearest land, instantaneously discharging sewage held in holding tanks, which is not comminuted or disinfected.

[18] This applies to ships while en route within a special area at a distance less than 12 nautical miles from the nearest land and for food waste which was not comminuted or grounded.

[19] In accordance with the 2021 IMO Guidelines for Exhaust Gas Cleaning Systems

spills[20]. The lack of rules on the prevention of pollution from ships represented a void in EU legislation at the time. The Port Reception Facilities Directive and the Port State Control Directive[21] covered pollution from ships, but there were no rules making the actual act of pollution illegal under EU law.

The legislative proposal for the SSP Directive[22] was adopted in only four months after the oil spill from the Prestige. At the time of the adoption, there was significant political will and public pressure to act quickly in the field of ship-source pollution prevention. The proposed initiative's scope was oil and noxious substances (i.e. the first two out of the six MARPOL Annexes) because these two pollutant types were of greatest concern at the time of adoption.

The SSP Directive addresses illegal discharges of oil (Annex I) and noxious substances (Annex II) from ships into the sea. 'Illegal' in this context refers to accidental or intentional discharges that do not meet MARPOL standards. The standards from MARPOL are mirrored in the Directive (Article 5). Illegal discharges by ships must result in the EU in **penalties for the pollution offence**, thereby preventing/discouraging illegal discharges and consequently ensuring safety and environmental protection in maritime transport.

The overall objective is a Union policy on safe seas also to discourage the pollution from ships into sea. EU legislation in the maritime field usually incorporates IMO standards in order to ensure their proper enforcement. EU action in the field of preventing pollution from ships both complements and enforces the international framework as defined within IMO. The transposition of IMO rules into the EU legal system makes these provisions actionable before the European Court of Justice (ECJ). National governments can be taken to court if they break EU law, and this helps to ensure that enforcement across the Union is uniform. The same principle applies to all legislation of the maritime acquis e.g. Port State Control Directive, Flag State Control Directive, Accident Investigation Directive.

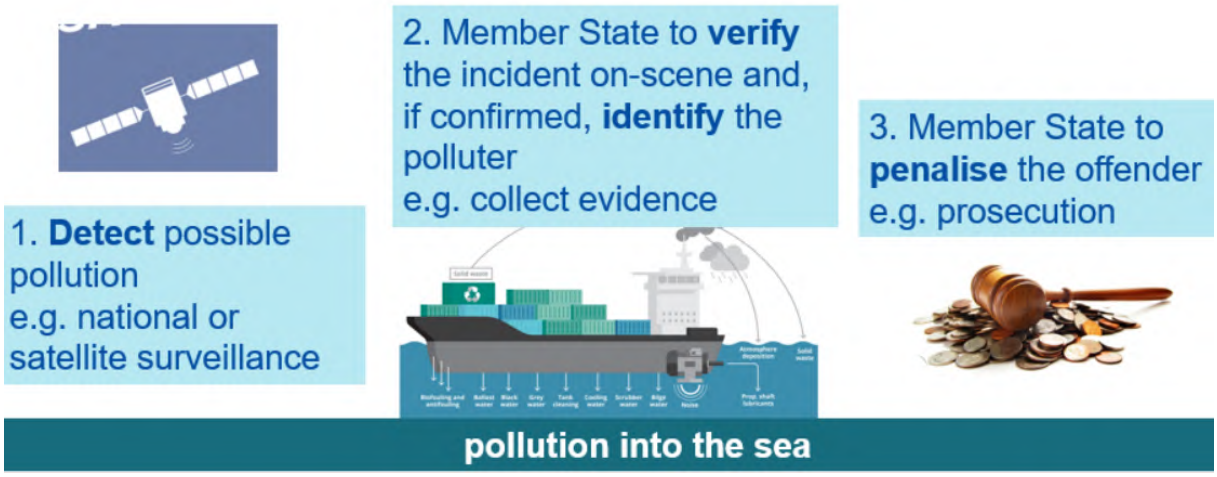
The SSP Directive incorporates the international ship-source pollution standards set by the MARPOL Convention into EU law and requires Member States to take enforcement measures in specific situations and to introduce effective, proportionate and dissuasive penalties (Article 8 of the Directive). Figure 1 depicts these measures and the enforcement chain in the Directive.

Figure 1. Law enforcement chain in the SSP Directive

[20] MV Erika accident in 1999, France (20,000 tonnes of oil), MV Prestige accident in November 2002, Spain (63,000 tonnes of oil).

[21] Directive 2009/16/EC of the European Parliament and of the Council of 23 April 2009 on port State control (OJ L 131 28.5.2009, p. 57)

[22] Proposal for a Directive of the European Parliament and of the Council on ship-source pollution and on the introduction of sanctions, including criminal sanctions, for pollution offences, COM/2003/0092 final - COD 2003/0037



The SSP Directive not only incorporates international standards. It additionally offers to the Member States information on the detection of possible spills (CleanSeaNet). It also makes the international framework clearer by establishing an EU liability regime[23]. Furthermore, the Directive established EU competence in criminal matters. At the time of the Directive's adoption, there was no criminal competence of the EU. The approach to criminal penalties has evolved over time in the EU through framework decisions, court cases and most recently through the revision of the Environmental Crime Directive[24] (see the section below on *synergies* for information on the Environmental Crime Directive).

While the situation in the EU has considerably improved since the times of the Erika and the Prestige accidents with no major oil spill in EU waters since 2002, the problem identified when Directive 2005/35/EC was adopted is still relevant. Illegal discharges from ships continue to happen in European seas. Drawing on the findings of the evaluation, the legislative proposal for the revision of the SSP Directive aims to further incorporate international substantive rules by extending the scope of the Directive to cover all MARPOL Annexes. In addition, the revision aims to complement the international framework by providing further clarification of the existing EU liability regime, in particular with regards to exceptions from liability, further strengthening of the existing information and experience exchange as well as introduce new measures on types and levels of penalties which will help Member States better enforce the requirements of the MARPOL Convention.

Synergies with other EU policy instruments

The relevant EU policy instruments addressing water-based pollution and waste management are described in this section. The evaluation concluded that the Directive needs to be adapted to the changes resulting from new legislation, in particular in the context of the Environmental Crime Directive and the Port Reception Facilities Directive.

[23] For the purpose of this report the 'EU liability regime' relates to persons (natural or legal) being held accountable for an illegal discharge - for example, the company or master of the ship is responsible for an illegal discharge if committed carelessly or with the intention to cause damage, subject to the exceptions from liability provided by MARPOL.

[24] Directive 2008/99/EC of the European Parliament and of the Council of 19 November 2008 on the protection of the environment through criminal law (OJ L 328, 6.12.2008, p. 28–37)

The **Environmental Crime Directive**[25] (ECD) lays down a list of environmental offences that Member States must consider as criminal offences. Ship-source pollution criminal offences are currently not covered by the ECD. In 2021, the Commission adopted a proposal for a new ECD[26], which covers for the first time SSP infringements. This is to align with the post-Lisbon legal basis for harmonisation of criminal law (Article 83(2) TFEU[27]). The proposal for a new ECD foresees transferring the description of the criminal offence from the SSP Directive to the ECD. The criminal offence for ship-source pollution, as defined in the proposal for a new ECD, mirrors the offence description of the current SSP Directive. Consequently, the criminal provisions in the SSP Directive will cease to apply and therefore will need to be removed from the SSP Directive. The SSP Directive will continue to include the sectorial provisions (e.g. on the definitions of illegal discharges considered as infringements) and provide for administrative penalties for ship-source pollution when the act will not qualify for criminal proceedings. The ECD and the SSP Directive would therefore work in a complementary fashion.

The **Port Reception Facilities Directive**[28] (PRF) imposes requirements for the delivery of waste from ships to ports. The PRF Directive aims at maximising the delivery of waste from ships through economic incentives (cost recovery systems) and enforcement. Ships have to report their advance waste notifications and waste delivery receipts, which form the basis for inspections recorded in an EU database called THETIS EU[29]. The SSP Directive complements the PRF Directive. While the PRF Directive implements the proper collection and management of waste, the SSP Directive discourages the illegal discharge of such waste into sea. The PRF Directive's delivery obligation mirrors that of the discharge prohibitions in MARPOL and covers Annex I-II as well as IV-VI[30]. Hence, there is a need to bring the scope of the two directives closer so that the SSP Directive covers all discharges into the sea covered by the MARPOL Annexes. The SSP Directive and PRF Directive are instruments that work together and are designed to address the prevention of discharges from ships into sea.

At the same time, the Commission is undergoing a review of existing EU maritime safety directives: 1) **Flag State Control Directive**[31], 2) **Port State Control Directive**[32] and 3) **Accident**

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[25] Directive 2008/99/EC of the European Parliament and of the Council of 19 November 2008 on the protection of the environment through criminal law (OJ L 328, 6.12.2008, p. 28–37)

[26] European Commission proposal for a revised Environmental Crime Directive https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12779-Environmental-crime-improving-EU-rules-on-environmental-protection-through-criminal-law_en

[27] Article 83(2) TFEU: If the approximation of criminal laws and regulations of the Member States proves essential to ensure the effective implementation of a Union policy in an area which has been subject to harmonisation measures, directives may establish minimum rules with regard to the definition of criminal offences and sanctions in the area concerned. Such directives shall be adopted by the same ordinary or special legislative procedure as was followed for the adoption of the harmonisation measures in question, without prejudice to Article 76.

[28] Directive (EU) 2019/883 of the European Parliament and of the Council of 17 April 2019 on port reception facilities for the delivery of waste from ships, amending Directive 2010/65/EU and repealing Directive 2000/59/EC (OJ L 151, 7.6.2019, p. 116–142)

[29] THETIS EU is an EU digital tool for recording and managing data on inspections of ships other than Port State Control and has a module on waste delivery from ships.

[30] Annex III is not covered because packaged goods are not waste.

[31] Directive 2009/21/EC of the European Parliament and of the Council of 23 April 2009 on compliance with flag State requirements (OJ L 131, 28.5.2009, p. 132–135)

[32] Directive 2009/16/EC of the European Parliament and of the Council of 23 April 2009 on port State control (OJ L 131 28.5.2009, p. 57)

Investigation Directive[33] . There are links with the SSP Directive in the context of 1) the responsibilities of the flag State to impose penalties for illegal discharge from its own flagged ships, 2) the responsibilities of the port State to inspect related cases and 3) accidents involving pollution incidents. The SSP Directive complements the three directives by provisions on the imposition of penalties to cases of related ship-source pollution.

There are also synergies between the satellite surveillance services used for the SSP Directive (CleanSeaNet) and the targeting and reporting system for port State control (THETIS). For example, through THETIS, Member State authorities have access to past port State control inspection findings for ships and can use this information to assess whether a ship is suspected of an illegal discharge. Member States can also use THETIS to request another Member States authority (e.g. next port of call) to inspect the suspect ship.[34]

The **Vessel Traffic Monitoring and Information System Directive**[35] (VTMIS) together with its SafeSeaNet tool is essential to have information on ships suspected of an illegal discharge. For example, SafeSeaNet records ships' identifiers and geographical position. This information can be extracted for a certain geographical area where a possible pollution incident took place and is transferred to CleanSeaNet. This provides information to the Member States to support them in identifying the offender.

In addition, the **Whistleblowing Directive**[36] lays down standards for reporting channels and the protection of persons reporting the breaches of Union law. SSP Directive is part of the scope of application of the Whistleblowing Directive and there are synergies between the two as whistle-blowers can be a relevant source of information on ship-source pollution.

The **Waste Framework Directive**[37] lays down the main waste management principles and includes a common EU definition of waste. Any substance or object, which the holder discards (or intends or is required to discard) is considered as waste. 'Polluting substances' as defined in the SSP Directive are regulated by international standards set in the MARPOL Convention. Operational discharges of waste generated on board ships and that contain such substances are permitted within the strict discharge standards of MARPOL. The obligations under the Waste Framework Directive apply to the management of waste from ships covered by the Port Reception Facilities Directive.

The **Marine Strategy Framework Directive**[38] (MSFD) has as its main objective to protect the marine environment and to achieve Good Environmental Status of EU Marine Waters which is measured by means of so-called 'descriptors'. Descriptor 8 on contaminants and descriptor 10 on marine litter are both relevant for the SSP Directive. The MSFD is the main European legal

[33] Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009 establishing the fundamental principles governing the investigation of accidents in the maritime transport sector and amending Council Directive 1999/35/EC and Directive 2002/59/EC of the European Parliament and of the Council (OJ L 131, 28.5.2009, p. 114–127)

[34] In case an illegal discharge is considered a serious factor and a ship is suspected of pollution, the Member State can use THETIS to trigger a mandatory inspection at the next port of call.

[35] 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 and repealing Council Directive 93/75/EEC (OJ L 208 5.8.2002, p. 10)

[36] Directive (EU) 2019/1937 of the European Parliament and of the Council of 23 October 2019 on the protection of persons who report breaches of Union law

[37] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (OJ L 312 22.11.2008, p. 3)

[38] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (OJ L 164 25.6.2008, p. 19)

instrument for conserving the marine environment and ecosystems. The Directive enshrines in its rules the ecosystem approach to the management of human activities having an impact on the marine environment, integrating the concepts of environmental protection and sustainable use. The SSP Directive contributes to reaching the objectives of the MSFD by introducing dissuasive penalties for illegal discharge of polluting substances to the sea by ships.

There is no interaction between the SSP Directive and the EU air emission legislation and no regulatory gap has been identified in the context of this impact assessment. The current SSP Directive and the Port Reception Facilities Directive work together to cover pollution into sea. The revision of the SSP Directive aims at maintaining the same legal logic of prosecuting discharges of substances under MARPOL Annexes into sea.

The Directive does not cover air emissions because they traditionally follow a different regulatory approach (further detailed in Annex 5). Reducing the continuous emitting of polluting substances or greenhouse gasses into the atmosphere when en route is regulated differently than discouraging one-off illegal spills/offences by ships. Therefore, different structures for enforcement have been adopted. However, synergies may exist and be reinforced, e.g. through the use of IT tools such as THETIS-EU, with respect to exchange of and access to information concerning ship inspections of ships and enforcement actions across Member States and on the basis of various legal texts.

The current and proposed initiatives at EU level for air emissions are:

– administrative penalties under the Sulphur Directive[39] to discourage sulphur oxide (SOx) emissions triggered by use of non-compliant fuel;

– obligation for shipping companies to monitor, report and verify their annual greenhouse gas (GHG) emissions in accordance with the revised EU MRV Regulation (Regulation (EU) 2015/757);

– obligation for shipping companies to surrender emission allowances for the carbon dioxide (CO_2) – as well as from nitrous oxide (N_2O) and methane (CH_4) as of 2026 – they emit, following the inclusion of shipping under the EU Emission Trading System (ETS); and

– obligation for shipping companies to reduce the average annual greenhouse gas (GHG) intensity of energy used by ships below the maximum limit set under the FuelEU Maritime legislative proposal.

Nitrogen oxide (NOx) emissions by the shipping sector, although addressed at IMO level[40], are not regulated by dedicated EU legislation[41]. In EU, currently efforts are made to collect data and enhance monitoring of NOx emissions from shipping, with substantial contribution from EMSA.

Elements falling outside the proposed revision are:

- air pollutants to the atmosphere covered by MARPOL Annex VI; and

[39] Directive (EU) 2016/802 of the European Parliament and of the Council of 11 May 2016 relating to a reduction in the sulphur content of certain liquid fuels (OJ L 132, 21.5.2016, p. 58–78)

[40] An international certification regime for NOx exists and applies to all EU Member States as parties to MARPOL https://www.imo.org/en/OurWork/Environment/Pages/Nitrogen-oxides-(NOx)-%E2%80%93-Regulation-13.aspx

[41] Directive 2008/50/EC on Ambient Air Quality sets limit values for NO2

- pollutants not covered by standards set in MARPOL.

See the discarded measures in section 5.3 and Annex 5 for a description of these elements.

Evaluation of the Directive

The Commission has carried out an evaluation of the SSP Directive in a so-called 'back-to-back' manner (i.e. the evaluation and impact assessment have been launched at the same time). The links between the conclusions of the ex-post evaluation and the impact assessment are summarised in Table 2.. The evaluation of the SSP Directive is annexed to this impact assessment report.

The data available for the evaluation was not sufficiently robust to make a complete ex-post assessment for all Member States. There was no representative data available on the indicators to measure the success of the Directive. Despite the limitations, the evaluation gave a snapshot of the existing information on the implementation of the Directive.

The evaluation concluded that the objectives of the Directive were not fully achieved and the scope of the Directive is limited. The Directive defined a common legal framework for ship-source pollution offences in the EU but its effectiveness was limited. There were two cases of nonconformity investigated by the Commission - in 2009 (infringement against Greece[42]) and in 2010 (infringement against Ireland[43]). Both cases were closed in 2011. The Directive brought the MARPOL rules into the realm of EU law and ensured that the legislation of the Member States is aligned but it is unclear if pollution was discouraged in practice.

Table 2. Links between conclusions of the ex-post evaluation and the impact assessment

Main ex-post evaluation conclusions	Impact Assessment
Conclusions on effectiveness	
The success of the Directive in achieving its intended objectives has been limited. Although it incorporated international rules for ship-source pollution into EU law and Member States prosecute SSP offenders, there is limited data to show how effective the system is. The Directive resulted in the implementation of a successful tool for satellite surveillance (CleanSeaNet). This however does not solve the problem entirely because satellite surveillance accuracy is limited (to around 40%). Some aspects relating to verification could have been managed more effectively e.g. Member States could have been voluntarily logging more feedback data in CleanSeaNet. The Directive has not achieved the anticipated outcome to its full when it comes to the prosecution of offenders.	Policy measures are defined to maintain the philosophy and architecture of the current Directive while tapping into modern digital solutions and keep the Directive up to date with developments at international and EU level as to effectively reach the objective ensuring that persons responsible for discharges of polluting substances into sea are subject to dissuasive, proportionate and effective penalties.
Conclusions on efficiency	
The data on costs is scarce and no quantitative information on benefits is available. The benefits seem to overweigh the costs of the Directive, although they could not be quantified and thus the uncertainty associated to them is acknowledged. The EMSA tools proved to be efficient and beneficial for Member States in the context of achieving the objectives of the Directive. Increased satellite surveillance contributes to enhanced illegal discharge detection and indirectly to the prevention of ship-source pollution of the marine environment.	Policy measures are defined to support Member States in discharging their enforcement responsibilities efficiently (identify the polluter and prosecute the offender) and to reduce the burden on the Member States with the support of common, integrated, cost-efficient EMSA tools.

[42] In 2009, Greece's legislation conformity with the SSP Directive was challenged with regard to Article 3 (insufficient definition of infringement outside Greek territorial waters) and Article 6 (inspection of suspect ships). The case was closed in 2011.

[43] In 2010, Ireland's legislation application with respect to the SSP Directive was challenged with regard to Article 8 (liable persons other than the owner and master of ship) and was closed in 2011.

Main ex-post evaluation conclusions	Impact Assessment
Conclusions on coherence	
No major inconsistencies have been identified between the Directive and other interventions in place at EU level, however there is a need to update the Directive, in particular due to the revision of the Port Reception Facilities Directive, in the context of the extended scope of the directive (to add the remaining MARPOL Annexes) and due to the revision of the Environmental Crime Directive in the context of removing criminal penalties. As for coherence with the international regime, a Directive covering all MARPOL Annexes would have been a better fit to meet the international objectives and expand the enforcement regime at EU level to penalise illicit conducts other than those covered under Annexes I and II of MARPOL. Such approach would be coherent with the objectives of the wider policy framework as reflected in the European Green Deal.	Policy measures are defined to keep the Directive coherent with developments at international and EU level. The revision must also align with the new Environmental Crime Directive by removing provisions on criminal penalties from the SSP Directive.
Conclusions on EU added value	
The Directive, as an EU-level intervention, brought benefits, which would have not been possible at national or international level alone. The Directive was more efficient and effective in addressing ship-source pollution than MARPOL requirements and its implementing measures alone. The Directive offers added value by the additional elements to support the prevention of ship-source pollution. Specifically, the Directive introduced the regime for pollution penalties (i.e. EU liability regime) and introduced a common tool to all Member States to inform on possible spills (CleanSeaNet). The difference the SSP Directive made is minimising both the discrepancies in the EU as well as the enforcement gap for the implementation of the MARPOL Convention.	EU action continues to be needed to deliver on the policy objectives.
Conclusions on relevance	
The overall problem addressed by the Directive and related objectives are still adequate. In addition, the policy context has evolved and adjustments are needed to adapt to the more ambitious agenda on pollution prevention. The substances covered by MARPOL Annex III-VI discharged into the sea are harmful to the environment and need attention as to deliver on EU policy objectives. The objective of the EU citizens and Member States "*to combat* […] *ocean pollution, including through* […] *promoting of environmentally friendly shipping by using best available technologies* […]" has been underlined in the outcomes of the Conference on the Future of Europe. The needs and objectives of the wider policy framework and the EU goal towards zero pollution, as reflected in the European Green Deal must be considered in this context.	Policy measures are defined to keep the Directive relevant and up to date, particularly by extending the scope of the Directive (substances covered by MARPOL Annex III-VI).

2. PROBLEM DEFINITION

2.1. What is the problem?

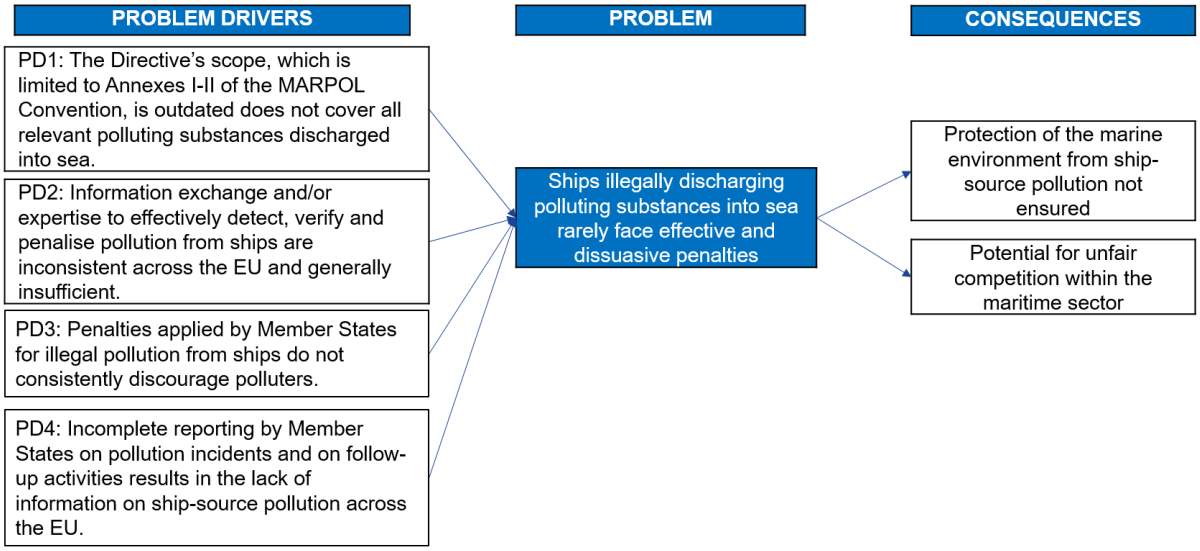
Problem – Ships illegally discharging polluting substances into sea rarely face effective and dissuasive penalties.

The first line of defence for the maritime safety and pollution prevention is provided through flag State (Flag State Control Directive) and the second line of defence through port State control legislation (Port State Control Directive), however, ships may still cause pollution of the sea through accidents and/or (intentional) operational discharges. Hence there is a need for another line of defence which is prosecuting the offenders. Drawing on the conclusions of the evaluation, the problem identified when Directive 2005/35/EC was adopted is still relevant. Illegal discharges occur in European waters i.e. ships which discharge polluting substances do not always follow MARPOL standards. This is an issue of concern because illegal discharges from the maritime

transport sector contribute to the damage of the marine environment and its ecosystems. The problem and the underlying problem drivers are presented in Figure 2.

The success of the Directive would mean that the person (legal or natural) responsible for the pollution of the sea is adequately penalised to produce a deterrent effect and this way prevent pollution in the future. SSP penalties can be seen as the last line of defence for pollution prevention of the marine environment. The measure of success of the Directive would therefore be an increased proportion of confirmed illegal discharges from ships that are subject to penalties.

Figure 2. The problem tree



Due to serious limitations of data underpinning the evaluative work, there is only fragmented data to confirm that ships which discharge pollutants into sea illegally face effective and dissuasive penalties for such offence. Therefore, only an indicative and qualitative summary of the implementation of the current Directive by Member States is available.

Some scarce information is available on pollutants which ships discharge illegally into sea. Regarding volumes of Annex I discharges, around 31,000 m^3 of oily waste (2.5% of the total for oily waste from ships) was likely illegally discharged in European waters over the 2011-2015 period.[44] Regarding volumes of Annex II discharges, the quantities of substances transported yet spilled are not available. Reported data shows that hazardous and noxious substance spills happen in European seas (e.g. HELCOM data of 2017[45]; OSPAR data of 2020[46]; REMPEC data of 2021[47]) but there is little information on the extent and frequency of those spills at sea.

There is no complete dataset on the number of prosecutions and the penalties imposed. The information reported to the Commission by Member States on the implementation of the SSP Directive (Article 12 reporting) shows that up to 51 offenders are identified per year by a Member

[44] European Commission (2018). Commission staff working document, Impact Assessment on port reception facilities for the delivery of waste from ships .
The information of 2018 is still considered as up-to-date and reflecting the current situation (year 2023).

[45] HELCOM (2017) Annual report on discharges observed during aerial surveillance in the Baltic Sea

[46] OSPAR (2020) Assessment of the OSPAR Report on Discharges, Spills and Emissions from Offshore Installations 2009 – 2018

[47] REMPEC (2021) Study on trends and outlook on marine pollution, maritime traffic and offshore activities in the Mediterranean. REMPEC/WG.51/INF.3

State and up to 12 offenders are prosecuted (see Table 3.). These numbers however are not representative for the situation across the EU because not all Member States report[48]. Nevertheless, based on this data, it can be considered that penalties and prosecution are rare.

Table 3. Summary of data reported by Member States in the period 2015-2020

Member State which submitted a report	Average number of offenders/ships identified annually	Average number of offenders/ships prosecuted annually
FR	5.8	No data
PL	18.0	12.1
LV	2.7	2.7
FI	16.2	3.2
RO	1.7	1.7
CY	1.3 (data for 2020, 2018, 2015)	2 (only data for 2020)
DE	50.8	No data
NL	30	No data

Source: Reports submitted to the European Commission by Member States in 2015-2020.

One of the reasons for penalties being rare can be attributed to the weaknesses in the SSP enforcement chain i.e. detection, verification, prosecution. Member State public authorities are responsible for enforcement yet have limited capacity to verify the potential spills (see Figure 5 in section 2.2). The decision and responsibility to undertake a check remains the prerogative of the respective Member State.

The actors responsible for and contributing to the pollution of the sea are the EU and non-EU maritime legal and natural persons i.e. ship operators, managers, owners, masters, crew etc. who illegally discharge polluting substances from their ships into sea deliberately. These legal persons are usually large enterprises and less so micro, small and medium-sized enterprises (SMEs). These actors cover all types of ships, irrespective of their flag, calling at EU ports or in transit through European seas.

The problem has a cross-border dimension because pollution is by nature cross-boundary and the detection and verification of ship-source pollution relies on efficient collaboration between Member States, as well as on the harmonised information exchange tools and aligned legal frameworks amongst Member States.

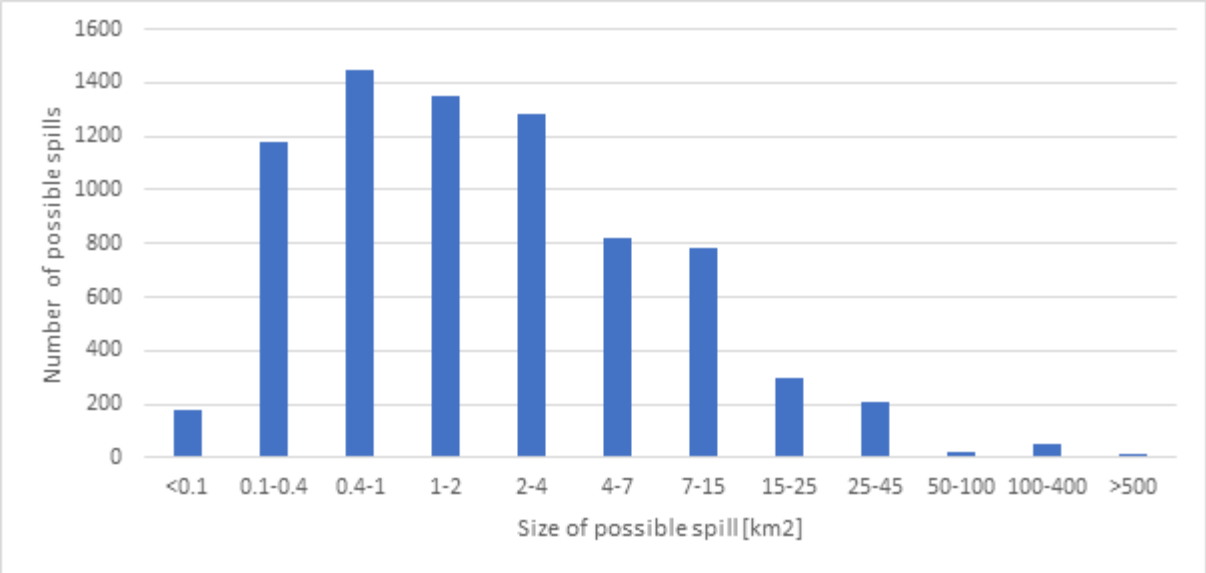
Ship-source pollution is not the only (nor is it even the main) pollution source affecting the marine environment and the European citizens that live along the sea; however, it is a contributing factor and therefore a problem to be addressed. Around 35% of oil that enters the sea comes from regular shipping operations.[49] Around 45% of oil is input from land-based sources with municipal/industrial effluents and from routine oil rig operations, 10% from accidents of oil tankers, 5% natural sources, 5% undefined sources.

The size of possible spills has changed over the years since the adoption of the Directive in 2005. Large accidental spills have not occurred in European seas since the accident of Prestige in 2002 (63,000 tonnes of oil which impacted more than 200 kilometres of the coast). As shown in Figure 3, small operational discharges are currently more likely to happen. The estimation is based on information from CleanSeaNet on possible spills. It shows that spills in European waters are of smaller size (mostly below 4 km^2).

[48] The number of prosecutions and penalties imposed would largely depend on the size of the territorial waters and Exclusive Economic Zone (EEZ).

[49] World Ocean Review (2014) WOR 3 Marine Resources – Opportunities and Risks. Oiling the Oceans

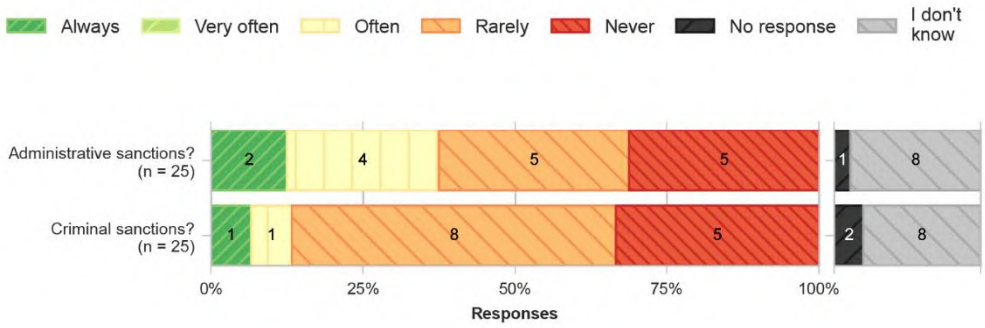
Figure 3. Number of possible spills detected by means of CleanSeaNet in 2020



Source: CleanSeaNet statistics 2020

Stakeholders, when consulted on the frequency of imposing penalties, confirmed that penalties are rare. 18 out 28 stakeholders interviewed agreed with the overall definition of the problem.[50] For illegal discharge incidents by natural persons, 10 of the 25 respondents to the targeted survey (see Figure 4 and note the 'I don't know' replies) indicated that administrative penalties imposed when prosecuting ship-source pollution are rarely or never imposed, while 13 of the 25 respondents stated that criminal penalties are rarely or never imposed. For illegal discharge incidents by legal persons, 8 of the 25 respondents indicated that administrative penalties are rarely or never imposed, while 11 of the 25 respondents answered that criminal penalties are rarely or never imposed.

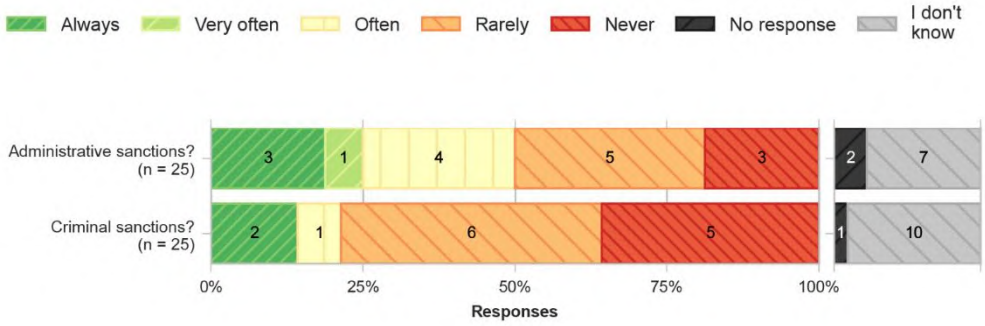
Figure 4. Stakeholder answers to survey questions on problem definition
Question: Are penalties imposed in the case of identified incidents of illegal discharges from ships ***for natural persons*** *(ship crew, ship masters)?*



Source: Targeted stakeholders' survey

[50] This includes eight out of 12 of the Member State authorities taking part in the Impact Assessment targeted interviews.

*Question: Are penalties imposed in the case of identified incidents of illegal discharges from ships **for legal persons** (non-human, juridical person as enterprises and entities with legal personhood)?*



Source: Targeted stakeholders' survey

Although there is a significant data gap and limited evidence available that ships actually face penalties for illegal discharges, the indicative data presented in this section shows that spills occur (Figure 3) and even in those cases where the polluting ship is identified, the offender is not always penalised (Table 3). The evaluation concluded that the success of the Directive in achieving its intended objectives has been limited.

2.2. What are the problem drivers?

Problem Driver 1: The Directive's scope, which is limited to Annexes I-II of the MARPOL Convention, is outdated and does not cover all relevant polluting substances discharged into sea

The Directive's scope is currently Annexes I and II of the MARPOL Convention (i.e. oil and noxious liquid substances in bulk) and does not cover Annex III for harmful substances carried by sea in packaged form, Annex IV for sewage, Annex V for garbage and Annex VI for discharge water from scrubbers. Drawing on the conclusions of the evaluation on relevance and coherence, the Directive is only partially relevant and aligned with the objectives of the European Green Deal due to its limited scope in terms of substances covered.

During the stakeholder consultation process, 18 out of 28 stakeholders interviewed[51] agreed that the current scope of the Directive is a limitation hindering the achievement of the Directive's objectives. In a stakeholder workshop organised on 22 September 2022, 29 out of 51 participants that voted were of the opinion that the scope of the revised Directive must be extended.

The Port Reception Facilities Directive is by design complementary to the SSP Directive (see section 1). The PRF Directive, in its scope, covers all MARPOL Annexes with the exception of Annex III on substances carried in packaged form[52] and the air component of Annex VI[53]. There was a call by the co-legislators[54] to review the SSP Directive because the EU Port Reception Facilities cannot work properly without a good legal instrument to discourage illegal discharge of polluting substances at sea for all relevant MARPOL Annexes. This was the main trigger for the revision of the Directive.

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[51] Including 11 Member State authorities (BE, HR, CY, FI, DE, NL, RO, ES, LV, SE and one anonymous representative of Member State authorities).

[52] This is because packaged goods are not categorised as waste.

[53] For Annex VI, the PRF Directive covers the waste categories delivered to ports, including discharge water from scrubbers. It does not cover SOx, NOx, particulate matter (PM) and CO2 emissions released into atmosphere by ships.

[54] The PRF Directive included a recital 13 on the need for the review of the SSP Directive, in particular through an extension of its scope to cover more polluting substances.

The size of the discharges from ships of each type of polluting substances is not known due to a significant data gap but can be put in perspective by analysing quantities collected in Port Reception Facilities. Table 4 shows what substances are collected in ports - most of the waste collected in ports is oil followed by garbage. This does not mean that more oil is discharged illegally into the sea than garbage but it shows the relative quantities that are generated by ships when in the EU and collected in ports.

Table 4. Types of waste collected in 2019 in the EU Port Reception Facilities per MARPOL Annex type of polluting substance.

Waste	Oil (Annex I)	Noxious liquid in bulk (Annex II)	Substances in packages (Annex III)	Sewage (Annex IV)	Garbage (Annex V)	Discharge water from closed-loop scrubbers (Annex VI)
Amount [tonnes]	1,470,322	62,245	570	88,563	279,748	4,096
Percentage of total	77%	3.2%	0.3%	4.6%	14.7%	0.2%

Source: Reported by Euroshore members in 2021 and presented in EMSA and EEA report EMTER (2021)

Table 4 and the following description on the quantity of polluting substances discharged into sea provide details on the magnitude of the problem driver.

With reference to MARPOL Annex III on **harmful substances carried by sea in packaged form** there is limited data available on how much packaged harmful goods are lost at sea. Small volumes of such substances in packages are collected in Port Reception Facilities i.e. 0.3% of all waste collected as shown in Table 4. This does not exclude the possibility that goods containing harmful substances in packaged form are accidentally lost at sea and pollute the marine environment. Packaged goods by definition are not discharged intentionally because they are the product which is being transported and not the waste which is being generated by the ship.

Regarding MARPOL Annex IV on **sewage**, most of the ship-source sewage discharge into sea is legal, in line with MARPOL discharge norms. The Baltic Sea is an exception as the IMO designate it as a Special area under MARPOL Annex IV, meaning that discharge of sewage from passenger ships (including cruise ships) is prohibited. Based on the PRF Impact Assessment, the possible waste gap for sewage is estimated at 136,000 m^3, i.e. approximately 10% of the sewage that should be delivered on land is not received by Port Reception Facilities and might be therefore discharged illegally[55]. Limited volumes of sewage are collected in Port Reception Facilities i.e. below 5% of all waste collected as shown in Table 4.

MARPOL Annex V (**garbage**) regulates the discharge into the marine environment of plastic, domestic wastes, cooking oil, incinerator ashes, operational waste, fishing gear and animal carcasses generated during the normal operation of the ship and liable to be disposed of continuously or periodically. As shown in Table 4., volumes of garbage collected in Port Reception Facilities are approximately 15% of the total waste collected. Certain geographic areas and countries have been identified as being more vulnerable to the impacts of this type of ship-source pollution, owing to their proximity to shipping routes. For instance, in the North Sea or Aegean Sea, it is estimated that up to 25% of litter found on beaches, originates from ships, while in the Baltic Sea, this percentage

[55] European Commission (2018). Commission staff working document, Impact Assessment on port reception facilities for the delivery of waste from ships .
The information of 2018 is still considered as up-to-date and reflecting the current situation (year 2023).

accounts for up to 10% of litter found.[56] Approximately 60,000 to 300,000 tonnes, i.e. 7% to 34% of the total garbage was estimated not to be delivered annually to the EU ports[57]. This data could indicate that some of the garbage waste from ships not delivered for disposal at EU ports may have been illegally discharged at sea and contribute to the marine pollution.

Regarding MARPOL Annex VI, the substances relevant for the SSP Directive are not those emitted to the air (e.g. SOx, NOx) but those discharged into sea (i.e. **discharge water from scrubbers**[58]). Most ships use open-loop scrubbers and discharge the scrubber residue into sea[59]. Fewer ships use closed-loop scrubbers and deliver bleed-off water to the port[60]. Therefore, small volumes of scrubber discharge waters are collected in Port Reception Facilities i.e. 0.2% of all waste collected (see Table 4.) Most of the scrubber discharge into sea is legal, in line with MARPOL discharge norms. However, the relative volumes involved for this category are large. The volume of acidic water discharges from open-loop scrubbers was estimated at 77% of the total volumes discharged from ships[61]. As large quantities are involved, which might affect the marine environment, the international framework is prone to develop for discharge water from scrubbers under Annex VI and this category is relevant for the revision of the SSP Directive.

As long as discharges of polluting substances into sea under MARPOL Annexes III-V and Annex VI discharge water from scrubbers, are not included in the scope of the Directive, Member States cannot count on systematic information from EMSA-managed tools (e.g. CleanSeaNet) when carrying out their duties of verifying the pollution. Information exchange between Member States is therefore also hindered for the remaining MARPOL Annexes. Member States cannot prosecute in a coordinated way the offenders benefiting from the clarity offered by a common EU liability regime. This is particularly important for discharges into sea because no other EU legislation covers penalties for discharging Annex III-VI substances into sea or gives rules that make the actual act of pollution into sea illegal under EU law.

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[56] Joint Group of Experts on the Scientific Aspects of Marine Environment Protection (GESAMP), 2021. Sea-based sources of marine litter, s.l.: GESAMP.

[57] European Commission (2018). Commission staff working document, Impact Assessment on port reception facilities for the delivery of waste from ships

[58] Emissions to air are reduced by the use of scrubbers, which use liquids to clean the exhaust gases from a ship's engine. The scrubber residue contains sulphur compounds, including sulphuric acids, aromatic hydrocarbons PM, nitrates, nitrites and heavy metals.

[59] While there were 255 vessels fitted with scrubbing systems worldwide in 2015, it is estimated by Statista that their number surpassed 4,000 units in 2020. https://www.statista.com/statistics/1099286/number-of-scrubbers-in-vessels/

[60] Scrubbers can be either open or closed loop or alternate between open and close loop modes (hybrid). Open-loop scrubbers usually take up water from the sea, use it to clean the gases, and discharge the scrubber residue back overboard. The scrubber residue can be treated before discharge, but this is not mandatory, and the water is often discharged without being filtered. Closed-loop scrubbers recirculate the wash water and add chemicals to it, such as caustic soda, to adjust the pH. The system is not waste free: the water is filtered, and sludge is produced. The closed-loop scrubber sludge is stored on board the ship for disposal on-land, at Port Reception Facilities. Additionally, a small amount of the wash water is bleed-off water from the process tank to a water treatment unit. This so-called bleed-off water is a scrubber residue and can be either stored and disposed on-land or discharged overboard after treatment.

[61] European Maritime Safety Agency and European Environment Agency, 2021, European Maritime Transport Environmental Report (EMTER)

Problem Driver 2: Information exchange and/or expertise to effectively detect, verify and penalise pollution from ships are inconsistent across the EU and generally insufficient

Effective detection of illegal discharges, their verification and prosecution (i.e. the enforcement chain) are essential for the Directive and its penalty system to be operative in practice. The evaluation found that Member States face challenges when carrying out their duties of enforcement. The lack of specialised knowledge, experience, financial/human resources along with political prioritisation and the existence of other priorities is a common weakness identified.[62] Moreover, Member State enforcement authorities do not always have the necessary training and specialisation.

Based on information collected during the stakeholders' interviews, the main challenges faced by national authorities in relation to this problem driver are:

- Limited availability of adequate resources, in terms of trained personnel, laboratory capacity and adequate equipment to perform the follow-up activities on-scene;
- Technical challenges related to the verification and evidence collection activities, such as the time and cost required to complete the sampling of the substance associated to the incident, accessibility during night hours/darkness or stormy seas. Furthermore, these challenges are exacerbated when the incident is located in an area far from the coast.

With respect to deficiencies in prosecution, judges sometimes lack specialised knowledge and awareness of the harmful effects leading to dismissed cases or low penalties. In general, stakeholders also view training and specialisation of judges as important for successful enforcement in the field of environmental proceedings.[63]

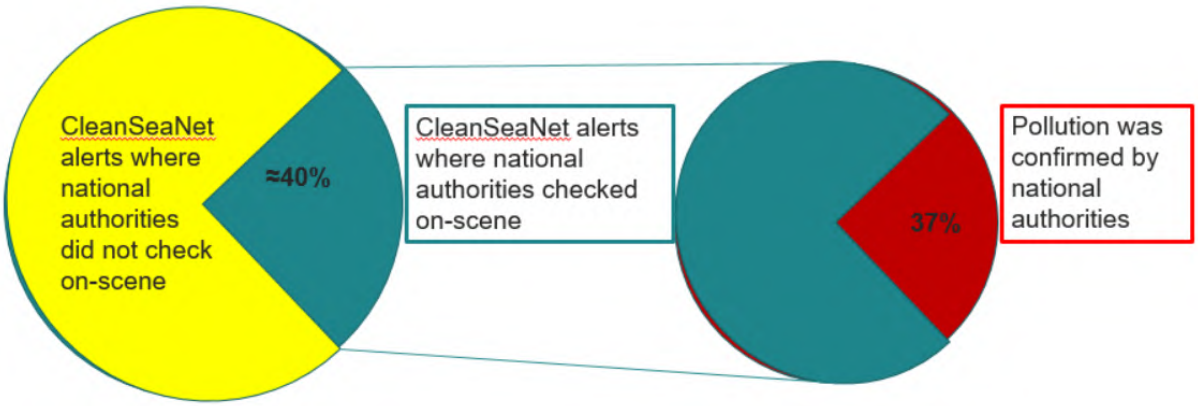
Member States do not always make use of the information supplied by EMSA-managed tools and do not always record their verification results in these tools. Information exchange between Member States is therefore incomplete and not consistent across the Member States. Stakeholders' interviews indicated the need for more EU support in exchanging experience and information about the potential polluters, identifying the pollution incidents and strengthening cooperation between Member States (training, exchanging lessons learned, guidance and real-time information from satellite surveillance or whistle-blowers). Ten national authorities interviewed[64] agreed that resources and/or expertise are insufficient to effectively identify, verify and prosecute ship-source pollution. Two Member State authorities identified the need for better availability of digital technology and equipment to facilitate evidence collection and prosecution for these discharges. Another authority emphasised the importance of introducing innovative technologies and using such information collected as evidence in ship-source pollution cases. Effective verification of pollution incidents requires adequate resources for a continuous level of readiness. Member States must take targeted and timely decisions on whether and how to follow up an alert on a possible spill (notified by national or satellite surveillance or a whistle-blower, or as a result of inspecting a vessel under a different control regime).

Member States deploy their resources to follow-up on-scene and provide feedback to CleanSeaNet alerts to a limited degree. As shown in Figure 5, only 40% of possible oil spills detected by means of the CleanSeaNet are typically checked by the Member State and only 37% of the checked cases result in the confirmation of the pollution. This does not mean that the remaining 63% of the cases

[62] Report on Eurojust's Casework on Environmental Crime, January 2021, p. 13.
[63] European Commission (2021). Commission staff working document, Impact Assessment on the protection of the environment through criminal law.
[64] BG, BE, HR, CY, DE, NL, RO, ES, LV and one anonymous representative of Member State authorities

detected were legal discharges but it means that for the rest of the alerts nothing was observed on the surface of the sea or it was a natural phenomenon e.g. algae bloom.

Figure 5. Follow-up action by Member States for CleanSeaNet alerts on a possible pollution detection in 2021



Source: CleanSeaNet data for 2021. Alert reports for EU Member States, Norway and Iceland.

The analysis of CleanSeaNet data shows the following trends concerning verification:

- All Member States log feedback in CleanSeaNet, however only 6 Member States (out of 23) are responsible for 60% of feedback data logged in CleanSeaNet (based on 2020 data).
- A high verification rate usually does not lead to better results in the confirmation of the pollution. Based on data recorded by Member States on how they follow-up CleanSeaNet alerts, the higher number of follow-up activities per Member State does not lead to more confirmation of the pollution incidents.[65]
- The chances of confirming the pollution depend on how quickly the Member State aircraft or patrol vessel gets to the scene of the incident (the interval between the time of the satellite image acquisition and the Member State verification). The longer this interval, the more likely it is that no pollution is found on the spot. For example, in 2019, 5% of the checks were performed within 3 hours of the satellite observation. This resulted in 42% of confirmations of pollution.[66]

- Data collected by Integrated Maritime Services in SafeSeaNet, CleanSeaNet, THETIS and THETIS EU can facilitate the decision on whether to verify the incident or not. An example is that, through THETIS, Member State authorities have access to past port State control inspection findings for a particular ship and can use this information to take a decision. They can also use THETIS EU to see if the particular ship left the waste in question in the Port Reception Facility of the previous port of call.

Problem Driver 3: Penalties applied by Member States for illegal pollution from ships do not consistently discourage polluters

In order for the national enforcement to be effective, the administrative and criminal enforcement regimes must be seen as interlinked parts of one system and ought to coexist. Drawing on evaluation findings, the effectiveness of the Directive has been limited by the lack of consistency and a common understanding among Member States on when to apply which type of penalty (i.e. what

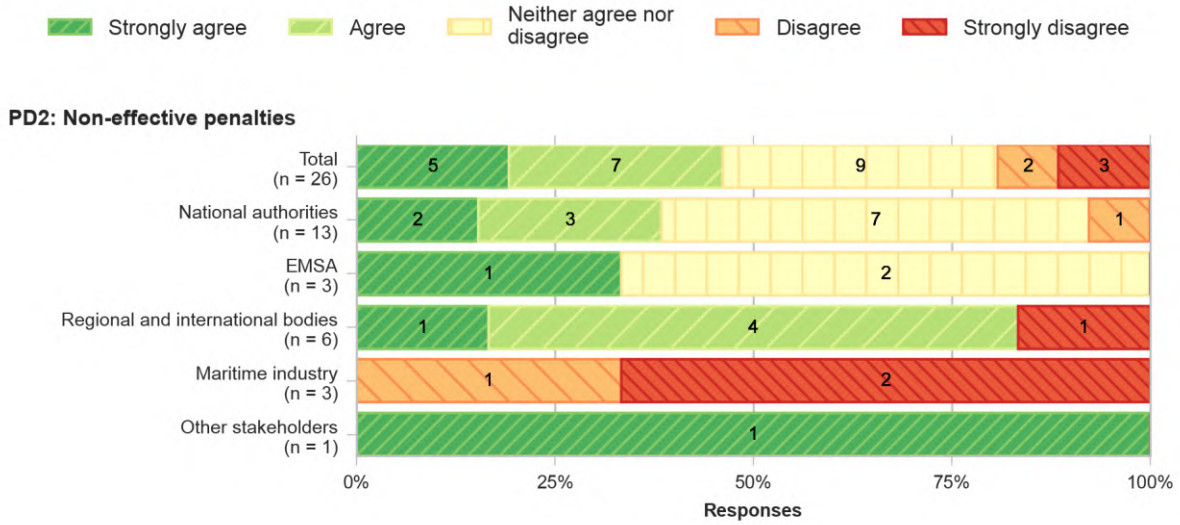
[65] See Figure 19 in Annex 4

[66] European Maritime Safety Agency and European Environment Agency, 2021, European Maritime Transport Environmental Report (EMTER)

constitutes a 'minor' discharge). The information relating to penalties applied by courts in Member States is not available or fragmented. This is because the information is not systematically reported by Member States and is often decentralised (i.e. individual courts within a Member State). Furthermore, Member States rarely report on the number of prosecutions to the Commission (Table 3 in section 2.1) since there is no explicit requirement to provide such figures. The stakeholder feedback to consultations during the impact assessment was also limited. The response rate has been low and information received very limited[67].

Twelve out of 26 stakeholders consulted agreed or strongly agreed with this problem driver[68] (Figure 6), whereas industry generally disagreed (considering that international rules are sufficient for discouraging illegal discharges from ships).

Figure 6. Stakeholder answers in interviews on problem driver 3



Specifically on the levels of penalties, based on the information obtained from stakeholder consultation activities and the data of the Network of Prosecutors in the Baltic Sea (ENPRO) and in the North Sea (NSN), all Member States foresee in their national legislation a minimum and maximum value for penalties as summarised in Table 5. The higher vulnerability of some regions and diverging capacity of Member States to prosecute cases of ship-source pollution makes this problem driver key. The minimum and maximum levels of penalties diverge substantially between Member States, however it must be recalled that the Directive was not meant to harmonise the levels of penalties but aimed to harmonise the principles applicable to penalties i.e. penalties must be proportionate. As such, Member States currently have the flexibility to define the penalties' level, method of calculation and criteria.

Table 5. Minimum and maximum levels of penalties foreseen for infringements for natural and legal persons (prices in EUR)

	Who?	Lowest	Highest
Minimum penalty	Natural person	10 (EE)	150,000 (PT)
	Legal person	32 (EE)	500,000 (DE)
Maximum penalty	Natural person	14,220 (SE)	5,000,000 (IE)

[67] There were only 30 replies to the open public consultation and 3 replies in the form of the response to the evaluation survey. 26 interviews took place although the timeline was extended and multiple rounds of interview requests were sent.

[68] Stakeholders that agreed or strongly agreed that penalties are not effective include five MS authorities (NL, RO, LV, SE), five regional/international organisations and one environmental NGO.

	Who?	Lowest	Highest
	Legal person	10,000 (PT)	247,000,000 (SE) Unlimited cap (DK)

Source: Ricardo (2023), Evaluation support study compiled from stakeholder consultation activities and data of Network of Prosecutors in the Baltic Sea (ENPRO) and in the North Sea (NSN).

HELCOM[69] tried to address the issue of diverging penalties by adopting recommendations on a harmonised system of fines for the Baltic Sea for ship-source pollution[70]. The recommendation criteria for a common minimum level of fines in a case when a ship violates regulations were agreed and minimum amounts for fines were adopted. However, this recommendation has not been applied by HELCOM member States and the flexibility remains also for Baltic Sea countries.

Based on information collected in the evaluation and from Member States during the consultation on this impact assessment, the types and levels of penalties are different amongst Member States. Given that the Directive was not meant to harmonise levels of penalties, the logical link between the non-harmonised levels of penalties across Member States and the problem that offenders rarely face effective, proportional and dissuasive penalties is the proportionality of penalties. If penalties are too small to discourage pollution then the problem driver will continue to persist. Adding to the latter the stakeholders' view that penalties are rarely imposed (see Figure 4), one can infer that the dissuasive effect of penalties in the EU is not fully achieved.

Problem Driver 4 – Incomplete reporting by Member States on pollution incidents and on follow-up activities results in the lack of information on ship-source pollution across the EU.

The reporting streams related to ship-source pollution are described under the subheadings below. There is no systematic reporting on pollution incidents and on follow-up activities neither at European nor at international level under the IMO. The limited reporting by Member States on incidents, their verification and prosecution results in the lack of information on ship-source pollution across the EU. This hindered the evaluative analysis (see Annex 8).

European Commission

Article 12 of the SSP Directive requires Member States authorities to report to the Commission simply on the *application* of the Directive and cannot therefore offer the granularity needed for evaluating the effectiveness of the Directive. The reporting provision does not have any deadlines (requires reporting every three years), no requirements on what type of information is to be reported, no concrete obligations for reporting on enforcement and consequently weak basis to open infringements. This provision is not detailed enough to oblige Member States to report on the number of offenders identified and penalties imposed. For this reason, Member States have not systematically reported to the Commission (only 8 Members States submitted a report in the period 2015-2020 as shown in Table 3., in section 2.1).

Member State can report to EMSA-operated systems. This includes information related to ship-source pollution: 1) CleanSeaNet service feedback forms on the potential pollution identified; 2) pollution incident reports (POLREP) exchanged as part of SafeSeaNet; and 3) inspection requests related to suspected MARPOL infringements submitted via THETIS. There are no obligations in the SSP Directive for Member States to report to EMSA and these tools are only being used to a

[69] HELCOM is an intergovernmental organisation for the environment of the Baltic Sea. HELCOM consists of ten members – the nine Baltic Sea countries Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden, plus the European Union.

[70] HELCOM recommendation 19/14, 1998, A Harmonized System Of Fines In Case A Ship Violates Anti-Pollution Regulations

limited extent by Member State authorities. For example, Member States submit on average only approximately 200 SafeSeaNet pollution incident reports and 120 inspection requests via THETIS annually[71]. Feedback to CleanSeaNet alerts is higher, with Member States submitting on average 1400 feedback forms annually.[72]

International Maritime Organisation

Reporting to IMO on marine incidents, including marine safety investigations, has been low and with significant gaps for European parties of IMO. Similarly as at EU level, there is no representative information on the number of incidents nor penalties imposed. Contracting Parties of MARPOL should submit their reports using the Global Integrated Shipping Information System[73]. According to recent reporting examples, only 7 Member States reported to IMO in 2018, and only 5 Member States in 2019. The report in the format as set in the MARPOL Circular MEPC.1/Circ.318, could be of use for tracking the success of the SSP Directive. Especially relevant are Part 1 of the reporting format (Annual summary report of incidental spillages under Article II of Protocol I and Article 12), which aim to provide IMO with a summary of discharges not permitted under the MARPOL provisions and pollution due to ship casualties, as well as Part 2 (Annual enforcement report on alleged discharge violations), which aims to summarise the violation cases referred by coastal States to other administrations for prosecution or other action. However, only limited information is available under the international reporting stream and the granularity needed to assess the penalties is therefore also missing at international level.

Regional Sea Conventions

Reporting by relevant parties to Regional Sea Conventions is more advanced in some regions e.g. Baltic and North Sea (where reports on aerial surveillance activities are published annually), and less advanced in others e.g. Black Sea. In 2018-2019, 14 Member States reported to HELCOM[74] and the Bonn Agreement[75] on oil spills. The regional reporting commitments are however limited to a regional sea which means a narrow geographical scope.

In conclusion, Member States do not systematically report to the European Commission, IMO or to all Regional Sea Conventions, nor do they systematically record their enforcement activities via EMSA tools. For this reason, transparency on Member States' action is weak and results in large gaps in information on ship-source pollution across the EU. In all Member States, there is a lack of statistical data on verification and prosecution. The lack of data results in limited information on the entire flow of cases over the law enforcement chain, from detection, through verification to prosecution. Against this backdrop, Member States' performance cannot be compared nor evaluated properly. Such lack of data makes it difficult to monitor the effectiveness of the Directive, to identify obstacles in the law enforcement chain and to take targeted and informed decisions[76]. This leads to the lack of information to the public and the co-legislators, the general public's lack of

[71] Compilation of data for period 2012-2021
[72] Compilation of data for period 2012-2020
[73] International Maritime Organisation https://gisis.imo.org/Public/Default.aspx
[74] HELCOM is an intergovernmental organisation for the environment of the Baltic Sea. HELCOM consists of ten members – the nine Baltic Sea countries Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden, plus the European Union.
[75] Bonn Agreement is an intergovernmental environmental agreement for the North Sea. Members of the Bonn Agreement are Belgium, Denmark, the European Community, France, Germany, Ireland, the Netherlands, Norway, Sweden, United Kingdom and Spain.
[76] European Commission (2021). Commission staff working document, Impact Assessment on the protection of the environment through criminal law.

awareness of the scale and impacts of ship-source pollution infringements, the lack of political prioritisation and consequently the lack of the necessary resources for law enforcement authorities.

Other problem drivers considered in the impact assessment and discarded

A problem driver on air pollutants was considered during the impact assessment and discarded at an early stage:

- The Directive's scope does not cover air pollutants released into the atmosphere regulated by MARPOL Annex VI.

Due to the different nature of air pollution compared to pollution into sea, the IMO and the EU have opted for different regulatory frameworks to address air emissions from international shipping, namely, certification schemes, tax schemes, engine design requirements, ship design parameters (further detailed in Annex 5).

2.3. How likely is the problem to persist?

In the absence of EU action and changes to the legal framework, illegal discharges from ships into sea will continue not being addressed by effective and dissuasive penalties. As long as MARPOL Annexes III-VI are not included in the scope of the Directive, Member States will continue to be only bound by their international obligations to ensure enforcement of MARPOL. However, as explained above, there is very little reporting back to IMO on the enforcement of MARPOL provisions by Member States. Therefore, it is likely that Member States will continue to prosecute the offenders in a non-harmonised manner.

At the same time, the use of EMSA tools for information collection and exchange will remain limited for the substances in the scope of MARPOL Annexes III-VI. Nevertheless, future technological innovations may facilitate, to some extent, the work of enforcement authorities. According to the 2022 Strategic Foresight Report[77], "enabling a greener transport sector with digital technologies" is one of the areas where the twinning of the green and digital transitions is expected to have a major effect. Member States exploiting new technologies, such as the use of innovative detection tools to better monitor the environmental performance of ships is one of the key relevant factors identified. Despite the benefits of digitalisation, EMSA tools are expected not to be used at their full potential without further EU action.

The new Environmental Crime Directive will ensure some improvement in the field with a likely impact on the number of SSP prosecutions, thanks to the introduction of a harmonised treatment of criminal sanctions. However, the identified problem will still persist because the provisions of the SSP Directive will not change and therefore will not be specific enough to make the penalties for ship-source pollution more effective and dissuasive. Moreover, the ECD will not cover MARPOL Annexes III-VI pollutants in the absence of EU action.

The stronger rules under the Port Reception Facilities Directive ensure that adequate Port Reception Facilities are ready to accept waste at European ports. However, without further EU intervention for strengthening prevention - the detection of pollution, supporting the identification of the offenders and the dissuasive effect of penalties, the illegal discharges by ships are likely to persist with the resulting effect of less waste delivered to Port Reception Facilities.

[77] COM(2022) 289 final.

3. WHY SHOULD THE EU ACT?

3.1. Legal basis

Title VI (Articles 90-100) of the Treaty on the Functioning of the Union (TFEU) establishes the EU's prerogative to make provisions for the Common Transport Policy and therefore the EU has the right to act under the Treaty on ship-source pollution. Pursuant to Article 100(2) TFEU, the Union legislator may lay down appropriate provisions for sea transport. Article 91(1)(a) of the TFEU provides that the Union has competence in the field of transport to lay down common rules applicable to international transport. In view of this, the revised SSP Directive would be based on Article 100(2) TFEU[78].

3.2. Subsidiarity: Necessity of EU action

Ship-source pollution typically leads to damage with cross-border dimensions as an SSP illegal discharge can impact the coastline of several countries or have cross-border effects. Due to the frequent transboundary impact of marine pollution and the fact that perpetrators act across borders, action by Member States alone would not be suited to tackle this problem. Therefore, it is essential that Member States have the same understanding of which discharges constitute offences and should be addressed by dissuasive penalties. Diverging national approaches in this regard hinder efficient cooperation of Member States and allow offenders to escape penalties. Cross-border cooperation between law enforcement and judicial authorities is necessary. The EU action of facilitating cooperation and information exchange is an effective approach towards ship-source pollution confirmed by the findings of the evaluation (see Annex 8). However, the findings also show that despite the progress made on a common framework for SSP offences and despite the support for cooperation and information exchange, the EU and its Member States have not been able to achieve the objective of the Directive and the problem identified is still relevant.

Certain geographic areas and countries have been identified as being more vulnerable to the impacts of ship-source pollution, owing to their proximity to shipping routes[79]. The East Atlantic and Black Sea regions are likely to be more sensitive to oily waste than the Mediterranean and the Baltic Sea, whereas the Mediterranean region is the most vulnerable in relation to sewage from ships. Garbage poses a risk to the marine environment with no regional differences among them[80]. Furthermore, the evaluation shows that the verification capacity of the Member States of the North Sea and Baltic Sea are higher than those for the Mediterranean or Black Sea areas. The higher vulnerability of some regions and diverging capacity of Member States to verify and prosecute cases of ship-source pollution makes EU action necessary, especially with accompanying measures of support by common EMSA digital tools.

In brief, given the international nature of maritime transport, there is a "Union relevance" of revising the Directive, to expand the scope of the Directive and further address the identified problem. There is a clear need to have a cross-border framework that would ensure equal treatment for ship operators regardless of where the pollution incident occurred.

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[78] Article 100(2) TFEU is ex Article 80(2) TEC, which was the legal basis for Directive 2005/35/EC on ship-source pollution

[79] Science article by Yanzhu Dong (2022), Chronic oiling in global oceans, Vol 376, Issue 6599, pp. 1300-1304

[80] European Commission (2018). Commission staff working document, Impact Assessment on port reception facilities for the delivery of waste from ships .

3.3. Subsidiarity: Added value of EU action

Action at Union level would be more effective than action at national level because it can offer a strong deterrent effect on perpetrators that act across borders. Shipping is an international sector, operating in different EU and international waters and regulated at the global as well as regional and national instances.

Member States would be able to address the problem and incorporate the international standards for ships on their own because all Member States ratified the MARPOL Convention. However, they would not be as effective and efficient. The current Directive already complements the MARPOL standards by supporting the Member States in identifying the offenders through information from EMSA digital tools e.g. satellite surveillance. The added value of a revised Directive would be further clarification of the exceptions form liability, as part of the EU liability regime, and improved satellite surveillance covering more types of pollutants thanks to the extended scope of the Directive in line with MARPOL. The revision also aims to introduce new measures beyond MARPOL on types and levels of penalties imposed[81] as well as integrated digital solutions for data collection and exchange. The later cannot be achieved without an aligned legal framework and common digital tools. Action at Union level would therefore bring added value as compared to action at national level.

For example, satellite surveillance capabilities offered by the CleanSeaNet service constitute significant value due to economies of scale. CleanSeaNet is generally perceived by stakeholders as a significant added value of the Directive[82]. The evaluation showed that the detection of potential discharges from ships is up to 7 times less costly when done at EU level.

In brief, a revised Directive could ensure a level playing field and facilitate national verification, and prosecution as well as cross-border enforcement leading to more dissuasive penalties. EU action will provide for clear added value on countering ship-source pollution which typically has a transnational dimension compared to what Member States acting alone can achieve.

4. OBJECTIVES: WHAT IS TO BE ACHIEVED?

4.1. General objectives

One of the aims of the European Union within its borders is to protect and improve the quality of the environment. The revised SSP Directive is to contribute to the overall goals set out in the Sustainable and Smart Mobility Strategy and the European Green Deal. In view of the problem identified in section 2.1, the review of the SSP Directive should ensure that persons responsible for discharges of polluting substances into the sea are subject to adequate penalties, in order to improve maritime safety and to enhance the protection of the marine environment from pollution by ships. This means preventing pollution from ships by aligning with MARPOL standards and consequently improving maritime safety. Therefore, the general objective is:

"In line with the European Green Deal, the aim is to incorporate into EU law international standards for ship-source pollution into sea and to ensure that persons responsible for

[81] Without prejudice to the revised Environmental Crime Directive.

[82] 10 out of 14 Member State authorities interviewed agreed that CleanSeaNet service has increased the efficiency of the process. Out of the 28 respondents who in the public consultation answered the question on efficiency, 13 (47%) viewed CleanSeaNet as an efficient tool (the other half responded 'I don't know' including all industry representatives).

discharges of polluting substances into sea are subject to effective, proportionate and dissuasive penalties, in order to improve maritime safety and to enhance protection of the marine environment from pollution by ships".

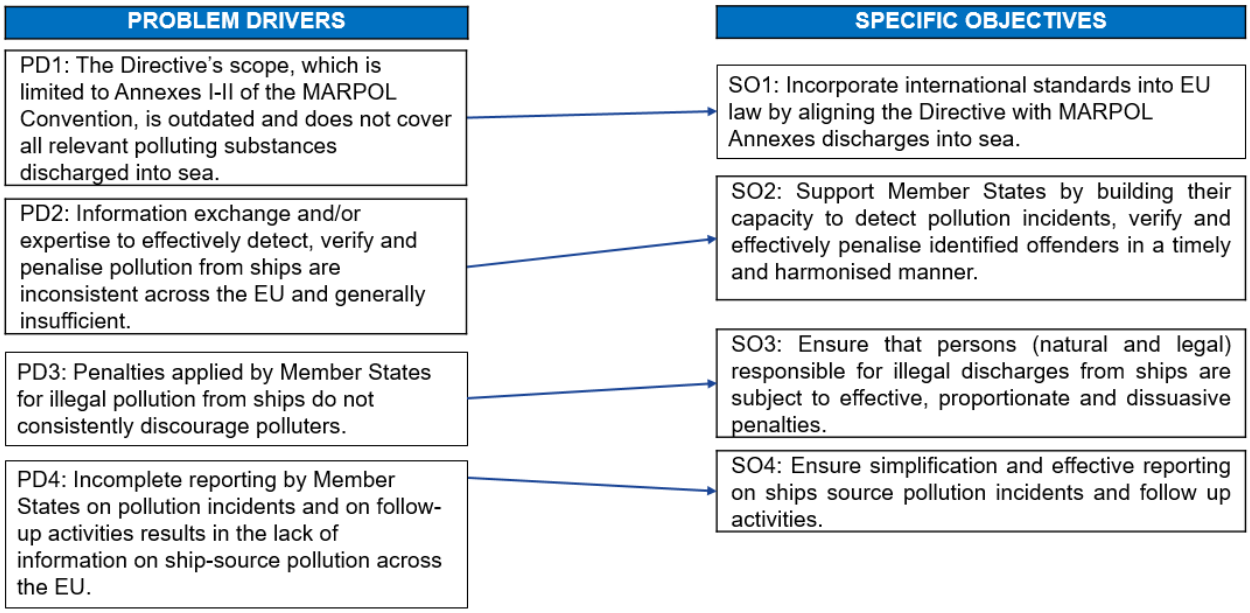
The success of the revised Directive can be measured by the increased proportion of illegal discharges for which more effective, dissuasive and proportionate penalties are imposed. This should ultimately contribute to the reduction of illegal discharges because effective law enforcement increases the likelihood of detection and penalisation and reduces the chance that the offending ship gets away. Less illegal discharges in return will help to preserve the marine environment.

The revision should contribute towards Sustainable Development Goal (SDG) 14 ("*Conserve and sustainably use the oceans, seas and marine resources for sustainable development*") and SDG 3 ("*Ensure healthy lives and promote well-being for all at all ages*"), and with its provisions on prosecution to SDG 16 ("*Peace justice and strong institutions*").

4.2. Specific objectives

This initiative is primarily designed to complement the Port Reception Facilities Directive and to effectively address pollution coming from waste generated by ships as well as to address the identified problem. The specific objectives (SOs) and their correspondence with the problem drivers are presented in the Figure 7. They can be achieved through the implementation of the Directive that fosters effective detection, verification and prosecution of illegal discharges at sea. Progress towards these objectives would be measured through appropriate indicators. However, the values of these indicators in the baseline are not provided due to serious data limitations, as also shown by the ex-post evaluation.

Figure 7. Correspondence between the specific objectives and the problem drivers



SO1: Incorporate international standards into EU law by aligning the Directive with MARPOL Annexes on discharges into sea. Member States should be able to implement the international rules established by all MARPOL Annexes on discharges into sea in a harmonised manner given the cross-border nature of sea pollution and the international nature of the shipping industry. With the raising concerns on marine environment protection, the objective is to extend the scope for the Directive (together with its satellite surveillance support) to more types of substances. The

interviewed stakeholders were generally in favour of SO1.[83] Progress towards this objective could be measured through the expected increase in the detection capacity and detection levels for oil, noxious substances, packaged goods, sewage, garbage and scrubber discharge water, and, subsequently through the expected decrease in the overall number of illegal discharges due to the deterrent effect of the increased detection capacity.

SO2: Support Member States by building their capacity to detect pollution incidents, verify, collect evidence and effectively penalise identified offenders in a timely and harmonised manner. While enforcement falls under the responsibility and budgets of the Member States (also as parties to MARPOL), EU-wide information exchange tools, training and guidance can offer to the Member States cost-efficient and cross-border support for detecting pollution incidents and the collection of evidence. The integrated and enhanced information delivered to national authorities by EMSA tools will support their decision on whether to verify the incident and will make verification more targeted. The interviewed stakeholder were generally in favour of SO2.[84] This objective aims to help Member States in prioritising and streamlining their action so that they make the best use of their resources for verification (e.g. personnel, aircraft, patrol vessels) and prosecution. Progress towards this objective could be measured through the expected increase in the level of verification. In addition, the proportion of identified offenders as a result of verification could mark progress.

SO3: Ensure that persons (natural & legal) responsible for illegal discharges from ships are subject to effective, proportionate & dissuasive penalties. This objective will ensure that similar pollution incidents will be subject to similar treatment. If penalties are proportionate and effective for all illegal discharges in all European seas, they are expected to become more dissuasive. SO3 is coherent with the Environmental Crime Directive, to the extent that once a Member State, as a result of the verification carried out under the SSP Directive, determines that criminal penalties are required, the ECD would apply. However, if they decide that administrative penalties are more appropriate, the provisions of the SSP Directive would apply. The interviewed stakeholder were generally in favour of SO3.[85] Progress towards this specific objective could be measured by checking if the level and type of penalties is effective, proportionate and dissuasive. The data on the level of penalties in each Member State would allow checking if penalties are proportionate i.e. the level of penalties increases in those Member States where they are very low and hence there is more converge across Member States on the levels of penalties imposed. In addition, the data on the type of penalties in each Member State would allow checking if penalties are effective. Combined, this data would allow assessing if penalties are dissuasive.

SO4: Ensure simplification and effective reporting on ship-source pollution incidents and follow-up activities. Information on the implementation of the Directive (e.g. number of illegal discharges verified and prosecuted as well as penalties imposed) will ensure transparency, evidence-based decision making and is expected to support enforcement by Member States. The evaluation has shown that data on the numbers of cases and penalties needed as indicators to evaluate and monitor

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[83] 11 MS authorities (BE, HR, CY, DK, FI, DE, RO, ES, SE, LV and 1 anonymous representative of Member State authorities), five regional/international bodies, two maritime industry stakeholders and one environmental NGO. However two industry organisations disagreed which reflects the position of industry questioning the added value of the Directive as compared to ratification of MARPOL by all MS.

[84] 11 MS authorities (BE, HR, CY, FI, DE, NL, RO, ES, LV, SE and 1 anonymous representative of Member State authorities), five regional/international bodies, two maritime industry stakeholders and one environmental NGO.

[85] 13 MS authorities (BG, BE, HR, CY, FI, FR, DE, NL, RO, ES, LV, SE and 1 anonymous representative of Member State authorities), five regional/international bodies, two maritime industry stakeholders and one environmental NGO. However two industry organisations disagreed, which reflects the position of industry questioning the added value of the Directive as compared to ratification of MARPOL by all MS.

the success of the Directive either does not currently exist or is fragmented. Improving data collection would therefore be an important specific objective of the future Directive. The simplification and effective digital reporting will contribute to the general objective by accurate data collection according to uniform standards. Additionally, access to information for decision-makers and the public is expected to have a deterrent effect, due to the risk of corporate reputation damage. The interviewed stakeholder were generally in favour of SO4.[86] Progress towards this specific objective could be measured by the improved reporting on the Directive implementation. Success would mean that Member States systematically report the pollution incidents they verified and penalised so that the policy-makers and the public are aware of the progress made.

5. WHAT ARE THE AVAILABLE POLICY OPTIONS?

5.1. What is the baseline from which options are assessed?

The EU Reference scenario 2020 (REF2020) is the starting point for the impact assessment of this initiative. The REF2020 takes into account the impacts of the COVID-19 pandemic that had a significant effect on the transport sector. More detailed information about the preparation process, assumptions and results are included in the Reference scenario publication[87]. Building on REF2020, the baseline has been designed to include the initiatives of the 'Fit for 55' package proposed by the Commission in July 2021. A common baseline was developed for this impact assessment, as well as other impacts assessments in the area of maritime safety (Port State Control, Flag State and Maritime Accident Investigation directives impact assessments), to ensure consistency. More details on the baseline scenario are provided in Annex 4.

The baseline scenario assumes no further EU level intervention beyond the legal framework set by the current SSP Directive (MARPOL Annex I-II discharges etc.), but takes into consideration relevant initiatives at EU or international level, notably the effects of the recent entry into force of the revised Port Reception Facilities Directive and the revised Environmental Crime Directive (ECD). The new Environmental Crime Directive makes parts of the current SSP Directive obsolete because the provisions on criminal proceeding were taken over by the ECD.

The COVID-19 pandemic had a major impact on global shipping, affecting all market segments. In the baseline scenario, international maritime freight transport activity (intra and extra-EU) is projected to be 21% lower in 2020 relative to 2015. From 2021 onwards, however it is projected to start recovering and grow strongly by 2025 and beyond (i.e. 19% growth for 2015-2030 and 48% for 2015-2050), due to the rising demand for primary resources and container shipping. Relative to 2019, this is equivalent to an 8% increase in transport activity by 2030 and 33% growth by 2050. The number of port calls for 2025-2050 is projected to grow at lower rate than transport activity, following similar evolution as over the historical period.

There is high uncertainty regarding the impacts of the recent geo-political events related to the Russian aggression on Ukraine for the long-term. However, these events are not expected to have a significant impact on the baseline relevant for this impact assessment. While the local impact in certain areas (northern Black Sea, Azov Sea) has been significant and trade flows to/from both Russia and Ukraine have been impacted either through sanctions or military action, the overall impact on maritime traffic in the Union is expected to be relatively limited, despite the uncertainty.

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[86] 13 MS authorities (BG, BE, HR, CY, DK, FI, FR, NL, RO, ES, LV, SE and 1 anonymous representative of Member State authorities), five regional/international bodies, one maritime industry stakeholder and one environmental NGO.

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

The baseline incorporates foresight megatrends[88] and developments captured in the 2022 Strategic Foresight Report[89]. Among others, it captures the trend of increasing demand for transport as population and living standards grow. Furthermore, the cruise fleet will more than triple globally in 2050.[90] The increasing demand for transport and cruise tourism will lead to a higher number of ships addressed by the SSP Directive. The 2022 Strategic Foresight Report also reconfirms the existing megatrends identified in the 2021 Strategic Foresight Report[91] and more specifically, the megatrends of "Climate change and environmental degradation" and that of "Accelerating technological change and hyperconnectivity" that relate to the ongoing twin green and digital transitions. The ability of the EU to achieve these twin transitions very closely relates to the deployment of existing and new technologies in scale and their appropriate framing with relevant policies to achieve their maximum effectiveness. "Enabling a greener transport sector with digital technologies" is one of the areas where the twinning of the green and digital transitions is expected to have a major effect. Relevant to the SSP Directive revision, exploiting new technologies, such as the use of satellite surveillance tools to better monitor illegal discharges of ships is one of the key issues identified. The ongoing technological developments would positively influence the baseline because the technological drive would make more digital solutions available on the market for detection and verification. It is however uncertain if Member States would prioritise and allocate resources to new tools for MARPOL Annex III-VI discharges into sea. In addition, without further EU level action EMSA tools are expected not to be used at their full potential and would continue to cover only the MARPOL Annex I-II discharges. Improvements in the surveillance capabilities supported by CleanSeaNet for MARPOL Annex I-II discharges are however expected in the future in the baseline scenario.

National verification assets (aircraft, patrol boat deployment) are outside the scope as Member States have verification obligations directly steaming from their ratification of MARPOL. The amount of aerial resources committed by Member States to maritime environmental surveillance is expected to keep declining as observed over the past 15 years, but this is likely to be offset by improvements in the effectiveness of using these resources, resulting in a stable increase of effective surveillance in the future. The baseline considers the improvements in the effectiveness of using resources due to technological developments, drawing on the foresight megatrends described above.

The share of illegal discharges being detected is affected by the availability of surveillance tools and specialised resources, and improvements in their efficiency. New technological developments on surveillance tools at national and EMSA level (only covering MARPOL Annex I-II discharges in the baseline) are envisaged. National aerial surveillance activity in some Member States will systematically improve e.g. new remote sensing equipment will be purchased for aircrafts due to market developments and product availability. However, this will only be the case for some Member States and will not result in a significant deterrent effect across the EU. EMSA tools covering MARPOL Annex I-II discharges will also further develop and it is likely that in the coming years the Dynamic Overview of National Authorities (DONA) and the Integrated Maritime Services would be adapted gradually to meet the objectives of the SSP Directive. It is therefore likely that there would be some limited new opportunities for data collection and exchange on ship-source pollution in the future but this will not result in significant changes in detection levels. A small increase in the number of offences identified would also result in an indirect limited increase in prosecutions, thanks to the introduction of harmonised treatment of criminal sanctions for serious

[88] https://knowledge4policy.ec.europa.eu/foresight/tool/megatrends-hub_en#explore
[89] COM(2022) 289 final.
[90] DNV Group Research and Development (2022) Ocean's Future to 2050, a sectorial and regional forecast of the Blue Economy
[91] 2021 Strategic Foresight Report | European Commission (europa.eu)

environmental offences due to the proposed revision of the Environmental Crime Directive. This could lead to improved clarity and facilitate the prosecution of cases. The stronger prosecution framework, triggered by the revision of the ECD is likely to improve the efficiency of prosecutions. Illegal discharges from ships are expected to also be affected by market developments. The increasing environmental awareness and reputation concerns[92] is expected to drive the uptake of more sustainable practices by ship operators/owners.

A distinction needs to be made between substances that are currently in the scope of the SSP Directive and those that are not in the scope. For the MARPOL Annexes that are currently in the scope of the SSP Directive (oil and noxious liquid substances in bulk) the baseline scenario foresees a relative stabilisation over time, despite the increase in maritime traffic. This is mostly due to the maritime environmental surveillance supported by the CleanSeaNet and the small increase in the number of infringements identified, and to more limited extend due to the increasing environmental awareness of the shipping sector. The shipping industry acknowledged the improved surveillance capabilities brought by satellite surveillance services and the potential for future technological improvements. Seven of the 12 Member State authorities interviewed[93] agreed that technological developments are expected to have a moderate to a significant positive impact on the level of discharges of polluting substances that are in the scope of the SSP Directive. Thus, the baseline takes into account the ongoing twin green and digital transition.

More specifically, in the absence of further EU level intervention and despite the growth in maritime traffic, the baseline scenario projects a relative stabilisation in the total quantity of illegal oil discharges (MARPOL Annex I) by 2050. Changes in the fuel mix and a global cap on sulphur contents in Heavy Fuel Oil are likely to lead to less oily sludge production with an increased use of Liquefied Natural Gas and Marine Gas Oil as opposed to Heavy Fuel Oil and the environmental risk posed by maritime oil spills can be expected to decline further.[94]

Noxious liquid substances in bulk (MARPOL Annex II) are less frequent than oil spills[95] and, due to their infrequent nature, there is little quantitative data available. It is however expected that these noxious substance spills will remain limited in the future.

For harmful substances carried by sea in packaged form (MARPOL Annex III), are not in the scope of the SSP Directive in the baseline and no data is available for illegal discharges. However, discharges are likely to happen almost exclusively due to accidents, as commercial packaged goods are not intentionally released.

Garbage and sewage (MARPOL Annex IV-V) are not in the scope of the SSP Directive in the baseline and they are thus not currently supported by the CleanSeaNet; albeit already detected in some CleanSeaNet images used for oil spill monitoring (and subsequently verified by Member States). Despite technological developments, which may reduce the costs of satellite monitoring services over time, very few Member States are expected to pursue such additional satellite monitoring services on their own. As shown by the evaluation report, the costs for Member States

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92 Representatives of the shipping industry (European Community Shipowners' Association, Protection and Indemnity Club, International Chamber of Shipping and Baltic and International Maritime Council) consulted in the context of the evaluation and impact assessment support studies reflected this point as a factor for improving the performance of ship operations.

93 HR, CY, MT, NL, ES and 2 anonymous representative of Member State authorities

94 DNV Group Research and Development (2022) Ocean's Future to 2050, a sectorial and regional forecast of the Blue Economy

95 European Maritime Safety Agency and European Environment Agency, 2021, European Maritime Transport Environmental Report (EMTER)

for procuring satellite images are estimated to be up to 7 times higher than the costs for EMSA. Thus, the technological developments are not expected to have a significant impact on garbage and sewage discharges, which are projected to grow in line with the maritime traffic in the baseline. Increasing environmental awareness is also expected to have limited impact. More specifically, pollution from sewage from ships (MARPOL Annex IV) is likely to increase in line with the maritime traffic, notably for RO-PAX ships[96] and cruise fleet. The transport activity for these categories of ships is projected to increase steadily as tourist levels return to pre-pandemic levels (i.e. 25% increase for 2015-2030 and 56% for 2015-2050). Garbage from ships (MARPOL Annex V) contribute to the marine litter problem with an estimated EU average of 32% and values up to 50% for some European sea basins. It is likely that discharges will increase over time due to the trend in maritime traffic, even if an increasing share of the garbage is delivered in ports and behavioural changes reduce garbage generation, notably for cruise fleet (e.g. reduction of single use plastics).

For air pollution from ships (MARPOL Annex VI), legislation in place is expected to lead to a clear decoupling from shipping volumes and a reduction of the SO_x emissions released to the atmosphere by 32% by 2030 and 56% by 2050 compared with 2015. Air emissions released to the atmosphere can be reduced to compliant levels through the installation of emission abating scrubbers or the use of fuel-compliant options. The majority of scrubbers are systems operating in open loop, and their discharge waters are released into the sea, while closed loop systems generate sludge and bleed-off water delivered to Port Reception Facilities. Increases in the release of scrubber discharge waters into sea are to be expected in the future, following new restrictions on high sulphur fuels in non-Sulphur Emission Control Areas[97]. For more details on scrubber discharge waters see Problem Driver 1 in section 2.2.

In the baseline scenario, the most significant costs generated by the Directive are related to the CleanSeaNet that are based on a state-of-art system for satellite surveillance. The costs for CleanSeaNet are estimated at EUR 5.17 million in 2020 and are projected to remain stable over time (in 2020 prices) in the baseline scenario.

Member States administrations are estimated to need 80 hours per year for reporting on the application of the SSP Directive to the European Commission[98] in the baseline scenario. The total reporting costs per Member State are estimated at EUR 3,144 and at the EU level at EUR 70,048.[99] In addition, the costs for verifying the CleanSeaNet pollution alerts are estimated at EUR 105,470 for 2020 and are projected to remain stable over time. Finally, the costs for submitting pollution incident reports (POLREPs) in SafeSeaNet and inspection requests issued through THETIS[100] are estimated at EUR 13,000 per year from 2020 onwards in the baseline scenario. Thus, at EU level, total costs for Member States administrations are projected at EUR 188,518 per year by 2050 (in 2020 prices) in the baseline scenario.

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[96] RO-PAX acronym refers to passenger roll-on/roll-off ships.

[97] European Commission (2018). Commission staff working document, Impact Assessment on port reception facilities for the delivery of waste from ships

[98] The reporting on the application of the SSP Directive to the Commission takes place every three years. For the purpose of the analysis, these costs are transformed into annual costs. This is because the main effort is related to the collection, preparation and adjustment to fulfil the reporting requirements.

[99] Assuming an average hourly labour cost of 39.8 EUR for professional, technical and scientific services at EU level (in 2020 prices) Source: Eurostat [LC_LCI_LEV]

[100] Member State authorities submit an inspection request related to a suspected illegal discharge (MARPOL infringement) via THETIS, the EMSA inspection database.

5.2. Description of the policy measures and policy options

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

Retained policy measures and policy options overview

The retained regulatory and non-regulatory policy measures have been grouped in three policy options (PO A, PO B and PO C) as presented below. The tables below present the links of the retained policy measures with the specific policy objectives, problem drivers as well as policy options. The policy measures that are common to all policy options (such as PMc1 on the extension of the scope of the Directive) are presented in Table 6. Next, Table 7 presents the measures that are different between policy options, to allow focusing the impact assessment on the differences between the policy options. A detailed description of the policy measures is provided in Annex 6.

Table 6. Policy measures common for all three policy options.

Policy Driver (PD) & Specific Objective (SO)	**Policy Measure (PM)**	**Policy Option (PO)**		
		PO A	**PO B**	**PO C**
PD1 SO1	**PMc1 – Extend the scope of the Directive** to polluting substances under MARPOL Annex III-V and to discharge water from scrubbers under MARPOL Annex VI and include a review clause to encompass future developments of the MARPOL Convention.	√	√	√
PD2 SO2	**PMc2** - EMSA provides **training** and **guidance** to authorities responsible for detection, verification and evidence collection.	√	√	√
	PMc3 - The Commission establishes a dedicated **expert group** facilitating cooperation between Member States, including through the adoption of guidelines.	√	√	√
	PMc4 – Inclusion of a provision on **whistle-blowers**, their protection and means of passing the relevant **information**.	√	√	√
	PMc5 – EMSA further enhances the data exchange tools and automated links in the **Integrated Maritime Services** based on CleanSeaNet, THETIS, THETIS EU and SafeSeaNet.	√	√	√
PD3 SO3	**PMc6 –** The exception from **liability** for polluters, including crew members, will be further **clarified** in the Directive.	√	√	√
PD4 SO4	**PMc7** - Obligation for Member States to **log** their feedback data in CleanSeaNet and document **if and how CleanSeaNet alerts have been verified**.	√	√	√

The common measure for all policy options to address the first specific objective (SO1) refers to the extension of the scope of the Directive by covering illegal discharges of MARPOL Annex III-V substances and discharge water from scrubbers of MARPOL Annex VI (PMc1). Four common measures would contribute to achieving SO2, namely the provision of more training and guidance to the Member States (PMc2), the establishment of an expert group (PMc3), the information from whistle-blowers (PMc4) and the enhancement of Integrated Maritime Services (PMc5).

Furthermore, to address SO3, all policy options provide further clarifications on the liability regime (PMc6). Finally, and importantly, to make best use of the information from CleanSeaNet and to address SO4, each Member State will be obliged to log if and how CleanSeaNet alerts have been verified (PMc7).

In particular:

- PMc2 (training and guidance) is linked to problem driver 2 and specific objective 2. With the national authorities acquiring more training on ship-source pollution and sharing their experience with others, it is expected that enforcement is enhanced leading to a dissuasive effect. Stakeholders were generally in favour of this policy measure.[101]

- PMc5 (enhancement of Integrated Maritime Services) is linked to problem driver 2 and specific objective 2 and promotes exchanges of information between different EMSA systems (CleanSeaNet, THETIS, THETIS EU and SafeSeaNet). Stakeholders were also in favour of this policy measure.[102] They emphasised the value of EMSA tools and the potential advantages of further integration.

- PMc6 (liability regime clarifications) is linked to problem driver 3 and specific objective 3 and provides clarification of the existing legal framework. It clarifies a key legal element of the EU liability regime for the rare cases when damage to the ship or its equipment happens. This measure spells out a legal exception of MARPOL. Stakeholders did not have a good understanding of the complex legal issue and, therefore, no set opinion, however there was no opposition.[103]

- PMc7 (obligation to log if and how CleanSeaNet alerts have been verified) aims at monitoring how the surveillance mechanism of CleanSeaNet is used by Member States in practice. PMc7 is feasible under a directive because it provides a general obligation which Member States can transpose into their national legislation and decide on the details of application. There was rather low support of stakeholders for this measure due to additional work required, and some stakeholders expressed opposition.[104]

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[101] Sixteen out of 17 stakeholders who provided a response to a question on this measure in the survey (including 11 Member State authorities, EMSA and four regional/international bodies) identified guidance and training as a relevant and suitable policy measure.

[102] In the stakeholder workshop 23 out of 41 participants that voted were of the opinion that this measure would make the biggest difference in increasing cooperation between Member States and information exchange. In addition seven out of the 17 stakeholders (including six Member State authorities and one regional body) that responded to this question in the interviews supported this measure.

[103] Generally, there was a lack of sufficient knowledge on the EU liability regime. Only six out of the 21 stakeholders consulted, three regional bodies) provided their views on this measure in the interviews. Two of them (two MS authorities, BG and CY) agreed with this measure, as they considered that the proposed additional text clarifies the principles stated by international conventions. Two industry representatives (ECSA/ICS) stated that the adoption of this measure would be only a partial improvement.

[104] Five out of the 12 stakeholders (including four MS authorities and one regional body) who provided a response in the interview identify challenges associated with the implementation of this measure. One MS authority (BG) disagreed with this measure, as they considered that it could be difficult to implement from an operational perspective. Two MS authorities (MT, ES) also highlighted the challenges and additional administrative burden that this policy measure could impose on national authorities if implemented. Furthermore, another MS authority (RO) indicated that there will probably issues implementing this measure, although they are not expected to be significant.

All policy options achieve improved alignment with the MARPOL Convention. The ambition level for all options is similar; providing the Member States with accurate and timely information and keeping the digital tools in line with the increased pace of digital transition.

Table 7. Policy measures that are different between policy options.

Policy driver and specific objective	Policy measure	PO A	PO B	PO C
	PM1 – Inclusion of a provision on minimum requirements for verification by means of a national target of **60% verification rate for CleanSeaNet alerts**.			√
PD3 SO3	**PM2a** – Each Member State defines in their **national** legal order the **components of infringements**, either on the basis of '*minor cases'* and '*deterioration of the quality of water'*, or on any other basis prescribed by the Directive, and applies administrative or criminal penalties accordingly.	√		
	PM2b – The **Directive** provides definitions of the **components of infringements**, either on the basis of '*minor cases'* and '*deterioration of the quality of water'* or on any other basis prescribed by the Directive.		√	√
	PM3a – The Directive provides principles for setting the **level of administrative penalties**. The Commission will develop an implementing act on the **criteria** to be applied (e.g. depending on type of polluting substances).		√	
	PM3b – The Directive provides principles for setting the **level of administrative penalties**, the **criteria** to be applied (e.g. depending on type of polluting substances) as well as **values** for the maximum and minimum levels for administrative penalties.			√
PD4 SO4	**PM4** – Obligation for Member States to **report** their data in an EMSA-managed tool on each ship-source pollution incident.		√	√
	PM5a – Member States inform the public about ship-source pollution incidents through a **national website**. Member States may also report this data to the Commission.	√		
	PM5b – EMSA publishes **online key EU information** reported by Member States about ship-source pollution incidents.		√	√

Overall, the policy options present alternative ways of meeting the specific objectives to differing degrees. All options propose solutions to the identified problem, but vary in terms of approach, level of harmonisation and amount of discretion left to the Member States.

Policy option A - Emphasis on the implementation at a national level

PO A leaves most discretion to Member States on implementing MARPOL standards, whilst keeping the level of EMSA support sufficiently high (training, guidance, enhanced EMSA tools). PO A makes the Member States responsible for keeping the public informed about pollution incidents, through national websites[105]. PO A also leaves more flexibility as compared to the other options in terms of types and levels of penalties. This option follows a national approach towards

[105] Stakeholders, especially Member States, were generally not supportive on holding their own websites as they consider it not efficient. Five out of the 12 MS authorities consulted expressed their disagreement with this measure. One MS authority indicated that they do not see the need for a website to be developed at national level, as they believe it would be enough to provide the information through the reporting portal DONA.

determining the type of penalty and does not regulate the level of penalty. In PO A, there is thus more flexibility left to Member States with a minimum of EU intervention.

In policy option A, specific objective 1 is addressed by means of the common measure PMc1 (extension of the scope of the Directive) and specific objective 2 is addressed by four common measures: PMc2 (training and guidance), PMc3 (expert group), PMc4 (information from whistle-blowers) and PMc5 (enhancement of Integrated Maritime Services). Specific objective 3 is addressed by PMc6 (clarifications on liability regime) and PM2a (type of penalty), while specific objective 4 by PMc7 (obligation to log if and how CleanSeaNet alerts have been verified) and PM5a (information to the public on national websites). This policy option assumes that the MARPOL international standards, ratified by individual Member States are in principle sufficient to tackle the identified problem for the extended scope. The additional elements in this policy option beyond the baseline scenario are limited to the common measures (e.g. enhanced EMSA tools) and a basic national reporting measure.

Policy option B – Strengthened cooperation between EU Member States

PO B focuses on Member States working together on common setting for penalties. PO B provides that the levels of penalties will be agreed in an implementing act which will be prepared with the cooperation and support of the newly established Expert Group. Member States will also use a common reporting tool which can further enhance cooperation by information exchange within the existing Integrated Maritime Services. PO B is expected to provide a better structure for cross-border cooperation to strengthen Member State enforcement without introducing major regulatory measures and costs for Member States.

In policy option B, specific objective 1 is also addressed by means of the common measure PMc1 (extension of the scope of the Directive) and specific objective 2 is addressed by the four common measures as above. In order to ensure that offenders are appropriately penalised (SO3), this policy option aims at cooperating and agreeing on common criteria on levels of penalties (PM3a). It also provides clear principles for the components of infringements (PM2b). With regard to reporting obligations (SO4), EMSA would develop a new reporting tool to simplify data reporting and information sharing (PM4) and will keep the public informed about ship-source pollution incidents through an online portal (PM5b). This option would strengthen the capacity of Member States to interact with each other, while minimising the burden on Member State administrations. In this policy option, flexibility for Member State administrations is balanced with increased cooperation in key areas of penalties, reporting and information to the public.

Information published at EU level (PM5b – information to the public on EU website) reinforces national enforcement efforts by offering transparency to promote Member State accountability towards citizens. PM5b offers to the public the direct result of more effective reporting, linked to the specific objective 4 and problem driver 4.[106]

Policy option C - Emphasis on EU harmonisation

PO C focuses on stronger EU harmonisation and cooperation between Member States. It obliges Member States to verify at least 60% of their CleanSeaNet alerts. PO C is expected to generate higher verification costs but, as PO B, it is expected to provide a structure for cooperation between

[106] There is public demand for such environmental information and the measure is supported by stakeholders. Five out of the 12 MS authorities consulted agreed with the measure related to the European Commission providing public information based on the information reported by Member States on the enforcement of the SSP Directive.

Member States and strengthened enforcement. On the levels of penalties, PO C further strengthens harmonisation across the EU as compared to PO B.

For policy option C, specific objective 1 is addressed by means of the common measure PMc1 (extension of the scope of the Directive). Specific objective 2 is addressed by the four common measures as above, as well as by PM1 (60% verification rate for CleanSeaNet alerts). Specific objective 3 is addressed by PMc6 (clarifications on the liability regime), PM2b (type of penalty) and PM3b (level of penalties), while specific objective 4 by PMc7 (obligation to log if and how CleanSeaNet alerts were verified), PM4 (reporting) and PM5b (information to the public on EU website).

PM1 (60% verification rate for CleanSeaNet alerts) would make it compulsory that, upon receiving a CleanSeaNet alert, the national authority has to respond to at least 60% of the alerts. This measure is designed to lead to a higher verification rate in the EU. Six Member States (DK, FI, DE, IT, LT, SI) verified more than 60% of alerts in 2020 and this was the starting point for defining the target. The other Member States would need to increase their verification levels to meet this target. Other (lower) targets were considered based on the latest CleanSeaNet data. However, for the purpose of this impact assessment, an ambitious target has been retained to ensure alignment with the front-running Member States. Stakeholders that responded to consultation activities are mostly against this measure as they do not regard it as efficient.[107]

All policy options achieve alignment with the MARPOL Convention by extending the scope of the Directive to cover all substances discharged illegally into sea of all MARPOL Annexes (PMc1). All policy options introduce new elements over and above Member States obligations to enforce the MARPOL Convention by means of the EU liability regime (further clarified by PMc6), the satellite surveillance tool (further strengthened by PMc1 and PMc7 and access to timely information by PMc5), requirements on types of penalties (PM2a and PM2b), as well as knowledge exchange and capacity building for Member States (PMc2 and PMc3).

In relation to the differences between policy options, PM2 (type of penalty) is included in PO A in the form of PM2a, minimising EU intervention by giving Member States the flexibility to define the type of penalties in their national legislation. In contrast, PM2b and PM3 provides for a harmonised EU approach towards types and levels of penalties and is included in PO B and PO C (PM3a in PO B and PM3b in PO C) which have a broader European angle. More specifically, PM3a included in PO B provides for principles and criteria for levels of administrative penalties, whereas PM3b foresees additionally concrete provisions on values of penalties. PM4 (reporting) is only included in PO B and PO C because this measure works together with PM5b (information to the public on EU website) and it is mutually exclusive with PM5a (information to the public on national websites) which assumes lighter reporting requirements to the Commission but stronger national reporting tools.

5.3. Policy measures and options discarded at an early stage

The following **policy measures** were discarded and not covered in the impact assessment process:

[107] In the stakeholder workshop only 6 out of 41 participants that voted supported this measure. 15 out of 30 participants that voted were of the opinion that the verification of CleanSeaNet alerts should be voluntary. The main issue identified in interviews was the additional resources that would be needed to follow up on such a high proportion of possible pollution incidents detected by CSN service.

- Extend the list of polluting substances covered by the Directive to include air emissions covered by MARPOL Annex VI (e.g. SOx, NOx, VOC, PM);
- Include a provision on minimum requirements on the verification by Member States of possible illegal emission levels (SOx, NOx): national target of 20% verification level per Member State with reference to the number of possible illegal emission levels (SOx, NOx), detected in territorial waters and EEZ for which a THETIS EU/sulphur module alert was generated.
- Extend the list of polluting substances covered by the Directive beyond MARPOL covering pollution of emerging concern (e.g. underwater noise, plastic pellets, more strict than Annex V on animal carcasses or more strict than Annex III on lost containers);
- Limit the extension of the scope of the Directive to align it with the scope of the waste categories of the PRF Directive; and
- Align the SSP Directive's legal regime with MARPOL Article 4(4).
- In addition, one policy option was discarded in the impact assessment process - more specifically the **repeal of the Directive**.
- Details on the reasoning for discarding these policy measures and the policy option are provided in Annex 5.

6. WHAT ARE THE IMPACTS OF THE POLICY OPTIONS?

This section summarises the main expected economic, social and environmental impacts of each policy option.[108] The proposed measures which involve the amendment of the Directive are assumed to be implemented from 2025 onwards, so that the assessment has been undertaken for the 2025-2050 period and refers to EU27 and in particular the 23 coastal Member States. Costs and benefits are expressed as present value over the 2025-2050 period, using a 3% discount rate. Further details on the methodological approach are provided in Annex 4.

The revision aims at improving how ship-source pollution is penalised in the EU. Some measures aim at increasing efficiency and harmonisation of penalties through better definitions, some at enhancing resources for EMSA tools and others at the alignment with other pieces of legislation. Better detection of ship-source pollution is expected to lead to an increased number of identified illegal discharges and penalties for the offenders that would ultimately result in a deterrent effect decreasing illegal discharges from ships because of the long-term dissuasive effect of the penalties and the general awareness of the public and shipping industry that such penalties are imposed. As a result, better protection of the marine environment is expected to be achieved.

MARPOL allows some discharges into sea of waste generated on board a ship, depending on their type, quantity and other conditions. As such, the Directive is not stopping ship-source pollution because it does not set the environmental standards nor prohibit discharges. Against this background, the cost benefit analysis of the MARPOL environmental standards falls outside the scope of this impact assessment.

[108] The analysis in this section is based on *Ricardo (2023), Impact Assessment support study*, and on the analysis of stakeholders' feedback.

6.1. Economic impacts

This section provides the economic impacts of the policy options on the public authorities (Member States administrations, EMSA and the European Commission) and ship operators. It also includes an assessment of impacts on small and medium enterprises (SMEs), the functioning of the internal market, competition and competitiveness.

6.1.1. Impacts on public authorities

Impact on Member States administrations. All three policy options lead to an increase in enforcement costs for the Member States administrations relative to the baseline because they will have to deal with more incidents with the increased scope of the Directive, while they would also result in enforcement costs savings because of the enhancement of the EMSA tools. PO A would additionally result in adjustment costs for the Member States administrations relative to the baseline for the deployment of national websites. Finally, both PO B and PO C are estimated to generate administrative costs savings (see Table 8.). More explanations on each category of costs by policy option are provided below, while the detailed costs and costs savings by policy measure and by Member State (where relevant i.e. PM1), including the assumptions used to derive them, are provided in Annex 4. It should be noted that only the additional costs or costs savings related to the measures included in the policy options are covered in the assessment. The costs due to the MARPOL relevant requirements are not covered here as these steam directly from the ratification of the MARPOL Convention by Member States.

Enforcement costs for Member States administrations. The increase in enforcement costs relative to the baseline are driven by: (i) the extension of the scope of the Directive (PMc1), included in all policy options; (ii) the obligation to log if and how CleanSeaNet alerts have been verified (PMc7), included in all policy options; and (iii) the 60% verification rate for CleanSeaNet alerts (PM1), included only in PO C.

The additional satellite monitoring services by EMSA linked to the extension of the scope of the Directive (PMc1) are expected to result in an increase in the number of CleanSeaNet alerts issued in all policy options. The number of alerts would increase by 8% in 2025 and 58% from 2030 onwards, relative to the baseline, or 209 additional verified alerts in 2025 and 1,530 additional verified alerts from 2030 onwards. The time needed to administer each alert is estimated at one hour[109], and an average hourly labour cost of 39.8 EUR has been assumed for professional, technical and scientific services at EU level (in 2020 prices)[110] to estimate the costs. The costs for Member States administrations for processing the additional alerts are estimated at EUR 8,323 in 2025 and EUR 60,894 from 2030 onwards, relative to the baseline.[111] This is also expected to lead to additional costs for submitting pollution incident reports (POLREPs) in SafeSeaNet and inspection requests in THETIS[112] relating to ship-source pollution, estimated at EUR 1,026 in 2025 and EUR 7,597 from 2030 onwards, relative to the baseline. Thus, the total costs due to PMc1 are estimated at EUR 9,349 in 2025 and EUR 68,491 from 2030 onwards, relative to the baseline (see Table 8). Expressed as present value over the 2025-2050 period, enforcement costs for Member States administrations are estimated at EUR 1.1 million for PMc1 in PO A, PO B and PO C, relative

[109] The median value was used of the estimations provided by BG, CY, FR, PL and RO.

[110] Source: Eurostat [LC_LCI_LEV]

[111] These costs also include those related to the collection and the preparation of the relevant data for CleanSeaNet. They do not include surveillance activities (aerial or by other means) as these requirements are derived from international (i.e. MARPOL) and national legislation pre-existing the SSP Directive.

[112] Member State authorities submit an inspection request related to a suspected illegal discharge (MARPOL infringement) via THETIS (i.e. the EMSA inspection database).

to the baseline. This comprises the cost of collecting and recording the data, but not the cost of verifying the incident on the spot. As explained in section 5.1, national verification assets (aircraft, patrol boat deployment) are outside the scope as Member States have verification obligations directly steaming from their ratification of MARPOL.

The obligation for Member State authorities to log feedback data for all CleanSeaNet alerts, even for those alerts that are not followed-up (PMc7) would result in an additional 5,449 feedback reports being compiled in 2025 and 8,020 feedback reports from 2030 onwards, also considering the extension of the scope in PMc1. The time for completing a feedback report is estimated at 15 minutes. The enforcement costs for Member States authorities are thus estimated at EUR 54,213 in 2025 and EUR 79,799 from 2030 onwards relative to the baseline (see Table 8). Expressed as present value over the 2025-2050 period, the enforcement costs for Member States administrations are estimated at EUR 1.4 million for PMc7 in PO A, PO B and PO C. Similarly to PMc1, this comprises the cost of recording the data and not the cost of verifying the incident on-scene.

The provision on the minimum requirements on the verification by Member States of at least 60% of the CleanSeaNet alerts (PM1) would significantly increase the effort put into verification activities. It would increase efforts of all coastal Member States, except for those six Member States which already verify more than 60% of the alerts in the baseline. The increase in the number of verified CleanSeaNet alerts at EU level is estimated at 528 for 2025 and 775 from 2030 onwards relative to the baseline. The costs were estimated under the assumption that aerial means are used for this purpose as a check of the potential spill by aircraft is most effective. Data collected from three Member States[113] during the stakeholders' consultation, pointed to an average cost of approximately EUR 5,000 per hour for aircraft. On average, an aerial verification is estimated to take 3 hours. The additional enforcement costs for Member States administrations, relative to the baseline, are thus estimated at EUR 7.9 million in 2025 and EUR 11.6 million from 2030 onwards (see Table 8). Expressed as present value over the 2025-2050 period, the enforcement costs for Member States administrations are estimated at EUR 202.7 million for PM1 in PO C. The additional costs by Member State are provided in Annex 4 (section 3)[114].

Total enforcement costs for Member State authorities are the highest in PO C, estimated at EUR 205.2 million expressed as present value over the 2025-2050 period, followed by PO A and PO B with costs estimated at EUR 2.5 million for each relative to the baseline.

Table 8. Costs for Member States administrations by policy option and measure relative to the baseline (in thousand EUR), in 2020 prices

	Difference to the baseline								
	PO A			PO B			PO C		
	2025	2030	2050	2025	2030	2050	2025	2030	2050
Enforcement costs									
PMc1	9.3	68.5	68.5	9.3	68.5	68.5	9.3	68.5	68.5
PMc7	54.2	79.8	79.8	54.2	79.8	79.8	54.2	79.8	79.8
Enforcement costs savings									
PMc5	70.9	103.8	103.8	70.9	103.8	103.8	70.9	103.8	103.8

[113] Average cost per aerial verification based on data provided by Poland, Germany and Finland.

[114] Each Member State will be affected in a different way depending on the size of their coastline, territorial waters and EEZ. Annex 4 provides the impacts on enforcement costs broken down by individual Member State.

	Difference to the baseline								
	PO A			PO B			PO C		
	2025	2030	2050	2025	2030	2050	2025	2030	2050
Enforcement costs									
PM1							7,920.0	11,625.0	11,625.0
Adjustment costs									
PM5a	2,300.0	575.0	575.0						
Administrative costs savings									
PM4				46.7	46.7	46.7	46.7	46.7	46.7

Source: Ricardo (2023), Impact Assessment support study

Adjustment costs for Member States administrations. The adjustments costs relative to the baseline in PO A are driven by the requirement to hold a national website with their identified incidents (PM5a). The cost for developing a website for a Member State is estimated at EUR 100,000 in 2025 (one-off adjustment costs), while the maintenance costs are estimated at EUR 25,000 from 2026 onwards relative to the baseline. At the EU level, the adjustment costs are estimated at EUR 2.3 million in 2025 for developing the 23 national websites[115] plus EUR 0.58 million recurrent annual costs to maintain them (see Table 8). Expressed as present value over 2025-2050 the adjustment costs for Member States administrations relative to the baseline are estimated at EUR 12.3 million (of which EUR 2.3 million one-off costs) in PO A.

Enforcement costs savings for Member States administrations. Enforcement costs savings relative to the baseline for all policy options are driven by the enhanced Integrated Maritime Services (PMc5). The measure is expected to lead to a reduction in the time spent for processing CleanSeaNet alerts, estimated at 30 minutes, instead of one hour per alert. Thus, this is estimated to result in enforcement costs savings for Member States administrations for verifying the CleanSeaNet alerts of EUR 56,897 in 2025 and EUR 83,182 from 2030 onwards. PMc5 would also result in the near elimination of the costs for submitting pollution incident reports (POLREPs) in SafeSeaNet and inspection requests in THETIS relating to ship-source pollution, leading to costs savings of EUR 14,026 in 2025 and EUR 20,597 from 2030 onwards. Thus, the total enforcement costs savings are estimated at EUR 70,923 in 2025 and EUR 103,779 from 2030 onwards (see Table 8). Expressed as present value over the 2025-2050 period, enforcement costs savings for Member States administrations are estimated at EUR 1.8 million.

Administrative costs savings for Member States administrations. The development of a dedicated reporting tool (PM4) in PO B and PO C would lead to significant time savings for reporting to the European Commission under the SSP Directive, which are estimated to be reduced by a factor of three. Thus, the administrative costs savings for Member States administrations are estimated at EUR 46,699 per year (see Table 8). Expressed as present value over the 2025-2050 period, the administrative costs savings for Member States administrations are estimated at EUR 0.9 million for PM4 in PO B and PO C.

Total costs for Member States administrations (enforcement and adjustment costs) are estimated at EUR 205.2 million in PO C, EUR 14.8 million in PO A and EUR 2.5 million in PO B, expressed as present value over the 2025-2050 period. In PO B, the costs are driven by the common policy measures included in all options, while in PO C the largest share of the costs is linked to the 60%

[115] All Member States would need to develop such website, except for AT, CZ, HU and SK that currently do not have flagged vessels nor a coastline.

verification rate for CleanSeaNet alerts (PM1). In PO A, the largest share of the costs is due to the requirement of holding national websites (PM5a).

Total costs savings for Member States administrations (enforcement and administrative costs) are estimated at EUR 2.7 million in PO B and PO C and at EUR 1.8 million in PO A, expressed as present value over the 2025-2050 period. The cost savings are driven by the reduced time for verifying the CleanSeaNet alerts thanks to the enhanced Integrated Maritime Services (PMc5) included in all policy options and also by the dedicated reporting tool (PM4) in PO B and PO C. Overall, PO B results in net costs savings for Member States administrations of EUR 0.2 million, expressed as present value over the 2025-2050 period relative to the baseline, while PO A in net costs of EUR 13 million and PO C in net costs of EUR 202.5 million.

Impact on EMSA. All policy options lead to *adjustment costs for EMSA* relative to the baseline (see Table 9). The adjustment costs relative to the baseline are driven by four policy measures included in all options: (i) the extension of the scope of the Directive (PMc1); (ii) training and guidance (PMc2); (iii) information from whistle-blowers (PMc4); and (iv) the enhanced Integrated Maritime Services (PMc5). In addition, the new reporting tool (PM4) and the information to the public on EU website (PM5b) would result in adjustment costs relative to the baseline for both PO B and PO C.

The alignment of the Directive to MARPOL, by extending the scope of the Directive (PMc1), requires the establishment of additional satellite monitoring services by EMSA to Member State authorities. The adjustment costs are estimated by EMSA at EUR 1.9 to 2.4 million for Annex III (annual recurrent costs), relative to the baseline, for the deployment of high and very high resolution radar and optical imagery (VHR), to follow relevant incidents[116]. Annex IV and V pollutants would already be detectable through the CleanSeaNet. However, the detection accuracy would benefit from additional medium resolution optical Sentinel-2 type monitoring and from increasing the monitoring volume. EMSA estimates that these upgrades to the CleanSeaNet would require an additional EUR 2.6 million annually from 2025 onwards, relative to the baseline. These upgrades could also benefit the detection of substances under the current scope of the SSP Directive. The costs encompass related IT development and operation. In addition, nine full time equivalents would be needed by EMSA to support the provision of the additional satellite monitoring services, estimated at EUR 1 million per year from 2025 onwards. Additional technical support from EMSA to Member States, to support verification activities, could also take the form of remotely piloted aircraft systems (RPAS) operations. The number of operations performed annually would however depend on Member States interest in such type of system. As such type of support is not explicitly required by the SSP Directive and the interest by the Member States in such type of operations is not known at this stage, the RPAS operations are not included in the costs. Thus, the total adjustment costs for EMSA in PMc1 are estimated at EUR 5.5 to 6 million per year relative to the baseline from 2025 onwards (see Table 9). Expressed as present value over 2025-2050, they amount to EUR 101.6 to 110.5 million for PO A, PO B and PO C.

PMc2 foresees training to national authorities. The adjustment costs for EMSA are estimated at one-off costs of EUR 100,000 in 2025 for developing the training session, and annual costs of EUR 50,000 for the reimbursement of participants from 2025 onwards, relative to the baseline. These costs estimates, provided by EMSA, are based on past similar projects and training sessions and they include costs related to human resources. The adjustment costs for the development of

[116] The estimation of costs is based on the assumed need to survey 80 incidents annually at a cost of EUR 24,000 to 30,000 per incident.

guidance documents[117] (PMc2) are estimated at EUR 400,000 in total relative to the baseline in 2025 (one-off costs). In addition, costs of EUR 80,000 per year are foreseen from 2026 onwards for providing regular updates to the guidance documents, in consultation with Member State authorities. Thus, the total adjustment costs for EMSA in PMc2 are estimated at EUR 500,000 one-off costs in 2025 and EUR 130,000 annual costs from 2026 onwards. Expressed as present value over 2025-2050, the adjustment costs for EMSA due to PMc2, relative to the baseline, are estimated at EUR 2.8 million (of which EUR 0.5 million one-off costs in 2025) in PO A, PO B and PO C.

The provision on whistle-blowers (PMc4) concerns the development of an external reporting channel for whistle-blowers, to submit information in an anonymised way. The adjustment costs are estimated by EMSA at EUR 50,000 for the development of a module to the EMSA tool (one-off costs in 2025) plus EUR 10,000 per year from 2026 onwards for its maintenance (see Table 9). Expressed as present value over 2025-2050, the adjustment costs for EMSA relative to the baseline are estimated at EUR 0.2 million in PMc4 for all policy options.

The enhanced Integrated Maritime Services (PMc5) is expected to result in development costs estimated by EMSA at EUR 2 million (one-off costs in 2025) plus maintenance costs of EUR 300,000 per year from 2026 onwards, relative to the baseline. In addition, three full time equivalents would be needed by EMSA to support the development of the Integrated Maritime Services, estimated at EUR 330,000 per year from 2025 onwards. Expressed as present value over 2025-2050, the adjustment costs for EMSA for this measure are estimated at EUR 13.3 million (of which EUR 2 million one-off costs) in PO A, PO B and PO C.

The development and maintenance of a new reporting tool (PM4) is estimated to add costs of EUR 250,000 (one-off costs in 2025) for the development of the tool and EUR 180,000 recurrent annual costs for the maintenance of the tool from 2026 onwards in PO B and PO C (see Table 9). Expressed as present value over 2025-2050 the adjustment costs relative to the baseline are estimated at EUR 3.4 million (of which EUR 0.3 million one-off costs) in PO B and PO C.

Finally, the online tool by EMSA for keeping the public informed about ship-source pollution (PM5b) is estimated to cost EUR 100,000 (one-off costs in 2025) for developing the website and EUR 65,000 (recurrent annual costs) from 2026 onwards for maintenance[118], based on similar projects by EMSA (see Table 9). The website would draw inputs from the EMSA tools as well as collect Member States inputs. Expressed as present value over 2025-2050 the adjustment costs for EMSA due to PM5b relative to the baseline are estimated at EUR 1.2 million (of which EUR 0.1 million one-off costs) in PO B and PO C.

Total adjustment costs for EMSA are estimated at EUR 122.6 to 131.4 million in PO B and PO C and at EUR 118 to 126.8 million relative to the baseline, expressed as present value over 2025-2050. The common measures included in all policy options account for EUR 118 to 126.8 million of these total costs, thus for 100% of the total costs in PO A and for 96% of the costs in PO B and PO C.

Table 9. Adjustment costs for EMSA by policy option and measure relative to the baseline (in thousand EUR), in 2020 prices

	Difference to the baseline								
	PO A			PO B			PO C		
	2025	2030	2050	2025	2030	2050	2025	2030	2050
Adjustment costs									

[117] One focusing on "Tools for gathering evidence and types of evidence used" and the other on "Monitoring and detection tools".

[118] Including for human resources.

	Difference to the baseline								
	PO A			PO B			PO C		
	2025	2030	2050	2025	2030	2050	2025	2030	2050
PMc1									
Low	5,520.0	5,520.0	5,520.0	5,520.0	5,520.0	5,520.0	5,520.0	5,520.0	5,520.0
High	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0
PMc2	550.0	130.0	130.0	550.0	130.0	130.0	550.0	130.0	130.0
PMc4	50.0	10.0	10.0	50.0	10.0	10.0	50.0	10.0	10.0
PMc5	2,330.0	630.0	630.0	2,330.0	630.0	630.0	2,330.0	630.0	630.0
Adjustment costs									
PM4				250.0	180.0	180.0	250.0	180.0	180.0
PM5b				100.0	65.0	65.0	100.0	65.0	65.0

Source: Ricardo (2023), Impact assessment support study

Impact on the European Commission. The adjustment costs for the European Commission are driven by two policy measures: (i) the expert group (PMc3), that is common to all policy options; (ii) the development of an implementing act on the criteria for levels of administrative penalties (PM3a), that is included only in PO B.

In PMc3, one meeting per year is assumed to be organised by the Commission in person, to exchange lessons learned and enable cooperation between Member States. The costs are estimated at EUR 30,000 per year on average for the reimbursement of participants, from 2025 onwards relative to the baseline. Expressed as present value over 2025-2050, the adjustment costs for the Commission relative to the baseline are estimated at EUR 0.6 million for PMc3 in all policy options. The adjustment costs for developing the implementing act on penalties (PM3a) by the Commission are estimated at EUR 200,000 (one-off costs in 2025) in PO B. Thus, the *total adjustment costs for the European Commission*, expressed as present value over 2025-2050, are estimated at EUR 0.8 million in PO B and EUR 0.6 million in PO A and PO C.

6.1.2. Impact on ship operators

The SSP Directive does not currently impose any action on businesses. None of the policy options include requirements for ship operators. The costs of preventing illegal discharges on board of ships have already occurred for ship operators, to ensure compliance with the MARPOL international regulations through pollution prevention procedures implemented by their fleets. However, more effective detection and penalising, may lead to more fines for non-compliant ship operators in the first years of its implementation. This is eventually expected to have a deterrent effect on non-compliant ship operators in the long-term. The core of the Directive is thus to ensure an effective support to national enforcement of the international regulations (MARPOL standards). No costs are expected for the compliant ship operators. At the same time, the indirect environmental benefits due to less illegal discharges are expected to benefit all ship operators.

6.1.3. Impact on SMEs

The proposed policy options do not include requirements for ship operators and are thus not expected to have an impact on SMEs. The extension of the Directive's scope to cover additional substances under MARPOL (and notably Annex IV and V) may be relevant for recreational craft and fishing vessels, sector segments with high SME participation. However, the fact that this extension is focused on the enforcement of international regulations means that no impact on costs is expected for the compliant SMEs and the costs for managing polluting substances generated on board have already been present. The initiative can therefore be considered non-relevant for SMEs.

6.1.4. Functioning of the internal market and competition

Improving the detection (surveillance) and penalising (deterrence by means of penalties) is expected to contribute to a level playing field, with a positive impact on the functioning of the internal market and competition. A more harmonised regulatory framework across the Member States should ensure that shipping companies do not face different requirements and levels of penalties in each Member State for violating MARPOL rules. This decreases the risk of regulatory arbitrage when some Member States have less stringent penalties or lower likelihood of applying penalties than others in the region. The most relevant measure for the functioning of the internal market and competition are those that are expected to contribute to the improved detection of potential pollution (PMc1), included in all policy options. In all policy options, keeping the public informed about ship-source pollution incidents (PM5) may reduce information asymmetries and have a dissuasive effect through reputational damage of ship operators involved in pollution incidents. Data integration and EMSA support (PMc5) may allow to synthesise information on ships that are suspected of non-compliance and to produce valuable analytical insights, including on their past behaviour, thus leading to improved effectiveness of the identification of potential polluters.

6.1.5. Impact on competitiveness

The policy options aim to enhance the detection of pollutants discharged, by improved surveillance and support for Member State enforcement. The SSP Directive and the proposed policy options do not distinguish between EU and non-EU offenders. They cover all ships, irrespective of their flag, with the exception of warships, naval auxiliary and ships for government non-commercial use. The Directive also includes the requirement to comply with UNCLOS Article 230, where it is specified that penalties for infringements of foreign vessels beyond the territorial waters of Member States shall involve monetary penalties provided that specific conditions are met. Thus, there is no competitive distortion in favour of or against EU or non-EU entities. As explained in section 6.1.2, no additional costs are expected for the compliant ship operators in the three policy options. Ports and port reception facilities may be affected by an increased collection of waste at ports. This is however not expected to impact the competitiveness of the sector. The Port Reception Facilities (PRF) Directive has been revised in 2019 and recently brought into force. Thanks to the new rules, the facilities in ports and their infrastructure have recently been improved to allow for an increased collection of waste. Therefore, no additional costs for improved facilities and infrastructure are expected compared to those bared by the Member States for the implementation of the revised PRF Directive, which are part of the baseline. Therefore, it can be concluded that neither of the three policy options would affect the competitiveness of the maritime sector.

6.2. Social impacts

Social impacts are mainly assessed in terms of impacts on working conditions, fundamental rights, and public health.

6.2.1. Impacts on working conditions and skills

The impact of the policy options on working conditions is expected to be positive, although it has not been possible to quantify it. By improving pollution prevention, the policy options could potentially result in indirect health benefits for seafarers who are expected to be less exposed to the harmful substances. This may also improve the attractiveness of employment in the sector to some limited extent. Increased knowledge sharing and enhanced exchange of best practices are expected to reduce illegal discharges of polluting substances under all policy options. This could have a positive impact on working conditions, since seafarers will be better equipped to manage ship generated waste and understand their respective obligations. Further, under all policy options,

seafarers will potentially be more accustomed with whistle-blower protection guaranteed in the EU. This will contribute to the development of a responsible work ethic, by fostering a safe environment for seafarers and other natural persons who acquired information on breaches in the context of their work-related activities to report on potential illegal practices and possibly improve the attractiveness of the seafarer profession in general. In addition, more clarity with regards to the exception from liability for crew, masters and companies under all policy options will delineate more clearly the obligations of seamen in general, to the benefit of everyday working conditions, where (intentional) operational discharges are a reality. With regards to crew in particular, it could safeguard that seafarers are not unjustifiably blamed for behaviours that they could not control or which were not within the remit of their attributed duties as members of the crew. Thus, with respect to the working conditions all policy options are expected to have a moderate positive impact.

6.2.2. Impacts on fundamental rights

The Charter of Fundamental Rights of the European Union (the Charter), as an instrument of primary EU law, enshrines the fundamental rights people enjoy in the EU. Overall, the three policy options are expected to lead to better performance towards fundamental rights protection and an individual's freedoms especially with regards to justice, fair trials, non-discrimination, equal treatment of perpetrators and the principle of legality, the right to proportionate and effective penalties. The clarification on the exception form liability, as part of the EU liability regime,[119] under all policy options will specifically cover the exception concerning the liability of crew and reinforce their protection through more integrated harmonisation of international rules in national laws and better observance of the rule of law and fair trial principles (See Annex 6, PMc6 for details). It further safeguards the principle of equality, contributing to non-discrimination and equal treatment of seafarers. The measures ensuring clearer delimitation between the infringements falling within the criminal and administrative procedure will facilitate fair trials, non-discrimination, equal treatment of perpetrators and the principle of legality. All three policy options will result in better observance of the right to justice and maintain full respect of human and fundamental rights.

6.2.3. Health of the public

Ship-source pollution has an impact on the marine environment and, therefore, on the water quality of bathing sites. Low quality of the water can be harmful to the human health. Human health may be negatively impacted by various types of pollution including ship pollution to sea in a variety of ways. For instance, sewage (e.g. from cruise ships) contains nutrients and may contribute to toxic algae blooms. Additionally, exposure to chemicals can harm the nervous system, interfere with endocrine signalling, or increase the risk of cancer. Vulnerable population is disproportionately affected by such health impacts.[120] Moreover, the health benefits from consuming fish products from European seas must be taken into consideration in this context. Some fish species contain contaminants such as methylmercury, dioxins and polychlorinated biphenyls.[121]

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[119] For the purpose of this report the 'EU liability regime' relates to persons (natural or legal) being held accountable for an illegal discharge - for example, the company or master of the ship is responsible for an illegal discharge if committed carelessly or with the intention to cause damage subject to the exceptions from liability provided by MARPOL.

[120] Landrigan, P. et al., 2020. Human health and ocean pollution, s.l.: Ann Glob Health

[121] Overall, the health impact of fish consumption has been assessed to be beneficial despite the contamination concerns. Research shows that fish consumption does more benefit than harm. Source: Ni Li et al. 2020. Trends in Food & Technology. Fish consumption and multiple health outcomes: Umbrella review https://www.sciencedirect.com/science/article/pii/S0924224419310532

All policy options are expected to lead to positive indirect impacts on public health. The extension of the scope of the Directive to all MARPOL Annexes (PMc1), included in all policy options, is expected to have the largest positive impact on public health. Other measures with a potential impact on the marine environment are those related to improved surveillance and detection capacity as well as more transparent information for the public, included in all policy options. These are expected to discourage ships from intentional discharge of waste into sea and lead to an improvement in the quality of water. This in turn is likely to indirectly result in an improvement in the health status of individuals that use EU bathing sites or consume fish products from European seas. Geographical areas close to the coast are mostly affected by disruptions in the marine environment and therefore would be positively affected to a higher extent by this initiative.

6.3. Environmental impacts

This section provides an assessment of the environmental impacts of the policy options. All policy options are expected to have a positive yet indirect impact on the environment, driven by the reduction of illegal discharges through the deterrent effect of penalties, the awareness raising as well as reputation considerations. Due to serious data limitations concerning the volumes of potential illegal discharges of different polluting substances and the penalties applied, a quantitative assessment was only possible for PMc1 in relation to oil waste[122]. This is complemented by a qualitative assessment of the impacts of all policy measures included in the three policy options.

As explained in section 6.1.1, the upgrades to the CleanSeaNet in PMc1 (included in all options) is expected to also benefit the detection of substances under the current scope of the SSP Directive (i.e. oil). The amount of oil discharged in EU seas by 2015 was estimated at 31,000 m^3/year[123], i.e. approximately 27,280 tonnes. In the baseline scenario the oil discharged in European seas is projected to remain stable over time (see section 5.1). According to a study commissioned by the European Parliament[124], the external cost of a discharge of a tonne of oil in the sea amounts to approximately EUR 290,000[125,126]. For the purpose of the assessment, a conservative assumption has been used - namely, a reduction by 0.5% in the volume of oil illegally discharged relative to the baseline from 2030 onwards. The reduction is gradually phased-in between 2025 and 2030, taking into account the growth in the number of CleanSeaNet alerts in the policy options. The reduction is the same in all policy options due to the fact that PMc1 is included in all options. Over the 2025-2050 period, it is estimated that 3,411 tonnes of MARPOL Annex I, oil discharges would be prevented. The reduction in the external costs, expressed as present value over 2025-2050, is estimated at EUR 690.5 million relative to the baseline. More details are provided in Annex 4 (section 4).

There is high uncertainty related to these estimates due to the serious data limitations and the limited input from stakeholders received during the consultation activities. To acknowledge the high level

[122] It should also be noted that there is significant uncertainty regarding the quantitative assessment of the impacts of PMc1 in relation to oil waste, due to serious limitations in the data availability and limited stakeholder input in the consultations. For this reason, the assessment of the impacts of PMc1 has been complemented by sensitivity analysis.

[123] European Commission (2018). Commission staff working document, Impact Assessment on port reception facilities for the delivery of waste from ships

[124] https://www.europarl.europa.eu/RegData/etudes/note/join/2007/379227/IPOL-TRAN_NT(2007)379227_EN.pdf

[125] This value, expressed in 2020 prices, corresponds to the unit damage cost caused by one ton of oil discharged in the sea. The unit damage cost is independent of the evolution of the volume of oil discharges over the period 2007-2021 and over the assessment period of the policy options (2025-2050).

[126] The same report indicates that only 0.22% of all external costs of oil substances discharged can be attributed to permitted oil spills, suggesting that the majority of the external costs are a result of illegal discharges.

of uncertainty, sensitivity analysis has been additionally performed. Two additional cases have been considered, assuming 0.3% and 0.7% reduction in the volume of oil discharges relative to the baseline from 2030 onwards. As for the central case, the reduction is gradually phased-in between 2025 and 2030, taking into account the growth in the number of CleanSeaNet alerts. Thus, 1,501 to 5,320 tonnes of oil are estimated to be prevented over 2025-2050, that would result in a reduction of the external costs estimated at EUR 312.8 to 1,068.3 million, expressed as present value over 2025-2050 (see Table 10). It should however be acknowledged that even the 0.7% reduction could be considered as conservative, not least because it disregards the additional benefits brought by the prevention of other polluting substances (MARPOL Annex II-VI), which are introduced in the proposed extension of the scope of the Directive (PMc1). These could not be quantified due to the lack of data.

Table 10. Potential environmental benefits for the policy options relative to the baseline, including sensitivity analysis, over 2025-2050

	Volume reduction (in tonnes)[127]	External costs reduction (in million EUR)[128]
Benefits – 0.3% reduction	1,501	312.8
Benefits – 0.5% reduction (central case)	3,411	690.5
Benefits – 0.7% reduction	5,320	1,068.3

Source: Ricardo (2023), impact assessment support study

The estimated reduction in the level of oil discharges is an indicator of the indirect impact of the policy options covering one out of the six waste categories/ MARPOL Annexes. Due to the significant data gaps, estimating the indirect impacts on Annex II-VI pollutants was not possible. The estimated reduction in oil discharges indirectly links to the level of ambition of the Directive: the aim is to prevent the intentional illegal discharge in the future by penalising current illegal discharges. However, it should be noted that the aim is not to directly reduce the pollution from ships, as some substances can be legally discharged based on MARPOL rules. The envisaged ambition of the Directive is measured through the response rate of Member States to the identified pollution incidents, ultimately leading to penalising the identified offenders.

In the future, the intentional illegal discharges from ships are expected to be of smaller size and more difficult to detect.[129] With accelerating technological development and hyperconnectivity of all systems, as acknowledged by the 2021 Strategic Foresight Report[130], EMSA services are expected to change much faster in the coming decades and surveillance capacity to increase. Thus, the benefits due to the reduction in external costs may also be higher.

To complete the limited quantitative indication of benefits, a qualitative assessment of the environmental benefits by policy measure and policy option is further provided in Table 11 below.

Table 11. Qualitative assessment of environmental impacts by policy option and policy measure relative to the baseline

Policy measure	PO A	PO B	PO C	Comments

[127] Cumulative over 2025-2050.
[128] Expressed as present value over 2025-2050.
[129] DNV Group Research and Development (2022) Ocean's Future to 2050, a sectorial and regional forecast of the Blue Economy
[130] 2021 Strategic Foresight Report | European Commission (europa.eu)

Policy measure	PO A	PO B	PO C	Comments
PMc1 – Extend the scope of the Directive to polluting substances under MARPOL Annex III-V and to discharge water from scrubbers under MARPOL Annex VI and include a review clause to encompass future developments of the MARPOL Convention.	++++	++++	++++	This is one of the measures that is expected to have the highest positive effect on the environment relative to the baseline because substances other than oil (e.g. sewage, garbage) will be brought in the legal scope of the Directive. This measure complements the Port Reception Facilities Directive, which already covers more MARPOL Annexes and encourages disposal of such waste at ports. The consequent deterrent effect is expected to be the highest among the measures because it covers penalties for a broader range of pollutants, while also benefiting the detection of oil through upgrades of the CleanSeaNet (i.e. 3,411 tonnes of oil discharges prevented over 2025-2050). The impact is expected to be the same in all policy options.
PMc2 - EMSA provides training and guidance to authorities responsible for detection, verification and evidence collection.	+	+	+	Specific training and guidance is expected to improve the expertise and therefore also the enforcement capabilities of national authorities, leading to more effective prosecution - hence a slight deterrent effect relative to the baseline. The dissuasive impact of training is limited due to the uncertainty in its link with the enforcement capabilities in Member States. The impact is expected to be the same in all policy options.
PMc3 - The Commission establishes a dedicated expert group facilitating cooperation between Member States, including through the adoption of guidelines.	+	+	+	The expert group (and the guidelines stemming from it) is expected to improve the expertise and the enforcement capabilities of national authorities, leading to more effective prosecution - hence a deterrent effect relative to the baseline. The impact of the measure is however expected to be limited because it is uncertain and indirect. The impact is expected to be the same in all policy options.
PMc4 – Inclusion of a provision on whistle-blowers, their protection and means of passing the relevant information.	+	+	+	This measure provides selected stakeholders (whistle-blowers) with the possibility to inform Member States' authorities about illegal discharges. It is however unclear how this possibility will be used in practice. Therefore, the impact is expected to be limited relative to the baseline, under a conservative assessment. The impact is expected to be the same in all policy options.
PMc5 – EMSA further enhances the data exchange tools and automated links in the Integrated Maritime Services based on CleanSeaNet, THETIS, THETIS EU and SafeSeaNet.	+++	+++	+++	Making use of the existing information more systematically and further enhancing automatic links to obtain targeted information is likely to result in positive impacts on the environment relative to the baseline. Integrated EU-wide tools providing better information to the Member States authorities, would lead to better enforcement and more effective penalties. The impact is assessed to be significant because of the relation between better information on possible detections and better enforcement. The impact is expected to be the same in all policy options.
PMc6 – The exception from liability for polluters, including crew members, will be further clarified in the Directive.	0	0	0	This measure provides clarification of the existing legal framework on exceptions from liability. Therefore, it is not expected to result in environmental benefits relative to the baseline. PMc6 has however a positive social impact on the legal protection of the crew. The impact is expected to be the same in all policy options.

Policy measure	PO A	PO B	PO C	Comments
PMc7 - Obligation for Member States to log their feedback data in CleanSeaNet and document if and how CleanSeaNet alerts have been verified.	++	++	++	PMc7 obliges Member State authorities to register their verification activity following a CleanSeaNet alert. The availability of information on Member States' verification activities (and methods used) would enable the assessment of their effectiveness. The measure is expected to have a positive environmental impact relative to the baseline thanks to gathering representative data more systematically and increased transparency on national verification decisions and their justification, resulting in peer pressure between the Member States. Similarly to PM4 and PM5a, it is expected to have a medium positive effect. The impact is expected to be the same in all policy options.
PM1 – Inclusion of a provision on minimum requirements for verification by means of a national target of 60% verification rate for CleanSeaNet alerts.			++++	There is a potential for an increased deterrent effect associated with PM1, obliging Member States to verify a high share of CleanSeaNet alerts. This measure will lead to more on-scene verifications by Member States relative to the baseline. This should discourage polluters because patrols (boats, aircraft) will be seen more often at sea in the EU. Furthermore, with increased verification activities, the probability of confirming a spill and taking further action against the polluter is likely to increase relative to the baseline. This high deterrent effect is expected for PO C only.
PM2a – Each Member State defines in their national legal order the components of infringements, either on the basis of 'minor cases' and 'deterioration of the quality of water', or on any other basis prescribed by the Directive, and applies administrative or criminal penalties accordingly.	0/+			This measure provides clarification of the existing legal framework on defining infringements for the purpose of applying administrative penalties under the Directive, without prejudice to the new rules under the Environmental Crime Directive foreseen in the baseline. PM2a is expected to result in very limited or no environmental benefits for PO A relative to the baseline because it does not change the existing legal regime.
PM2b – The Directive provides definitions of the components of infringements, either on the basis of 'minor cases' and 'deterioration of the quality of water' or on any other basis prescribed by the Directive.		+	+	PM2b offers a harmonised approach on defining infringements for the purpose of applying administrative penalties under the Directive, without prejudice to the new rules under the Environmental Crime Directive foreseen in the baseline. It would result in more consistent administrative regimes expected to raise the bar for some countries. This measure is expected to have a small positive effect on the environment relative to the baseline, resulting from the improved effectiveness of the penalties achieved by the harmonised definition. For this reason, it is expected to lead to higher environmental benefit than PM2a, which proposes an individual approach by Member States. Benefits on the marine environment are expected to be small and indirect also because the measure does not prescribe enforcement rules. The impact is expected to be the same in PO B and PO C.

Policy measure	PO A	PO B	PO C	Comments
PM3a – The Directive provides principles for setting the level of administrative penalties. The Commission will develop an implementing act on the criteria to be applied (e.g. depending on type of polluting substances).		+		PM3a defines rules on when to apply which level of penalty depending on the circumstance e.g. the substance involved or the size of the spill. The deterrent effect in PO B relative to the baseline comes from improved proportionality of the penalties, thanks to the clarity on the principles and criteria for setting the levels of penalties. The impact on the environment is expected to be small because it is indirect and of legalistic nature. The impact is expected to be in PO B only.
PM3b – The Directive provides principles for setting the level of administrative penalties, the criteria to be applied (e.g. depending on type of polluting substances) as well as values for the maximum and minimum levels for administrative penalties.			++	This measure provides for a harmonisation of minimum values of penalties at EU level. The deterrent effect in PO C results from improved dissuasiveness of the penalties thanks to the clarity on principles and criteria for setting the levels of penalties as well as on the minimum values of penalties. PM3b offers a stronger regulatory approach towards the levels of penalties than PM3a. The positive environmental impact relative to the baseline is expected to be slightly higher than that of PM3a because the underperforming Member States are expected to raise the values of their penalties coherently. The impact is expected to be in PO C only.
PM4 – Obligation for Member States to report their data in an EMSA-managed tool on each ship-source pollution incident.		++	++	PM4 is designed to facilitate the work of Member States in reporting to the Commission (and to their citizens in conjunction with PM5b). The measure is expected to improve the information on the effectiveness of verification and prosecution, allowing gathering more representative data systematically, enabling peer pressure between the Member States and an increased transparency on national verification decisions and their justification. Similarly to PMc7 and PM5a, it is expected to result in a deterrent effect relative to the baseline. The impact is expected to be the same in PO B and PO C.
PM5a – Member States inform the public about ship-source pollution incidents through a national website. Member States may also report this data to the Commission.	++			Increased availability of information to the public on ship-source pollution incidents is expected to increase transparency and public scrutiny in PO A. Public attention may indirectly provide better prioritisation of preventive measures, more peer pressure between the Member States and an increased transparency on national verification decisions and their justification. Similarly to PMc7, PM4, it is expected to result in a deterrent effect relative to the baseline. The impact is expected in PO A only.
PM5b – EMSA publishes online key EU information reported by Member States about ship-source pollution incidents.		+++	+++	Increased public scrutiny and reputational issues faced by polluters provide for an opportunity to improve the SSP Directive's effectiveness. PM5b is expected to lead to a somewhat higher positive impact on the environment than PM5a, thanks to the centralisation of the information available to the public. Public scrutiny is expected to be enhanced by avoiding that citizens have to navigate between different national websites to find the information and can compare countries. This results in a deterrent effect relative to the baseline for PO B and PO C.

Note: A scoring system is used to compare the options with the baseline scenario. From "0" (no difference from the baseline) to "++++" (significant positive impact compared to the baseline).

PO C is expected to lead to higher environmental benefits than PO B due to the 60% verification rate for CleanSeaNet alerts (PM1) and the stronger regulatory approach to the levels of penalties (PM3b) which together would increase the deterrent effect. Provisions on mandatory requirements for Member States on following up pollution incidents and penalising the offender are likely to result in higher environmental benefits than relying on voluntary cooperation and information

exchange between Member States and offering flexibility to the Member States as well as soft measures. On the other hand, the environmental benefits of PO A are expected to be lower than those of PO B because the cross-border nature of the problem would be less mitigated by means of cross-border cooperation and information exchange. It is expected that Member States will be more proactive in PO B and PO C, relative to PO A, due to the synergies coming from the common framework as opposed to individual national approaches e.g. in PM2a and PM5a.

Overall, PO C is expected to result in the highest environmental benefits with its regulatory measures, closely followed by PO B, whereas lowest environmental benefits are expected for PO A due to lost opportunities for cooperation, with a limited common framework.

In brief, it was not possible to quantify the environmental impacts from avoided ship-source pollution for all the measures included in the policy options, but as shown above, the impacts are expected to be positive in all policy options. All policy options contribute towards SDG 14 ("Conserve and sustainably use the oceans, seas and marine resources for sustainable development").

No significant harm is expected on the environment in the three policy options, in particular in the area of sustainable use and protection of water and marine resources to which the initiative relates. On the contrary, as explain above, all three policy options are expected to have a positive impact on the marine environment. All policy options are consistent with the environmental objectives of the European Green Deal and the European Climate Law[131]. The focus of the SSP Directive on the deterrent effect of penalties reflects the pollution prevention angle of the Green Deal with respect to discharges from ships into sea. As for tackling climate change and emissions to air, the air related problem drivers and policy measures were discarded in the impact assessment because these have a separate approach to regulation and enforcement both at IMO and EU level. More detailed explanations are provided in Annex 5.

7. HOW DO THE OPTIONS COMPARE?

7.1. Effectiveness

The assessment of effectiveness looks at the extent to which the general and specific objectives (SO) of the intervention, as previously described, are met. Table 12 provides the link between policy objectives and assessment criteria. Annex 7 provides a more detailed overview on the effectiveness of the policy options in relation to the specific objectives.

Table 12. Link between objectives and assessment criteria

Objectives	Assessment criteria
General objective: In line with the European Green Deal, the aim is to incorporate international standards for ship-source pollution into the sea into EU law and to ensure that persons responsible for discharges of polluting substances into sea are subject to effective, proportionate and dissuasive penalties, in order to improve maritime safety and to enhance protection of the marine environment from pollution by ships	Expected deterrent effect on the level of illegal discharges into sea
SO1: Incorporate international standards into EU law by aligning the Directive with MARPOL Annexes on discharges into sea	Expected increase in the level of detection of illegal discharges (oil, noxious substances, packaged goods, sewage, garbage and scrubber discharge water) resulting in expected decrease in the number of infringements

[131] Regulation(EU) 2021/1119

Objectives	Assessment criteria
SO2: Support Member States by building their capacity to detect pollution events, verify, collect evidence and effectively penalise identified offenders in a timely and harmonised manner	Expected increase in the level of verification of potential illegal discharges Proportion of identified offenders as a result of verification
SO3: Ensure that persons (natural & legal) responsible for illegal discharges from ships are subject to effective, proportionate & dissuasive penalties	Level and type of penalties is effective, proportionate and dissuasive
SO4: Ensure simplification and effective reporting on ship-source pollution events and follow-up activities	Expected improvement in the reporting on the implementation of the Directive

By design, each of the three policy options is developed in a way that addresses all four problem drivers and specific objectives. They achieve the objectives however at different degrees.

Concerning the **general objective**, the increased deterrent effect (consequently reduced level of illegal discharges) relative to the baseline benefits the marine environment to a different extent. PO C is expected to have a higher deterrent effect than PO B due to the provision on the 60% verification rate for CleanSeaNet alerts (PM1) and the stronger regulatory approach towards the levels of penalties (PM3b). The deterrent effect of PO A is expected to be lower than that of PO B given the fact that the cross-border nature of the problem is less mitigated by means of cooperation and information exchange (PM2a, PM5a). However, it should be noted that there is high uncertainty regarding the environmental benefits of the policy options in terms of the deterrence of illegal discharges into sea, especially because of the limited data available on the volumes of illegal discharges of the polluting substances and the penalties applied.

Concerning **SO1**, all policy options aim to extend the scope of the Directive (PMc1) as to align with the MARPOL scope of substances discharged into sea (Annexes I to VI). Progress towards this specific objective is assessed through the increase in the level of detection of illegal discharges (oil, noxious substances, packaged goods, sewage, garbage and scrubber discharge water) by ships and the long-term decrease in the number of infringements relative to the baseline (thanks to the deterrent effect). The additional number of illegal discharges detected relative to the baseline and the reduced number of infringements is expected to be the same in all policy options, driven by PMc1 and in particular by the provision of additional satellite surveillance (CleanSeaNet). In addition, all policy options future-proof the Directive by enabling to adjust to potential changes in the existing MARPOL Annexes, thanks to a review clause (also in PMc1). Thus, all policy options are equally effective in achieving SO1.

Concerning **SO2**, Member State capacity to detect, verify and prosecute infringements would improve in all policy options. Progress towards this specific objective is assessed through the increase in the level of verification of potential illegal discharges as well as the increased proportion of identified offenders as a result of verification. All three policy options contribute towards SO2 through the increased use of knowledge and data sharing (PMc2, PMc3 and PMc5) for the extended list of polluting substances as well as the potential information provided by whistle-blowers (PMc4). PO C is however more effective than PO A and PO B in achieving SO2 due to potentially higher verification levels relative to the baseline, driven by the introduction of the mandatory requirement in relation to the verification of CleanSeaNet alerts (PM1).

Concerning **SO3**, progress is measured by checking if the level and type of penalties is effective, proportionate and dissuasive. PO A has a limited impact on ensuring that offenders are subject to proportionate penalties because of keeping the status quo i.e. leaving it to the Member States to decide on the level of penalties. However, PO A offers improvements in the prosecution process by the clarification of exceptions at EU level (PMc6) and at national level (PM2a) which could consequently have a positive impact on the application of penalties. PO B and PO C are more

effective in achieving SO3 than PO A thanks to the rules on setting the level of administrative penalties (PM3a and PM3b, respectively) and the harmonisation of values of penalties at EU level in PO C (PM3b).

Concerning **SO4**, progress is measured by the improved reporting on the implementation of the Directive. All policy options are assessed to be effective in achieving SO4, thanks to the obligation to log if and how CleanSeaNet alerts have been verified (PMc7). However, PO B and PO C are more effective than PO A (with the national approach of PM5a) because of the economies of scale linked to the EU-wide tools provided by EMSA (PM4 and PM5b).

Overall, PO C is assessed to be the most effective in achieving the general and specific objectives, followed by PO B and PO A. The assessment of effectiveness is further detailed in Annex 7.

7.2. Efficiency

Efficiency concerns "the extent to which objectives can be achieved for a given level of resource/at least cost". The major costs of the policy options come in the form of adjustment costs for EMSA in all three policy options and enforcement costs for Member States administrations in PO C. They are summarised in Table 13.

PO C leads to the highest total costs among the three policy options, estimated at EUR 328.3 to 337.2 million relative to the baseline, expressed as present value over 2025-2050. The highest costs in PO C are the enforcement costs for Member States administrations for the 60% verification rate for CleanSeaNet alerts (PM1). The adjustment costs for EMSA, mainly related to the provision of additional satellite surveillance services to Member State authorities required by the extension of the scope of the Directive (PMc1), represent the second largest element of the total costs of PO C. PO A shows lower costs than PO C, estimated at EUR 133.3 to 142.2 million relative to the baseline, expressed as present value over 2025-2050. The highest cost categories are the adjustment costs for EMSA and the adjustment costs for Member States administrations, linked to information to the public on national websites (PM5a). Finally, PO B shows the lowest total costs among the policy options, estimated at EUR 125.8 to 134.7 million in addition to the baseline costs.

In terms of benefits, all policy options are expected to lead to enforcement costs savings for Member States administrations estimated at EUR 1.8 million, expressed as present value over 2025-2050 relative to the baseline. They are driven by the reduction in the time spent for verifying CleanSeaNet alerts due to the enhancement in data exchange tools in the Integrated Maritime Services. In addition, PO B and PO C would also result in administrative costs savings (EUR 0.9 million) driven by the time savings for reporting to the European Commission under the SSP Directive due to the development of a dedicated reporting tool (PM4).

There is high uncertainty regarding the benefits of the policy options in terms of deterrence of illegal discharges to the sea, especially because of the limited data available on the illegal discharges and penalties applied. As explained in section 6.3, as an illustration of the possible impacts on net costs, a conservative assumption of a 0.5% reduction in the oil illegal discharge relative to the baseline is provided linked to the upgrades to the CleanSeaNet in PMc1 (included in all options). Under this assumption, and when also considering the enforcement costs savings and administrative costs savings, all policy options result in substantial total benefits estimated at EUR 693.2 million in both PO B and PO C, and EUR 692.3 million in PO A. A qualitative assessment of the environmental benefits of the policy measures included in the policy options is further provided in Table 13, drawing on the detailed analysis included in Table 11 in section 6.3.

Table 13. Summary of costs and benefits of policy options – present value for 2025-2050 compared to the baseline (in million EUR), in 2020 prices

	Difference to the baseline		
	PO A	PO B	PO C
Member States administrations			
Enforcement costs	2.5	2.5	205.2
Adjustment costs	12.3	0.0	0.0
Enforcement costs savings	1.8	1.8	1.8
Administrative costs savings	0.0	0.9	0.9
EMSA			
Adjustment costs	118-126.8	122.6-131.4	122.6-131.4
European Commission			
Adjustment costs	0.6	0.8	0.6
Environmental benefits			
Reduction in the external costs of oil spills due to PMc1	690.5	690.5	690.5
Reduction in the external costs due to other measures	+	++	+++
Total costs	133.3-142.2	125.8-134.7	328.3-337.2
Total benefits	692.3	693.2	693.2
Net benefits	550.2-559	558.5-567.4	356-364.8
Benefits to costs ratio	4.9-5.2	5.1-5.5	2.1-2.1

Note: A scoring system is used to compare the options with the baseline scenario in relation to the reduction in the external costs due to other measures. From "0" (no difference from the baseline) to "+++" (significant positive impact compared to the baseline).

All policy options would result in net benefits. The net benefits would be the largest in PO B, estimated at EUR 558.5 to 567.4 million relative to the baseline, expressed as present value over 2025-2050, followed by PO A (EUR 550.2 to 559 million) and PO C (EUR 356 to 364.8 million). PO B and PO A also show higher benefits to costs ratios (respectively, 5.1 to 5.5 and 4.9 to 5.2) relative to PO C (2.1). It should however be noted that the estimation of the net benefits and of the benefits to costs ratio is only provided for illustration purposes, to show that even when achieving low reductions in the level of illegal discharges the policy options would result in net benefits. This is due to the high uncertainly related to the estimated environmental benefits.

All policy options are expected to result in additional environmental benefits relative to the baseline, that could however not be assessed quantitatively. These impacts are expected to be the highest in PO C, followed by PO B and PO A, based on results of the qualitative assessment. This is expected to reduce the gap between the benefit to costs ratio of PO B and PO C. On the other hand, as the benefits are expected to be higher in PO B relative to PO A, the difference in the benefit to cost ratio between PO A and PO B is expected to be larger than shown in Table 13.

Considering the sensitivity analysis on the impacts of the policy options on external costs of oil waste, provided in section 6.3, the net benefits/net costs have been calculated for each case and are provided in Table 14. The table shows that even with lower reduction in the oil waste discharges relative to the baseline, PO B and PO A would still result in net benefits while PO C would result in net costs. On the other hand, it should be noted that not all environmental benefits were quantified and reflected in this table. Thus, PO C may still result in net benefits under all cases assessed.

Table 14. Results of the sensitivity analysis on net benefits/net costs of policy options – present value for 2025-2050 compared to the baseline (in million EUR), in 2020 prices

	Difference to the baseline		
	PO A	PO B	PO C
Net benefits (in million EUR)			

	Difference to the baseline		
	PO A	PO B	PO C
0.5% reduction (central case)	550.2-559	558.5-567.4	356-364.8
0.3% reduction	172.4-181.3	180.8-189.6	(-21.7) – (-12.9)
0.7% reduction	927.9-936.7	936.3-945.1	733.7-742.6

7.3. Coherence

Internal coherence. The internal coherence concentrates on how the different elements within the Directive itself work together to achieve the objectives. Although all three POs address the identified problem, they do so in different ways. The updated scope of the Directive, which is the case for all policy options, can be implemented with the use of additional tools by EMSA to support the increased surveillance activities that will be required. In this respect all policy options perform equally on internal coherence.

External coherence. The external coherence concentrates on the compliance of the Directive with key EU policy objectives and international agreements. The extension of the scope of the Directive brings it in line with the scope and objectives of other EU initiatives (e.g. Port Reception Facilities Directive) and international obligations derived from MARPOL. All policy options foster coherence with the Environmental Crime Directive by clarifying definitions in the context of ship-source pollution and removing the provisions of criminal penalties. With the new Environmental Crime Directive, the SSP Directive must be revised to ensure external coherence in the context of criminal penalties. In this respect all policy options perform the same.

7.4. Subsidiarity and proportionality

Under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States.

The revision of the Directive is necessary because, in the absence of further EU level action, the problem identified would most likely persist. As highlighted in section 3, there is a clear need for EU action on the problem identified, and its drivers. The EU dimension of this problem is mostly related to the cross-border nature of the illegal discharges from ships. Due to the transboundary impact of marine pollution and the fact that perpetrators act across borders, action by Member States alone would not be suited to tackle this problem. Diverging national approaches in this regard hinder an EU-wide deterrent effect preventing pollution from ships.

All policy options address the identified problem and were designed to reach all specific objectives. PO A was designed to avoid diverging approaches at national level by means of platforms for training, guidance and experience exchange as well as digital tools for collection and exchange of information. However if Member States have the flexibility in defining the components of infringements, this may still lead to diverse outcomes.

On the other hand, PO C is regarded as less proportionate because of the proposed strict regulatory approach on levels of penalties and verification obligations. Although it is likely to result in higher levels of verification this does not necessarily translate to a higher level of prosecution or follow up by means of administrative penalties. Given the fact that not all alerted possible pollution incidents can give rise to verification (in that it may not be possible to verify whether pollution has been caused, particularly at night or in bad weather) as well as the difficulties in establishing a direct and causal link between detection, verification, and the necessary follow up action (identification, prosecution and conviction) it is far from clear that PM1 will in fact lead to an increase in penalties

being imposed on polluters and on the desired deterrent effect. The majority of stakeholders are of the view that it is not proportionate to apply such strict measure given the resource implications.

Furthermore, the imposition of such a strict regulatory approach in PO C is seen disproportionate on the basis of very uncertain data and weak evaluation of the initiative (due to scarce data). A justification for this choice cannot be backed up with solid data e.g. for PM1 on the 60% verification rate. Most important in this respect is the fact that, the current limited Member State feedback to CleanSeaNet alerts does not show that a higher verification rate leads to higher levels of confirmed cases and thereafter to a higher level of administrative or judicial follow up.[132] Therefore, at this stage and on the basis of the currently available information it is difficult to justify the high cost that the Member States would need to bear without more robust information on the effectiveness of such a measure. To improve the data, the revised Directive provides for the collection of better statistics on how Member States verify CleanSeaNet alerts and how many cases are confirmed to be spills. Therefore, there will also be more information on the environmental benefits of imposing SSP penalties and an opportunity to reassess such a policy option.

To sum up, PO B is most proportionate and in line with the rules of subsidiarity. It encourages a proactive approach of the Member States placing key importance on the common measures and digital transition, without obliging the Member States to engage in costly verification activities (the results of which in terms of improvement in the enforcement statistics are unproven). The option supports tackling the problem in a proportionate way i.e. not going beyond what it necessary to achieve the objectives. The option relies on the Member States to fulfil their responsibilities effectively thanks to the technical support and capacity building offered. It also relies on their harmonised legislation and genuine, proactive cooperation between all Member States for successful penalising of polluters. Overall, PO B is expected be the most proportionate, with its synergies coming from the common framework, as opposed to individual national approaches (PO A) and strong regulatory approach (PO C).

8. PREFERRED POLICY OPTION

8.1. Identification of the preferred policy option and stakeholders views

8.1.1. Preferred policy option

Although each of the options addresses the problem identified, their drivers and the specific objectives, the three options take different approaches. An overview of the assessment of the policy options in terms of effectiveness, efficiency, coherence, subsidiarity and proportionality is provided in Table 15. Based on the assessment done, PO B is considered as the most efficient and proportionate of the policy options. On the other hand, PO C scores better than PO B and PO A on effectiveness. Concerning internal and external coherence, all three policy options perform the same.

Table 15. Overview of the assessment of policy options relative to the baseline

	PO A	PO B	PO C	Comments
Effectiveness	+	++	+++	PO C is considered to have a higher deterrent effect due to an obligatory verification rate.
Efficiency	++	+++	+	PO B shows the highest benefits to costs ratio. It should however be noted that there

[132] See Figure 19 in Annex 4.

				is high uncertainty related to the environmental benefits, and not all of them were possible to quantify. The environmental benefits might be higher.
Coherence	+++	+++	+++	All policy options are coherent with key EU legislation, with international agreements and within the Directive.
Subsidiarity and proportionality	++	+++	++	PO B encourages a proactive approach of the Member States placing key importance on the common measures and digital transition.

Note: A scoring system is used to compare the options with the baseline scenario. From "0" (no difference from the baseline) to "+++" (significant positive impact compared to the baseline).

The Directive is part of a broader framework of measures aiming to tackle together the identified problem of ship-source pollution in European waters. The maritime safety acquis is based on the rules and standards established by the IMO at the international level. More specifically, the accelerated phasing-in of double-hull tankers (Regulation (EU) No 530/2012) reduced the probability of accidental oil spills in European seas. The flag State Directive (Directive 2009/21/EC) provides rules for ship inspections and fleet oversight for Union flag State administrations which is relevant for preventing pollution of the marine environment in and outside of the Union. When stronger environmental rules become effective under the international conventions, the flag State responsibility to enforce them is automatically extended. The port State control Directive (2009/16/EC) is also relevant in this context because it supports the detection and correction of lack of compliance not only with safety but also with pollution prevention rules and standards, through inspections. Maritime accidents do not only cause casualties and economic losses but can have a direct impact on the environment e.g. oil pollution. Lessons learned from accident investigations (Directive 2009/18/EC) may prevent accidental pollution of the marine environment in the future. Last but not least, the Port Reception Facilities Directive (Directive 2019/EC/883) provides the solution for waste collection in ports and is a key part of the broader framework of measures aiming to tackle the ship-source pollution problem. Thus, this initiative should be seen in the broader context of the framework of measures aiming to tackle together the identified problem of ship-source pollution in European waters.

PO B is the preferred option because it is expected to be the most cost efficient and proportionate option. In terms of efficiency, the benefit to cost ratio is estimated to the be highest in PO B (5.1-5.5), with net benefits estimated at EUR 558.5 to 567.4 million relative to the baseline, expressed as present value over 2025-2050. Furthermore, PO B shows the lowest total costs among the policy options, estimated at EUR 125.8 to 134.7 million in addition to the baseline costs. In terms of subsidiarity and proportionality, PO B relies most on Member States being proactive and fulfilling their responsibilities effectively thanks to the technical support and capacity building offered. It is assessed to be the most proportionate thanks to a harmonised framework, exchange of information and cooperation between all Member States for successful penalising of polluters.

It should be noted that there is high uncertainty related to the estimated environmental benefits due to the illegal discharges prevented. The environmental benefits might be higher, especially due to the increased scope. Nevertheless, PO B is still expected to result in net benefits even when lower environmental benefits are considered.

The following legal and non-legal instruments may be needed for the implementation of the preferred option:

- legal instruments: implementing act(s) e.g. on the criteria for levels of administrative penalties and on reporting requirements and their format/modalities;

- non-legal instruments: EMSA guidance documents on detection and evidence collection for ship-source pollution under the extended scope of the Directive, guidelines produced by Commission based on the work of the expert group, CleanSeaNet digital tool, online portal with key non-confidential information on ship-source pollution.

8.1.2. Overview of stakeholders' opinions

Stakeholders largely agreed that pollution prevention was still an issue and improvements were needed in this area, particularly by making the Directive more effective. Most stakeholders considered the information systems provided by EMSA had improved pollution detection, although there was in this respect margin to improve their effectiveness. However, the consultation activities suffered from the absence of data both on cost and benefits, but also on the enforcement activities.

The main difference between stakeholders' groups could be found between NGOs and the industry, the former strongly support to extend the scope of the Directive, including even beyond MARPOL, while the industry contested the rationale for the extension and requested to align the liability regime with MARPOL, i.e. remove the serious negligence provision.

Member States authorities were concerned with the administrative burden while supporting measures to improve exchange of information and cooperation assisted by EMSA.

In relation to the measures proposed, those common to the 3 policy options received a positive opinion from stakeholders, namely the extension of the scope of the Directive (PMc1), EMSA training and guidance (PMc2), the setting of an expert group (PMc3) and the enhancement of Integrated Maritime Services (PMc5).

For some measures, stakeholders considered they lacked sufficient knowledge to have an opinion. This was the case of gathering information from whistle-blowers (PMc4), clarifications on the liability regime (PMc6) and on the type of penalties (PM2 a & b). In the relation to the obligation to register if and how CleanSeaNet alerts had been verified (PMc7), stakeholders' support was low.

The specific measures included in PO A faced stakeholder opposition: five out of the twelve MS authorities consulted expressed their disagreement with the request for MS to inform the public about ship-source pollution incidents through a national website (PM5a), as they believe it would be enough to provide the information through the reporting portal DONA; they considered this measure would not have a significant impact to the objectives of the SSP Directive.

The specific measures included in PO B: setting criteria for the level of penalties (PM3a), the obligation for Member States to report their data in an EMSA-managed tool on each ship-source pollution incident (PM4) and the publication online by EMSA of key EU information reported by Member States about ship-source pollution incidents (PM5b), encountered low to medium stakeholder support, but no opposition.

The specific measures included in PO C encountered on the one hand opposition, as for the mandatory verification of 60% of CleanSeaNet alerts (PM1), which Member States argued would require significant additional resources, whereas low to medium stakeholder support with no opposition was shown for the measure defining both criteria and maximum and minimum values for penalties (PM3b) or for the obligation for Member States to report their data in an EMSA-managed tool on each ship-source pollution incident (PM4).

To sum up in relation to the preferred policy option (PO B), most of the measures envisaged under this option are in principle supported by stakeholders that responded to the consultation activities. During a stakeholder workshop on 22 September 2022, when asked about the three options, 20 out

of 27 voting participants selected strengthened Member State cooperation and EMSA support. However, there are also divergent opinions among stakeholders. Some industry stakeholders are of the opinion that the Directive is not needed at all as international MARPOL rules are sufficient. Four responses to the public consultation from the industry (out of 6) indicate that they consider that the same result in terms of enforcement could have been achieved largely without the Directive, through international rules. However, this was not a prevailing view. Stakeholders are in favour of having EU support for increasing the capacity of Member States and see the need for an EU initiative to support transparency, prioritisation and harmonisation in the area of ship-source pollution. In this context, it should also be noted that the transposition of MARPOL rules into the EU legal system makes these provisions actionable before the European Court of Justice.

Detailed information on the stakeholder consultation is included in Annex 2

8.2. REFIT (simplification and improved efficiency)

The revision has a REFIT dimension in terms of alignment and simplification. Better aligning the scope with MARPOL brings the benefits of fully incorporating into the Directive penalties for a broader range of polluting substances under a harmonised approach towards infringements. Simplification aspects include enhancing the existing and developing new modern digital tool for data collection and exchange on ship-source pollution and further develop the relevant automated links in the Integrated Maritime Services. This will improve the use of interoperable digital solutions and make the Directive digital-ready as well as provide opportunities to avoid duplication of reporting at international level (IMO Global Integrated Shipping Information System) and regional level (Regional Sea Agreements).

Member States will face higher costs due to the scope extension as they will receive more CleanSeaNet alerts (coupled with a new requirement to log feedback data) but this has to be seen against the simplification brought about by the new digital tools. The enforcement cost savings for Member States authorities are estimated at EUR 1.8 million[133], while the administrative cost savings at EUR 0.9 million[134], expressed as present value over 2025-2050 relative to the baseline (in 2020 prices).

PO B leaves a considerable margin of discretion to Member States, specifically on carrying out their duty of verifying possible spills as to identify the offender. The decision on whether or not to verify a CleanSeaNet alert is left to the Member States and all relevant and available information will be provided to the Member State to support this decision.

In addition, the preferred policy option includes the following elements of simplification:

- The provisions of assistance to national authorities with training, guidance and a dedicated expert group to support capacity building and cooperation between Member States will improve the operational effectiveness of their surveillance and enforcement tools and resources, as well as the efficient use of such resources.

[133] Driven by the reduction in the time spent for verifying CleanSeaNet alerts due to the enhancement in data exchange tools in the Integrated Maritime Services.

[134] Driven by the time savings for reporting to the European Commission under the SSP Directive due to the development of a dedicated reporting tool.

- It will clarify the liability regime i.e. the exception from liability which will improve the understanding of the EU liability regime.
- The EMSA assistance to Member States in the form of analytical tools and hi-tech solutions will increase harmonisation and standardisation across the EU in the context of ship-source pollution.

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

As explained in section 6.1.2, the preferred policy option is not expected to result in additional administrative costs or adjustments costs for the private sector, or for the citizens. More penalties may be expected for ships not meeting MARPOL requirements. The level playing field should bring benefits for the compliant ship operators. In addition, both citizens and business would benefit from the reduction in the ship-source pollution with the benefits expected to be larger for citizens.

9. HOW WILL ACTUAL IMPACTS BE MONITORED AND EVALUATED?

The success of the Directive is the effective response of the Member States. It would ultimately mean that the person (legal or natural) responsible for the pollution of the sea is adequately penalised to produce a deterrent effect and this way prevent pollution in the future. SSP penalties can be seen as the end result and last line of defence for pollution prevention and the protection of marine environment.

The Commission services will monitor the implementation and effectiveness of this initiative through a number of actions and a set of core indicators that will measure progress towards achieving the specific objectives. Five years after transposition of the legislation, the Commission services should carry out an evaluation to verify to what extent the objectives of the initiative have been reached.

Table 16. Summary of how impacts will be monitored

Specific objective	Indicator
SO1: Incorporate international standards into EU law by aligning the Directive with MARPOL Annexes on discharges into sea	Number of: - infringements - detections for oil, noxious substances, packaged goods, sewage, garbage and scrubber discharge water discharged by ships
SO2: Support Member States by building their capacity to detect pollution events, verify, collect evidence and effectively penalise identified offenders in a timely and harmonised manner	Number of: - verifications per Member State (verification level) - identified offenders as a result of verification (identified polluters) - notifications by whistle-blowers - EMSA training workshops
SO3: Ensure that persons (natural & legal) responsible for illegal discharges from ships are subject to effective, proportionate & dissuasive sanctions	- levels of monetary fines imposed - types of penalties imposed
SO4: Ensure simplification and effective reporting on ship-source pollution events and follow-up activities	Number of: - updates per Member State in reporting platform - ship discharges recorded in the reporting platform per Member State - views/visits at the public website

Actions foreseen for verifying implementation include:

- Commission/EMSA verifying that feedback to CleanSeaNet alerts is being provided by the Member States in a timely and effective manner and that information on evidence collection and prosecution is uploaded to the reporting tool regularly.

- Commission/EMSA develops an EU website with core indicators on the implementation rate and the key non-confidential information updated regularly with data from the reporting tool to keep the public informed on the implementation and on pollution incidents.

- Visits to Member States to verify operations on the ground, carried out by EMSA on behalf of the Commission, as part of EMSA's support role to the Commission. These visits will be integrated, where possible, with the visits targeting Port Reception Facilities and should be summarised in visits reports identifying shortcomings in a coherent manner.[135]

    - Upon request, horizontal analysis and technical assistance to be provided by EMSA[136] (indicating how the legislation is functioning and identifying gaps and solutions thereof) and to be reported to the Commission and Member States.

[135] EMSA carries out such visits under Article 3 of Regulation (EC) No 1406/2002 establishing a European Maritime Safety Agency as part of its core tasks. As such, no additional costs are expected to incur.

[136] Article 3(5) Regulation (EC) No 1406/2002 establishing a European Maritime Safety Agency

Annex 1 - Procedural information

Lead DG, Decide Planning/CWP references

The lead DG is Directorate General for Mobility and Transport (MOVE), Unit D2: Maritime Safety

DECIDE reference number: PLAN/2019/5432

This initiative was announced under item Action 14 in Action Plan to the Sustainable and Smart Mobility Strategy.

Organisation and timing

The impact assessment and the ex-post evaluation of the Ship-Source Pollution Directive were performed in a back-to-back manner (i.e. the evaluation and impact assessment have been launched at the same time) in 2021-2022.

The impact assessment and evaluation started in 2021, with a combined evaluation roadmap/ inception impact assessment published on 19 May 2021[137].

The impact assessment on a possible review of the Ship-Source Pollution Directive and the ex-post evaluation were coordinated by an Inter-Service Steering Group (ISG). The Commission Services participating in the ISG were: Secretariat-General, Legal Service, DG Environment, DG Climate Action, DG for Justice and Consumers, DG Maritime Affairs and Fisheries, DG for European Civil Protection and Humanitarian Aid Operations, the European External Action Service and the European Maritime Safety Agency (EMSA).

The Inter-Service Steering Group met 6 times: on 12 March 2021, 10 November 2021, 29 April 2022 and 21 June 2022, 14 September 2022 and 27 October 2022. It was consulted throughout the different steps of the evaluation and impact assessment process: notably on stakeholder consultation questionnaire and deliverables and on the draft Staff Working Documents. When necessary bilateral discussions were organised with the concerned services.

The revised draft Staff Working Documents, following the first opinion of the RSB, were consulted with the group during 17-28 February 2023 and comments from DG ENV and EMSA were received and taken into consideration when possible.

Consultation of the RSB

The draft impact assessment and evaluation reports were submitted to the RSB on 3 November 2022. They were discussed by the Board on 30 November 2022. Following a negative opinion of the RSB on 1 December 2022, a revised version of the two reports was submitted to the Board on 3 March 2023.

The table below presents an overview of the RSB's comments and how these have been addressed.

[137] European Commission (2021) Combined Evaluation Roadmap/Inception Impact Assessment. Revision of the Directive on ship-source pollution

RSB Comment – first opinion	How the comment has been addressed
1) The report should draw more on the evaluation findings to: (i) critically discuss how effective the SPP has been in reaching its objectives, (ii) explain what the key problems are, (iii) state which of those this initiative aims to tackle, and (iv) how they interact with each other (e.g. overall problem of ship source pollution versus specific implementation, enforcement and capacity problems). It should provide a clearer idea of the scale of these problems and the underlying problem drivers. On this basis, it should define more precisely its specific objectives, including by explaining upfront what the initiative aims to achieve over and above the MARPOL Convention and by indicating what success would look like. It should then identify the sets of measures that can effectively deliver on the objectives, thereby presenting a clearer intervention logic and overall revised narrative. Being clear on the expected level of ambition and on what success would look like, would help to manage expectations of this initiative.	a) More information on the effectiveness of the Directive, the problem definition and problem drivers has been added in sections 2.1 and 2.2 of the revised report, drawing also on the evaluation report. b) The specific objectives were reworded in section 4.2 (in particular specific objective 2 on supporting the Member States in their enforcement) and the narrative revised accordingly throughout the report. c) The context was reinforced in sections 1, 3.3 and 5.2 by clarifying what the proposal achieves over and above MARPOL (i.e. EU liability regime, satellite surveillance, types and levels of penalties). d) To clarify the expected level of ambition and what success would look like, sections 1, 2.1, 3.3, 4.2 were revised. Success is defined as an increased proportion of illegal discharges from ships subject to penalties.
2) The report should present a credible and dynamic baseline. It should include the effects of existing and upcoming relevant legislation, ongoing technological developments, recent geo-political events and insights from foresight. It should be clear how verification and prosecution costs associated with complying with the MARPOL Convention are reflected in the modelling.	a) Section 5.1 has been revised. It better explains that all possible efforts have been made to build a dynamic baseline. It also further explains how relevant legislation, technology etc. influences the baseline. b) Section 1, 3.2, 5.1 and 5.2 have been improved to better explain that costs of verification and prosecution of the incidents are not considered as costs of the SSP Directive (i.e. there were verification and prosecution costs prior to the adoption of the Directive and costs accounted for in this report do not create a duplication with costs occurring under MARPOL implementation).
3) The report should better explain the rationale behind the option design. It should present alternative sets of measures that can effectively tackle the problems. It should better justify why the policy measure on	a) Section 5.2 has been improved to better explain the design of the three policy options and how the proposed measures can tackle the problem in three ways/ options (national enforcement focus,

RSB Comment – first opinion	How the comment has been addressed
further data integration and exchanges does not feature in the set of common policy measures. It should clarify whether a slightly different option design would affect outcomes, and if yes, how this has been reflected in the analysis.	cooperation focus, EU harmonisation focus). b) The policy measure on the enhanced Integrated Maritime Services is now included in the set of common policy measures. This required adapting the numbering of the policy measures and the estimation of the costs and benefits. The description of policy options in section 5.2 was also revised.
4) The report should reflect the significant data limitations in assessing effectiveness, efficiency and EU added value, both in the evaluation conclusions and in the assessment and comparison of the options.	The evaluation and impact assessment reports were adapted to reflect the significant data limitations in particular, the description of the context in section 1 and 7 as well as in the conclusions of the evaluation.
5) The report should improve the analysis of the environmental impacts. The report should more clearly explain (and quantify to the extent possible) the environmental benefits of all measures. If further quantification is not possible, the report should provide a much more developed qualitative assessment of the environmental benefits, fully informed by the views of different stakeholder groups and independent expert judgement. This revised effectiveness assessment of the options in delivering the environmental benefits should then be reflected in the revised comparison of costs and benefits.	a) A qualitative assessment of the environmental impacts of all policy measures, by policy option, has been added in section 6.3. b) A summary of the views of different stakeholder groups has been added in Annex 2 for all proposed measures and in the main text of the report in footnotes. c) The comparison of costs and benefits in section 7 has been improved based on the above.
6) Options should be compared against the dynamic baseline scenario. The report should include a comparative table that ranks effectiveness, efficiency and coherence for each of policy options. The comparison of options should include the results of any additional analysis of the environmental benefits. Where adequate quantitative estimates are missing, a qualitative scoring should be done.	A comparative table that ranks effectiveness, efficiency, coherence, subsidiarity and proportionality was added in section 8.1. The qualitative assessment of the environmental benefits has also been reflected in the comparison of options.
7) The report should better justify the choice of the preferred option. The current analysis shows that the preferred option does not have the best Benefit Cost Ratio. However, the effectiveness and efficiency analysis does not adequately reflect the likely different environmental impact of each option. For the	Section 8.1 has been improved to better explain the choice of the preferred option. By including the policy measure on the enhanced Integrated Maritime Services in the set of common policy measures, the preferred policy option shows now the best benefit to cost ratio. The environmental impacts have

RSB Comment – first opinion	How the comment has been addressed
report to conclude on the preferred option, the justification should provide the key elements leading to this conclusion, acknowledge the limitation of the analysis and the fact that the choice of the preferred option is sensitive, even to small changes in policy options' design. In the absence of clear evidence on some proposed measures' effectiveness, in particular with respect to the scale of environmental impacts, the report should demonstrate why the preferred option is expected to deliver the expected positive results.	been better reflected in the effectiveness and efficiency assessment. Better justification of the choice in this section is based on the comparative table that ranks effectiveness, efficiency, coherence and subsidiarity/ proportionality. The description of the environmental impacts of each option was improved, by adding an assessment of the impacts by policy measure and by option.
8) Stakeholder and independent expert views and arguments should be presented more prominently and systematically throughout the main report. Notable disagreements between different categories of stakeholders on option design and the impact of some measures should be highlighted. In this regard, Annex II should be structured, summarised and feed into the main report.	More details are provided on stakeholders' views based on the consultation process. There were no notable disagreements between different categories of stakeholders on option design and the proposed measures.

RSB Comment – second opinion	How the comment has been addressed
(1) The report should summarise, upfront, the main problems, and the main aim of the revision in order to frame the overall narrative and intervention logic early in the analysis. It should explain clearly what its level of ambition is so that the effectiveness of the options on delivering on this ambition and tackling the problem can be clearly assessed.	A summary of the problem tackled by the Directive, the aim and the level of ambition of the initiative has been added in section 1 of the revised report. The remaining sections were revised punctually to link with this change.
(2) The discussion on the choice of the preferred option should make clear that this initiative is part of a broader framework of measures aiming to tackle the problem of ship source pollution in EU waters in working together. The report should explain whether the expected contribution of 0.5% reduction of oil waste discharge under the preferred option is in line with the envisaged ambition of the initiative.	Section 8.1 has been revised to explain that a number of initiatives address together the problem of ship-source pollution in European waters. The reduction in the level of oil discharges is only indirectly linked to the envisaged ambition of the initiative. Section 6.3 was revised to better explain this, and the limitations of the quantitative data to estimate the impacts on Annex II-VI pollutants.

Evidence, sources and quality

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

- Stakeholder consultation activities (see Annex 2);
- External support studies carried out by an independent consortium (lead by Ricardo). The external support studies will be published alongside this report.
- Commission experience in monitoring and implementing the Directive;
- Reports and information sourced by databases managed by EMSA.

The baseline scenario builds on the EU Reference scenario 2020 developed by E3Modelling with the PRIMES-TREMOVE transport model but also reflects the 'Fit for 55' package. This report also draws on the activities of the European Sustainable Shipping Forum, Waste from Ships subgroup, a temporary Commission's expert groups with Member States representation and industry stakeholders, which was established for the purpose of the revision of the Port Reception Facilities and SSP Directives.

Annex 2 - Stakeholder consultation

This annex provides a summary of the outcomes of the consultation activities, which have been carried out for the evaluation and Impact Assessment of the Ship-Source Pollution Directive, including in the context of the external support study. The impact assessment and the ex-post evaluation of the Ship-Source Pollution Directive were performed in a back-to-back manner (i.e. the evaluation and impact assessment have been launched at the same time) in 2021-2022.

This annex provides the range of stakeholders consulted, describes the main consultation activities and also provides a succinct analysis of their views and the main issues they raised.

The aim of the consultation activities was to collect information and opinions from stakeholders on the achievements of the Directive, its added-value, key problems and associated drivers, definition of relevant policy objectives linked to those problem areas and the identification, definition and screening of policy measures that could eventually be incorporated into policy options for the Impact Assessment, as well as gather information and opinions on their likely impacts.

1. Overview of consultation activities

A consultation strategy, covering all stakeholder consultation activities, including those carried out as part of the support study, was developed early in the process. The consultation activities were aimed at a range of stakeholders dealing with the identification, verification and prosecution of ship-source pollution in EU and industry representatives (including relevant associations of ship-owners and port operators), as well as non-EU players (e.g. flag States). The objective of the consultation activities was to collect information and opinions on the current implementation and enforcement of rules on illegal discharges from ships as well as gather evidence on expected costs and benefits of draft policy measures.

Consultation activities have taken place since the publication of the combined evaluation roadmap/ inception impact assessment published in May 2021 and continued until the stakeholder validation workshop in September 2022.

As part of the initial feedback mechanism, stakeholders had the opportunity to provide feedback on the combined evaluation roadmap/ inception impact assessment[138] via the relevant website. The Commission received eight responses, during June 2021. Six responses were provided by NGOs and two by business representatives.

Afterwards, the following consultation activities were carried out:

– An Open Public Consultation (OPC), organised by the European Commission, which ran from 9 December 2021 to 3 March 2021. The OPC put forward questions on both the Impact Assessment and the evaluation of this Directive.

– Three rounds of interviews with EU level representatives of key stakeholders organised by the consultant in charge of the external support study, running intermittently from

[138] European Commission (2021) Combined Evaluation Roadmap/Inception Impact Assessment. Revision of the Directive on ship-source pollution

November 2021 to September 2022, to fill specific information requests, in support of the evaluation and to refine the overall problem definition and possible policy options.

– Two targeted stakeholder surveys to gather specific information, one for the evaluation and one for the Impact Assessment, organised by the consultant in charge of the external support study, running, respectively, from December 2021 until February 2022 and June until July 2022.

– Additional targeted consultation activities organised by DG MOVE in order to consult the Member States and key stakeholders on the different policy measures and to validate the emerging and final results of the support study to the Impact Assessment in terms of the quantification of impacts. These activities took place in the context of a meeting of the EU Committee on Safe Seas and the Prevention of Pollution from Ships (2 June 2022), meetings of the European Sustainable Shipping Forum (18 May 2022) and its subgroup: Waste from Ships (22 March 2022 and 4 June 2022), the EU/EEA Maritime Transport Directors (3 October 2022), the North Sea Network of Investigators and Prosecutors (25 April 2022), HELCOM (8 June 2022) and BONN Agreement meetings (21 September 2022), an informal meeting with the Regional Sea Conventions (29 June 2022) and an informal meeting with ECSA (21 September 2022). A final workshop to validate the conclusions of the support study attended by Member State, NGOs and industry representatives was also organised (22 September 2022).

The information collected from stakeholders was key in allowing the Commission to evaluate the Directive, define the policy options and assess and compare their economic, social and environmental impacts. As result, the consultations informed on which policy option is likely to maximize the benefits/costs ratio for the society and achieve a more effective and efficient mechanism to discourage ship-source pollution in the EU. Findings from those processes complemented the desk research carried out in the context of the external support study.

Methods have been adapted to take account of the development of the COVID-19 pandemic. For this reason, interviews and meetings were held by videoconference.

Table 17. Overview of responses to different stakeholder consultation activities

	Number of invitees	Number of responses	Topics covered
Open public consultation	Open	30	Implementation of the Directive – successes and problems
Exploratory interviews	9	6	Problem assessment
Targeted Evaluation interviews	42	31	Implementation of the Directive – successes and problems
Targeted Impact Assessment interviews	50	26	Policy measures / options / impacts
Targeted Evaluation survey	58	25	Implementation of the Directive – successes and problems
Targeted Impact Assessment survey	53	3	Policy measures / options / impacts
Stakeholder workshop	Open	86	Policy measures / options / impacts

The full list of stakeholders who participated in the various consultation activities is included in the external support study. There were no campaigns[139] identified in the responses neither

[139] 'Campaign' – e.g. NGO based in a Member State may call on members to respond in the same way to a consultation for all questions.

to the targeted nor the public consultation. The information and views received in the context of the public consultation were taken into consideration for the elaboration of the Evaluation and Impact Assessment report, but they cannot be regarded as the official opinion of the Commission and its services (and thus does not bind the Commission) and the contributions cannot be considered as a representative sample of the EU population.

2. Limitations of the Stakeholder consultation

Stakeholders were not very responsive to the various consultation activities. There were only **30 responses** to the open public consultation and the input to each of the remaining consultation activities did not exceed 31 participants. Often the responses were delayed or answers were incomplete. The most attended consultation activity was a 1-day online stakeholder workshop organised at the time of the draft final report to discuss preliminary findings of the evaluation and Impact Assessment of the SSPD with 86 participants. Invitations for the workshop were targeted at experts from all relevant stakeholder groups. Since all relevant stakeholder groups have provided their views and positions to the various consultations, a comparison and analysis of opinions gathered from all consultation activities was possible. Nevertheless, it was difficult to identify trends from the feedback in the consultation due to the low response rate.

It was particularly difficult to gather input from stakeholders on possible expected **costs and benefits** of implementing the proposed measures, as well as estimations on the **number of prosecutions** because of the scarcity and incompleteness of existing data.

The data available from the interviews and surveys on the evaluation and Impact Assessment was not sufficiently robust to make a complete analysis for all Member States. In certain instances, the responses of the Member States were not very consistent. The level and quality of evidence gathered varies. For some evaluation criteria, in particular relevance and coherence, the evidence gathered was satisfactory. Availability and quality of data was a challenge affecting in particular the assessment of the effectiveness and efficiency criteria.

Where quantitative data was available, it was used to make estimations and was complemented by stakeholder opinions and positions. Whenever possible, information gathered from different sources, including input from stakeholders were compared and triangulated. Where available data and literature was limited, consultation responses were relied upon to answer the evaluation questions and are indicated throughout this report.

3. Analysis of the key results of the stakeholder consultation

The remainder of this annex presents key findings from the analysis of stakeholder contributions to the consultation process. They are structured around the main elements of the intervention logic, including the problem areas and their drivers, the policy objectives as well as the key aspects of the design of possible policy measures. The technical support study for this evaluation and Impact Assessment contains the detailed presentation of findings from the targeted consultation activities. Furthermore, the factual summary of public consultation contains concise information in the form of graphs and figures.

3.1. Current scope and implementation

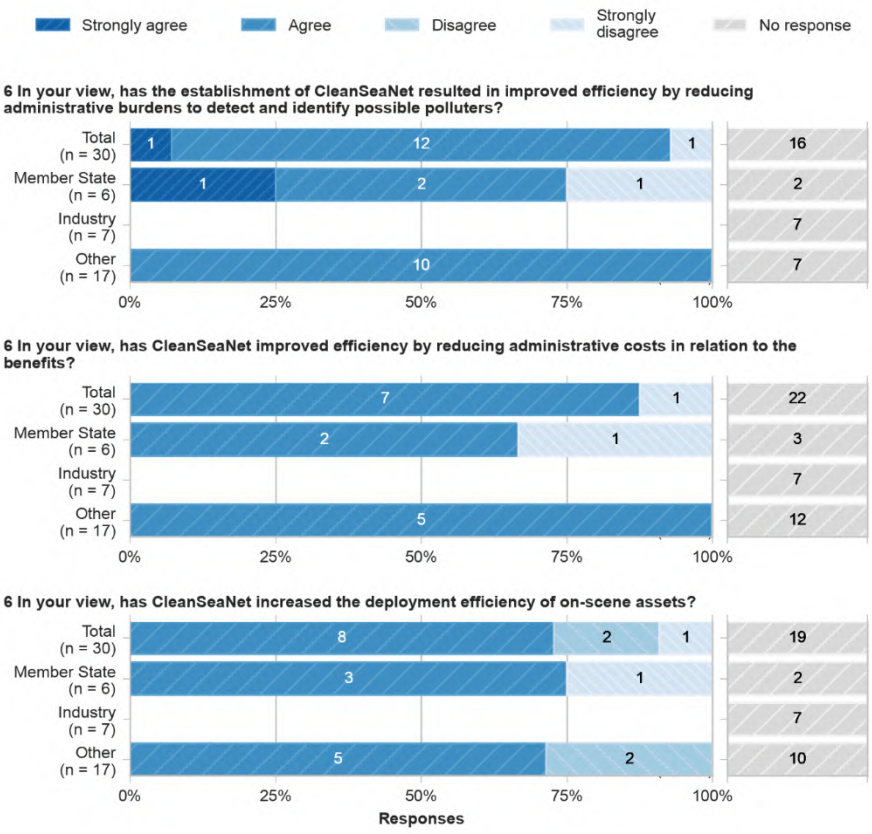
– Need for improved maritime transport safety and ship-source pollution prevention (protection of the marine environment)

Stakeholders consulted for the evaluation largely agreed that this issue is still relevant, supported by 24 (out of 31) stakeholders interviewed and 23 (out of 25) responses to the evaluation survey. It was acknowledged by stakeholders interviewed, including Member State authorities, international bodies and the maritime industry, that whilst shipping is considerably safer than prior to the Directive and there are fewer oil spill incidents partially due to improvements in safety, technology and training standards, ship-source pollution is still occurring, and additional improvements are still required. In this respect, 18 respondents (out of 30) to the public consultation stated that they do not find the Directive effective in terms of protecting the marine environment from illegal discharges from ships.

- *Surveillance and monitoring*

Generally, stakeholders are of the opinion that EMSA systems and information exchange between Member States have improved pollution detection in the EU over the years. Ten Member State authorities interviewed (out of 14) agreed that the CleanSeaNet service has increased the efficiency of the implementation of the Directive. Out of the 28 replies on the question on surveillance in the public consultation, 13 viewed CleanSeaNet as an efficient tool (the other half responded 'I don't know' including all industry representatives). More public input on CleanSeaNet is shown in the figure below.

Figure 8. Open public consultation on CleanSeaNet and efficiency



On the other hand, discharges are not always detected on time. Eleven Member State respondents to the evaluation survey (out of 19) stated that their authorities are not using EMSA tools (e.g. CleanSeaNet alerts) to their full extent. Only eight of the authorities interviewed (out of 19 Member States) agreed that EMSA tools are used effectively in their country.

- Cooperation between Member States, information exchange and enforcement

There is consensus among Member State authorities interviewed that cooperation and information exchange activities led to improved capacity towards detection of illegal discharges. Also, seven industry responses to the public consultation (out of 13) indicated that the Directive has contributed to some extent to increased cross-border cooperation between Member States law enforcement and judicial authorities. Moreover, cross-border cooperation between Member States was perceived by the participants of the stakeholder workshop as the largest benefit of the current Directive, as shown in the figure below.

Figure 9. Stakeholder views from the stakeholder workshop on benefits of the Directive

The main issues hindering the detection of illegal discharges and identification of polluter, as identified by stakeholders consulted, are listed below:

– insufficient resources or unavailability of aerial means for oil spill detection;

– limitations to provide near real-time identification;

– limited resources (e.g. patrol ships) for sample collection, especially in areas distant from the coast;

– heavy ship traffic areas and short duration of operation discharges; and

– technical challenges due to the size of the area covered (particularly for EEZ and high seas).

There is a difference in opinion between the industry and the remaining stakeholders on enforcement. Four responses to the public consultation from the industry (out of 6) indicate that they consider that the same results of enforcement could have been achieved largely without the Directive and through international legislation. In the stakeholder workshop, only 11 participants voting (out of 51) indicated that MARPOL is enough and the Directive is not needed. Industry and 'other stakeholders to the OPC' largely agree that the same result would not have been reached without the Directive (8 indicated 'not at all' and 8 'to a small extent, out 16 responses).

– Discrepancies in penalties related to ship-source pollution among EU Member States

The majority of the stakeholders interviewed (including Member State authorities, the maritime industry and regional/international bodies) agreed that penalties are not harmonised in the EU. Thirteen respondents to the survey (out of 25) agreed that discrepancies in penalties for infringements related to ship-source pollution among EU Member States have an uneven dissuasive effect. This effect was also confirmed by five Member State authorities and three stakeholders from the maritime industry interviewed. In response to these inconsistencies, stakeholders see the need for more harmonisation.

– Effectiveness, proportionality and dissuasiveness of penalty procedures

There are contradicting opinions on whether the intervention was successful to achieve its objective to ensure that persons responsible for discharges of polluting substances are subject to effective, proportionate and dissuasive penalties. Eight Member State authorities interviewed (out of 16) considered criminal penalties proportionate and dissuasive as a measure. Similar results were provided to the evaluation survey, where eleven stakeholders responding agreed with criminal penalties were proportional and dissuasive (out of 25). Still, one Member State authority stated that criminal procedures are usually impractical and rarely produce the desired outcome. Other stakeholders, who provided input to the interviews and/or the survey, including industry, workers' representatives and NGOs, suggested that criminal penalties are not considered proportionate in any case and have no dissuasive effect in preventing cases of ship-source pollution. The industry representatives made this point also during the stakeholder workshop. Regarding penalties, including criminal penalties, as an effective way to ensure compliance with international standards for ship-source pollution, 19 respondents to the public consultation (out of 28) agreed that penalties are an effective way to ensure compliance. Contradictory, only two stakeholders (out of 30 who responded to the public consultation) indicated that the introduction of penalties in national legislation led to operators taking measures to comply with legislation to protect the marine environment. Based on the results of the consultation it is not possible to conclude whether penalties are effective, proportionate and dissuasive, or not.

– Costs of the current Directive

Stakeholders were asked whether they considered that, the Directive and the associated changes to the national legislation have led to an increase in the time and costs associated with maritime pollution surveillance and enforcement activities. Eight Member State authorities (out of 14) interviewed indicated that there is no change associated with these costs. Six Member State authorities (out of 25 responses to the evaluation survey) indicated a slight increase in the costs associated with maritime pollution surveillance and enforcement activities. Two interviewed Member States indicated that the implementation of the Directive through national legislation did not require any additional cost as provisions (or most of them) were already in place before the implementation of the Directive in their country. Three Member State authorities (out of 25 responses to the survey) indicated that there has been a significant increase and pointed to the costs of on-site verification of CleanSeaNet alerts linked to the increase in the frequency of verification activities.

Ten Member State authorities interviewed (out of 14) agreed that CleanSeaNet service has increased the efficiency of the process; four of which indicated that this has not led to a reduction in costs because of increased frequency of verification activities. Seven of the respondents to the public consultation (out of 30) agreed that the establishment of CleanSeaNet service has resulted in improved efficiency by reducing administrative burden.

3.2. Problem areas and policy objectives

This section provides an overall view of stakeholder's inputs on the proposed definition of problem, its underlying drivers, and on the objectives of the policy intervention under consideration.

– Problem definition: ships illegally discharging polluting substances to the sea rarely face effective and dissuasive penalties

Seventeen of the stakeholders interviewed (out of 26) agreed with the overall definition of the problem[140] that ships rarely face adequate penalties. Two Member State authorities disagreed with the identified problem. These authorities indicated that, for MARPOL Annexes I and II, the implemented regimes have been sufficient and effective so far.

The representatives of the maritime industry, ECSA and ICS, disagreed with the identified problem, referring to no evidence available on an increase in ship-source pollution in EU waters in the recent years. This has been reemphasized by them in the interviews and in the stakeholder workshop. They stated that there is effective international legislation in place to prevent and control illegal pollution from ships. The MARPOL Convention, as per their statement, allows parties to establish sanctions "of adequate severity" (Article 4 of MARPOL) to discourage violations of the Convention, and draws a fundamental distinction between accidental and deliberate pollution. ECSA and ICS also pointed to UNCLOS (Art. 230) with regards to supporting MARPOL in the context of monetary penalties as the most common sanction for pollution in areas beyond the territorial seas. IPTA (International Parcel Tankers Association) also disagreed with the identified problem, as they consider it to be unlikely for ships to illegally discharge polluting substances into EU seas noting that effective and dissuasive penalties are already in place, as well as the risk of reputational damage for a shipping company as a result of a ship-source pollution incident, which is likely to have a preventive effect.

In brief, industry disagrees with the problem definition but most of the remaining stakeholders agree that ships illegally discharging pollutants at sea rarely face effective and dissuasive penalties.

– PD1: *The Directive's scope, which is limited to Annexes I-II of the MARPOL Convention, does not cover all relevant polluting substances.*

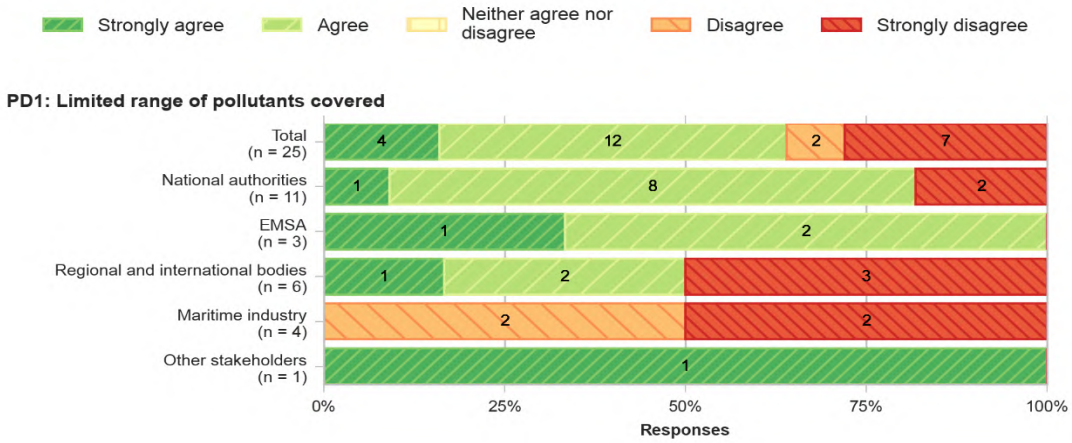
Sixteen stakeholders interviewed (out of 26) agreed or strongly agreed with problem driver 1 on the limited range of pollutants covered[141]. On the other hand, 9 stakeholders disagreed or strongly disagreed with the fact that the limited range of pollutants covered is a problem driver[142].

Figure 10. Stakeholder views from the IA interviews on PD1: Limited range of pollutants covered

[140] This includes eight out of 12 of the MS authorities interviewed.

[141] Stakeholders that agreed or strongly agreed include nine MS authorities, three European Commission bodies, three regional/international organisations and one environmental NGO.

[142] These include two MS authorities, three regional/international organisations and four maritime industry stakeholders.



Furthermore, 23 out 28 respondents to the OPC selected the option 'Update the Directive to include amendments to the MARPOL Convention putting in place stricter rules for discharges of waste from ships at sea' as a relevant aspect that should be addressed by a revised Directive.

On the other hand, maritime industry stakeholders – such as ECSA, ICS or BIMCO – disagreed, as, according to them, all relevant polluting substances are already covered under the MARPOL Convention. Therefore, expanding the range may have a limited effect in terms of polluting substances that are subject to penalties if illegally discharged into EU waters. Also, they pointed to the difficulties of the practical implementation of this extended scope.

In the stakeholder workshop, the majority of participants 29 (out of 51 respondents) voted for extending the scope of the Directive to include all MARPOL Annexes as shown in the figure below.

Figure 11. Stakeholder views from the workshop on PD1: Limited range of pollutants covered

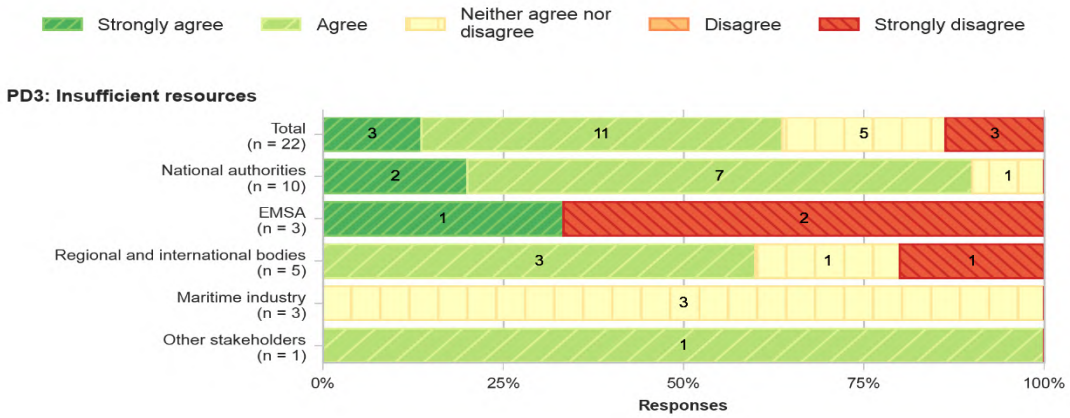
– PD2: *Resources and/or expertise to effectively identify, verify and prosecute pollution from ships are inconsistent across the EU and generally insufficient.*

Fourteen stakeholders interviewed (out of 26) agreed or strongly agreed with problem driver 2 on insufficient resources[143]. In addition, three stakeholders strongly disagreed with the

[143] Those who agreed with problem driver 2 included nine MS authorities.

insufficient resources being a problem driver, and five stakeholders[144] indicated that they neither agree nor disagree with problem driver 2.

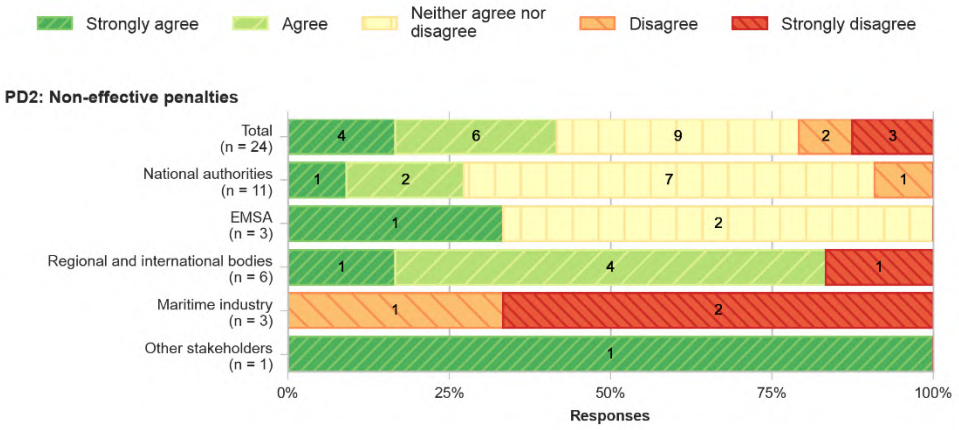
Figure 12. Stakeholder views on PD2: insufficient resources and expertise across Member States



– PD3: *Penalties applied by Member States for illegal pollution from ships do not consistently discourage polluters.*

As presented above, there is contradicting opinions on the dissuasive effect of the penalties. Ten out of 26 stakeholders interviewed agreed or strongly agreed with problem driver 3 on penalties not being effective[145]. However, the views on PD3 were quite diverse, as shown in the figure below.

Figure 13. Stakeholder views on PD2: non-effective penalties



Three Member State authorities interviewed indicated that penalties imposed in their respective countries are considered effective and proportionate to the nature of the pollution. Additionally, one Member State authority disagreed with non-effective penalties being an issue and instead pointed to the limited ability to identify ships as the polluter as a relevant issue hindering the enforcement of the Directive.

[144] Those who neither agreed nor disagreed with problem driver 3 included one MS authority, one regional/international body and three maritime industry stakeholders.

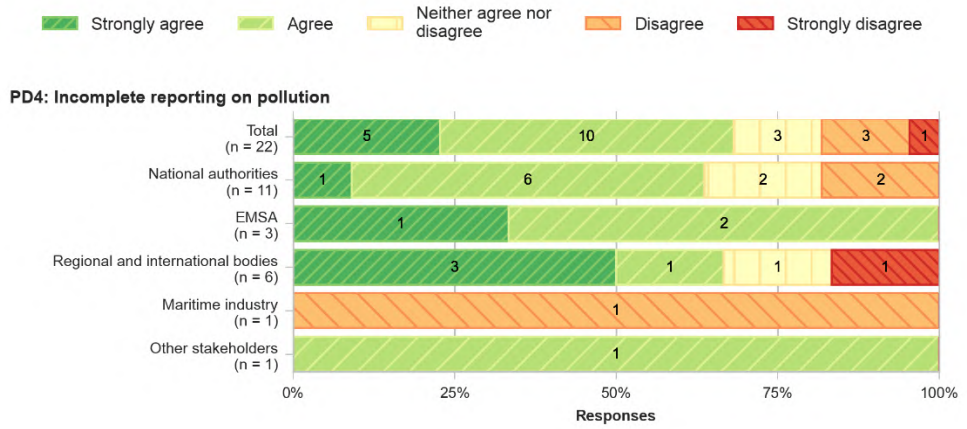
[145] Stakeholders that agreed or strongly agreed include three MS authorities, five regional/international organisations and one environmental NGO.

Furthermore, 23 (out 28) respondents to the OPC selected the option 'Improve the effectiveness of law enforcement within Member State' as a relevant aspect that should be addressed by a revised Directive.

– PD4*: Incomplete reporting by Member States on pollution events and on follow-up activities results in the lack of information on ship-source pollution across the EU.*

Fifteen stakeholders interviewed (out of 26) agreed or strongly agreed with problem driver 4 on incomplete reporting on pollution. Four stakeholders disagreed or strongly disagreed with the incomplete reporting on pollution being a problem driver, and three stakeholders indicated that they neither agree nor disagree with problem driver 4.

Figure 14. Stakeholder views on PD4: incomplete reporting by Member States results in the lack of information on ship-source pollution



Furthermore, 24 (out 28) respondents to the OPC selected the option 'Improve the use and coordination of maritime surveillance and digital reporting systems' as a relevant aspect that should be addressed by a revised Directive.

3.3. Policy measures

The table below summarises stakeholder opinions on each of the policy options and the subsequent subsections give more details on key areas of interest.

Table 18. Stakeholder opinions on policy measures

Policy measure	Stakeholder views	Summary
PMc1 - extension of the scope of the Directive	In the stakeholder workshop 29 out of 51 participants that voted were of the opinion that the scope of the revised Directive must be extended. Twelve Member State (MS authorities) were interviewed and had positive opinions.	Stakeholders in favour
PMc2 - EMSA training and guidance	Sixteen out of 17 stakeholders who provided a response to a question on this measure in the survey (including 11 MS authorities, EMSA and four regional/international bodies) identified guidance and training as a relevant and suitable policy measure.	Stakeholders in favour
PMc3 - expert group	Eleven of the 17 stakeholders who provided a response to a question on this measure in the interviews (including seven out of 12 MS (BE, HR, FI, DE, MT, NL and ES), EMSA and three regional/international bodies) supported holding regular meetings of a dedicated platform. In an ESSF subgroup meeting on waste from ships 9 out of 25 participants that voted were of the opinion that issuing guidelines by the Commission on	Stakeholders in favour

Policy measure	Stakeholder views	Summary
	collection of statistical data would foster the collection of information about illegal discharges from ships.	
PMc4 - information from whistle-blowers	Two stakeholders identified the measure relating whistle-blower provisions suitable for the objective of the Directive. However, other stakeholders endorsed the combination of PM5, PM6, PM7, and PM8, albeit not specifically naming this measure. Generally, stakeholders stated that they lacked sufficient knowledge of the whistle-blower provision to provide an answer on this question.	Stakeholders lack sufficient knowledge to have an opinion.
PMc5 - enhancement of Integrated Maritime Services	In the stakeholder workshop 23 out of 41 participants that voted were of the opinion that this measure would make the biggest difference in increasing cooperation between Member States and information exchange. In addition seven out of the 17 stakeholders (including six MS authorities and one regional body) that responded to this question in the interviews supported this measure. These stakeholders emphasised the value of EMSA tools and the potential advantages of further integration.	Stakeholders in favour
PMc6 - clarifications on liability regime	Generally, there was a lack of sufficient knowledge on the EU liability regime. Only six out of the 21 stakeholders consulted (three MS, three regional bodies) provided their views on this measure in the interviews. Two of them (two MS authorities, BG and CY) agreed with this measure, as they considered that the proposed additional text clarifies the principles stated by international conventions. On the other hand, two industry representatives (ECSA/ICS) stated that the adoption of this measure would be only a partial improvement.	Low stakeholder support, low knowledge and no opposition
PMc7 - obligation to log if and how CleanSeaNet alerts have been verified	Five out of the 12 stakeholders (including four MS authorities and one regional body) who provided a response in the interview identify challenges associated with the implementation of this measure. One MS authority (BG) disagreed with this measure, as they considered that it could be difficult to implement from an operational perspective. Two MS authorities (MT, ES) also highlighted the challenges and additional administrative burden that this policy measure could impose on national authorities if implemented. Furthermore, another MS authority (RO) indicated that there will probably issues implementing these measures, although they are not expected to be significant.	Low stakeholder support and some minor opposition
PM1 - 60% verification rate for CleanSeaNet alerts	In the stakeholder workshop only 6 out of 41 participants that voted supported this measure. 15 out of 30 participants that voted were of the opinion that the verification of CleanSeaNet alerts should remain voluntary and not mandatory as foreseen in this measure. The main issue identified in interviews was the additional resources that would be needed to follow up on every possible pollution incident detected by CSN service.	Stakeholders mainly against
PM2 a & b – type of penalties	No information was provided by stakeholders regarding this measure.	Stakeholders lack sufficient knowledge to have an opinion.
PM3a – level of penalties containing criteria	Six out of the 16 stakeholders interviewed (including four MS authorities (DK, FI, MT, RO) and two regional bodies) supported this measure. Three of these stakeholders underlined that this measure would act in favour of the harmonisation of the level of penalties and strengthen the coordination between MS.	Low stakeholder support but no opposition
PM3b – level of penalties containing values	Four out of the 16 stakeholders (including one MS authority (MT), two regional bodies and one NGO) who provided a response in the interviews supported this measure. However, three MS authorities (BE, NL, ES) stated that this measure would be challenging to implement in practice.	Low stakeholder support but no opposition
PM4 - reporting	In the stakeholder workshop 16 out of 41 participants that voted were of the opinion that this measure would make the biggest difference in increasing cooperation between Member States and information exchange. In addition, in an ESSF subgroup meeting on waste from ships	Stakeholders in favour

Policy measure	Stakeholder views	Summary
	13 out of 25 participants that voted were of the opinion that a regular update of an online platform using a format harmonised with regional and IMO reporting requirements would foster the collection of information about illegal discharges from ships.	
PM5a – information to the public on national websites	Five out of the 12 MS authorities consulted expressed their disagreement with this measure. One MS authority indicated that they do not see the need for a website to be developed at national level, as they believe it would be enough to provide the information through the reporting portal DONA. One MS authority (CY) indicated that the measure is not considered as a measure that could have a significant impact to the objectives of the SSP Directive.	Stakeholders against
PM5b – information to the public on EU website	Five out of the 12 MS authorities consulted agreed with the measure related to the EMSA/European Commission providing public information based on the information reported by Member States on the enforcement of the SSP Directive.	Low stakeholder support but no opposition

– Scope of the future Directive

The stakeholders consulted during the public and targeted consultations, with the exception of industry, were in favour of broadening the scope by including MARPOL Annexes III, IV, V and VI discharge water from scrubbers discharged at sea. A revised Directive would be better adapted to the pace of international developments in the of field pollution prevention if it covers MARPOL Annex I to V substances and Annex VI discharge water from scrubbers into sea. This would also help align with the ambition of the European Green Deal. This was supported by 8 (out of 10) stakeholders during the inception interviews; 15 (out of 31) stakeholders interviewed (including 8 Member State authorities, and 4 regional/international bodies and 3 stakeholders from the maritime sector) as well as 8 (out of 11) responses to the evaluation survey (including input from 8 Member States, 2 NGOs and 2 business organisations/associations). 29 respondents (out of 51) in the stakeholder workshop voted for the extension of the scope to cover Annex I-V and Annex VI discharge water from scrubbers to water with strong support in interventions from 3 NGOs (EIA, Surfrider and IFAW) and the support of one representing industry (Euroshore). The same message came from the public consultation where 23 (out of 28) respondents saw the need to expand the list of pollutants covered by the Directive (including 4 Member State authorities, 8 citizens, 7 NGOs, 2 academia and 2 industry stakeholders), while 5 respondents (all but one representing maritime industry) disagreed. The industry questions the added value in extending the scope of the SSP Directive to further annexes of MARPOL. Their argument is that the MARPOL Convention is already ratified by all Member States who are parties to MARPOL.

The voice of environmental NGOs is consistent in the message that the Directive offers effective tools to prevent pollution and therefore should be extended to polluting substances of concern that are currently not covered by MARPOL. This was supported by IFAW and Surfrider and reemphasised in the stakeholder workshop.

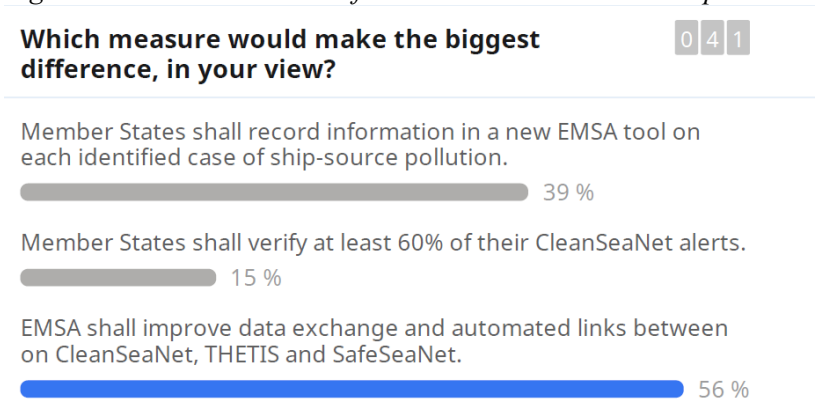
Out of the 26 stakeholders whose input was summarised, six Member State authorities noted a preference towards extending the scope of the Directive to Annex III-V substances and Annex VI residues from scrubbers discharged to the sea. Four Member State authorities were in favour of supporting the alignment of the Directive with all MARPOL Annexes and including air emissions of Annex VI (sulphur and nitrogen oxides).

In brief, Member States generally are in favour of broadening the scope of the Directive to more polluting substances in line with MARPOL, however there is not consensus on the matter. Also, see *PD1* above for complementary information.

– EMSA providing highly specialised support

As per conclusions of the evaluation, Member States see EMSA's support and dedicated EU-wide tools as a great added value of the Directive. When asked during the stakeholder workshop on which EMSA-specific measure could make the biggest difference in the future, the participants chose first the optimised interactions of CleanSeaNet, SafeSeaNet and THETIS (23 out of 41 respondents) and second a new dedicated EMSA platform for information collection and exchange (16% out of 41 respondents). See figure below.

Figure 15. Stakeholder views from the stakeholder workshop on EMSA support tools



One interviewed Member State authority welcomed new features that could help the integration between systems to avoid the duplication of data/information/reporting. These systems are currently isolated, so it would be helpful to be able to access the data from a single source. The Romanian authorities added that all useful information should be integrated and/or automated. French authorities agreed that more links are needed for Annex VI between THETIS, THETIS EU and SafeSeaNet, but confidentiality of data and possibility of alerts being wrong (false positives) must be addressed.

Regarding potential issues or challenges that may arise from the implementation of EMSA specific measures, the Finnish authorities identified potential issues related to restricted access depending on the position/responsibility of the Member State authority. For instance, not being able to access THETIS information if not directly involved in port inspections, although involved in other aspects of ship-source pollution incidents. Also, EUROSHORE pointed to a potential overlapping with other already ongoing expert groups on maritime issues.

Two Member State authorities interviewed recognised the importance of introducing mandatory requirements for Member States to follow up on possible pollution incidents detected by CleanSeaNet service.

Three Member State interviewed indicated they support the idea of EMSA providing public information based on the information reported by Member States on the enforcement of the SSP Directive. The Cypriot authorities stated that this would be most suitable, although a combination of all measures, except the measure on Member States developing national websites with information on pollution incidents and follow-up activities, would be preferable.

On the other hand, one Member State considered that these measures would not have a relevant impact on reducing the level of illegal discharges at sea. Also, ENPRO indicated that all policy measures proposed to address PD4 on incomplete reporting are relevant, although those related to the availability of public information might not have a significant impact on the objectives of the SSP Directive.

– More guidance at EU level

Thirteen stakeholders interviewed (13 out of 26)[146] supported policy measures on guidance and training activities on detection to facilitate evidence gathering for ship-source pollution offences to authorities responsible for verification and prosecution. The Spanish authorities also considered training relevant, as the limited resources and expertise in the national administration is not because of the lack of personnel, but due to the lack of know-how in ship-source pollution matters and procedures. They consider that training should be aligned and coordinated with homogenised principles and procedures.
In terms of identifying the most suitable policy measures to address Problem Driver 2, stakeholders consulted mainly pointed to the potential usefulness and effectiveness of a combination of all the measures proposed[147]. It was mentioned that Expert Groups had been recognised as an efficient way to move forward with new ideas related to a specific topic.
With regards to the priority topics that should be the focus of the expert group, stakeholders identified the following:

– **Sharing of best practices**: Five stakeholders who responded to this question (out of 10) identified this as a relevant topic to be covered by the Expert Group.[148]

– **Enhance harmonisation of the implementation of the Directive**: The Bulgarian authorities indicated that a work group could steer the development of guidance documents and ensure that the experts are available for developing guidance, presenting at incidents and experience sharing. EUROSHORE also supported this as a relevant topic to be covered by the Expert Group.

– **Coordination with other relevant regulations**: EMSA indicated that the Expert Group should work in coordination with the established regional networks to harmonise the enforcement of relevant regulations addressing ship-source pollution.

– **Exchange of information and strengthen coordination between MS authorities**: These topics were identified by OSPAR/Bonn Agreement and EUROSHORE representatives.

– **Case studies**: The Finnish authorities indicated that, based on their experience, the most valuable meetings are those where real experiences are shared. This could be done by presenting case studies or explaining something they have tested.

– **Monitoring reporting compliance**: OSPAR/Bonn agreement representative see the focus of the group on reporting to monitor if and why it is not done and ensure information exchanged/updated either through annual meetings or with participation of a representative of the Bonn Agreement to the SSP directive expert group meetings.

[146] These include nine MS authorities, EMSA and two regional/international bodies
[147] These include views from nine MS authorities, EMSA and two regional/international bodies
[148] These include 4 MS authorities and one regional/international body.

However, French authorities shared a concern that a lot of committees of expert groups already exist and that their usefulness usually depends on the scope and planning of the new group. They stated that, if the meeting is held annually, it could be an interesting opportunity to improve coordination and harmonisation between Member State authorities. One authority mentioned that Member States are already part of the ESSF and the mandate and scope of work of the new group should be carefully considered.

– Penalties

Stakeholders were asked to identify the most suitable policy measures to address Problem Driver 3. Four stakeholders[149] identified the measure of non-regulatory nature for establishing the level of penalties as the most suitable or among the most suitable measures to address PD3. Concerning the impact of this measure on the level of penalties applied, three stakeholders[150] agreed that the measure would have a significant impact. Furthermore, two MS authorities considered the measure would result in an increase in the level of the penalties applied to a moderate extent, and one MS authority to a limited extent. However, Spanish authorities consider that the ability to impose penalties is contingent on the ability to gather sufficient evidence to support the case, but the level of penalties is not likely to change as a result of this measure. Furthermore, Cypriot authorities believe that the outcome will vary case by case.

Five out of 20 stakeholders agreed with the principle regarding of serious negligence and four stakeholders[151] disagreed with this principle, as they consider that intent should always be proved. The majority of the stakeholders neither agreed nor disagreed with the proposed principle or indicated that they did not know the answer.

Seven out of 20 stakeholders[152] agreed with the principle regarding penalties being imposed on a pre-defined legal person that should indicate who the correct legal person is to assume liability for the violation. On the other hand, three maritime industry stakeholders[153] disagreed with this principle, as they consider that pre-defining a legal person to indicate responsibility is far reaching and excessive. The majority of the stakeholders neither agreed nor disagreed with the proposed principle or indicated that they did not know the answer.

Five out of 20 stakeholders[154] agreed with the principle regarding estimation of the level of the penalty being based on an estimate of the size and quality of the discharge. According to the Bulgarian authorities, it is considered easier to set the penalty first taking into consideration the quantity and size of the spill. However, the Cypriot authorities indicated that determining the level of the penalty based on the size of the discharge is challenging. On the other hand, one Member State authority disagreed with this principle, as they consider that this criterion can only be applied to certain substances (e.g. oil) but not to all polluting substances involved in ship-source pollution. The majority of the stakeholders neither agreed nor disagreed with the proposed principle or indicated that they did not know the answer.

[149] These include two MS authorities and two regional/international bodies.
[150] These include one MS authority, one regional/international boy and one environmental NGO.
[151] These include one MS authority and three maritime industry stakeholders.
[152] These include six MS authorities and one NGO.
[153] These include three maritime industry stakeholders.
[154] These include four MS authorities and one NGO.

Seven out of 20 stakeholders[155] agreed with the principle regarding possibility to appeal against administrative sanction in a court of law. The Bulgarian authorities and BIMCO indicated that it should always be possible for everyone to appeal against a sanction that could be unfair. However, Spanish authorities reported that the principle is already included as such in the Spanish law. Furthermore, OSPAR/Bonn Agreement representative considers that it depends on the Member States applying the penalty, and that it is also convenient to know what is done in the actual practice and what is more efficient in different Member States. IPTA considers that increasing penalties or liabilities will not decrease the level of illegal discharges.

With regards to the regulatory approach of including criteria for setting the level of administrative penalties in the Directive, there was a general agreement over harmonisation of penalties at EU level. However, specific support to this measure was only provided by four Member State authorities and four international/regional bodies[156]. In this context, Belgian and Dutch authorities regard the harmonisation of monetary penalties to be very difficult in practice because of the variety of legal frameworks. Furthermore, Belgian authorities consider existing administrative penalties are already effective and dissuasive. The Spanish authority representative believes that the size and quantity of the discharge should be the most important factors to consider. Other factors, such as the intentionality or impact of the discharge, could also be considered, but only as secondary factors influencing the monetary penalty imposed. With regards to the criteria proposed for setting monetary penalties, stakeholders consulted provided mixed views.

It is also worth mentioning that the harmonisation of penalties, as well as raising penalties to be significant were selected in the OPC as a measure to be considered for the review of the SSP Directive, where seven out of 16 of the respondents indicated that they consider this measure useful or very useful.

– Differences among stakeholder groups

The main two points of disagreement throughout the consultations were the following:

(1) Environmental NGOs advocate for increasing the scope of polluting substances to go beyond MARPOL Annexes and cover other types of polluting substances regulated under the MARPOL Convention. Whilst Member States have divergent views on this issue and the industry strongly disagrees with extending the scope of the Directive in principle and even more so disagrees with going beyond MARPOL.

(2) Industry advocates to align the liability threshold (i.e. remove the provision on serious negligence) and geographical scope of the Directive with MARPOL, whereas most of the remaining stakeholders disagree. Industry perceives this factor and referring to serious negligence as one limiting legal certainty. Other stakeholders (e.g. EIA intervention at stakeholder workshop) would like to see the liability threshold maintained at the same level as currently as to not make it more difficult to prosecute the offenders. No court case has been identified since 2005 where there was unfair treatment of crew members in a ship-source pollution incident.

[155] These include five MS authorities, one industry stakeholder and one NGO.
[156] REMPEC supported this measure to be applicable only for administrative penalties.

In the context of the second point, stakeholders consulted provided mixed views on the policy measure for clarifying the exception concerning infringement for crew members, as well as conditional support in some cases (e.g., if some conditions were satisfied). Two Member State authorities and one regional/international body agreed with the measure, as they considered that the proposed additional text is similar to the principle stated by other international conventions. However, three other stakeholders (including two maritime industry stakeholders, ECSA and ICS, as well as one Member State authority) have expressed their opposition to this measure. Representatives from ECSA and ICS considered that this measure would only be a partial improvement over the current Directive and could only be supported if a similar provision was developed for ship-owners.

Also, stakeholders consulted provided limited views regarding the measure on a provision being included in the Directive on whistle-blowers, as they referred to their limited expertise on the implications of this policy measure. In this regard, one Member State authority agreed with this measure, although they pointed to the different procedures that already in place in different Member States regarding whistle-blowers and indicated that flexibility would be needed in each Member State to implement this measure accordingly. One NGO supported this measure during their intervention at the stakeholder workshop.

– Costs of the future directive

Member State authorities were asked to provide an estimate of the expected costs associated with a potential extension of the scope of the Directive. However, limited information was provided, as several authorities stated that providing this estimate is significantly challenging. Some of the authorities stated that this is because it is difficult to separate the costs as they are part of their daily job. Additional costs were cited by the Finnish authorities as a result of the need for new/improved sensors. The cost could account for several million EUR. On the other hand, German authorities suggested that in terms of costs of expanding the scope to include additional annexes to MARPOL, there are no numbers on this, but that it would not be considered significant. ECSA outlined that they have no specific information on costs, but that they believe that additional costs for the shipping industry resulting from the proposed policy measures would most likely arise through defending ships and seafarers from unwarranted criminalisation in the prosecution under the Environmental Crime Directive.

Information on costs associated with measures on EMSA highly specialised support was mainly provided by EMSA. Additionally, REMPEC provided an estimate of the cost associated with the development and delivery of training sessions at regional and/or national level. The cost was estimated at the level of approximately USD 50,000 if organised at regional level, and USD 10,000 if done at national level.

Spanish authorities estimated 0.5 additional FTE required annually to perform tasks related to uploading data to a new dedicated EMSA platform. It was specified that most of this time would be spent gathering the information on ship-source pollution incidents. French and German authorities indicated that systems to collect this information are already in place at national level. Therefore, only links to the new platform to transfer this information would be needed. As a result, they expect minimum additional costs due to the implementation of this measure. On the other hand, the Maltese authorities expected additional costs would arise from the new dedicated EMSA platform.

Six Member State authorities interviewed (out of 12) estimated that the time needed for Member State authorities to collect and submit information about prosecution for pollution from ships and penalties imposed would be more than two days annually. In addition, two

Member State authorities indicated that the expected time would be between one to two hours. The Spanish and Romanian authorities emphasised that the time would depend on the characteristics of each procedure (e.g. administrative or criminal). In that sense, the Croatian authorities also clarified that the estimation provided is only referred to administrative proceedings – and related to the time needed to upload the information once it is gathered. The most challenging and time-consuming activities would still be related to collecting and summarising the information related to the case, which are not included in the estimation of 2h.

3.4 Position papers

Seven position papers were submitted when providing feedback on the Inception Impact Assessment (IIA), mostly from NGOs (six out of seven). The majority of position papers submitted touched on the following areas of revisions: the scope of the future Directive (Annex I-V substances and Annex VI discharge water from scrubbers) (n=6), mechanisms for monitoring compliance (n=3) and one NGO commented on the importance of harmonise legislation on sea pollution at EU level.

Also, five position papers were submitted by OPC respondents. However, two of these position papers had already been received during the IIA. The other three papers were submitted by a business, academia and a local authority. Most of them touched on the extension of the scope of the Directive (Annex I-VI).

Four position papers were received by the survey respondents in the Evaluation phase (two from NGOs, one from an industry stakeholder and one from academia), although all of them were updates of those already been submitted to previous phases of the study, including the IIA and/or the OPC.

Annex 3 - Who is affected and how?

1. PRACTICAL IMPLICATIONS OF THE INITIATIVE

The revision of the Ship-Source Pollution Directive aims at improving the level of pollution prevention by discouraging ships operating in European seas from illegal discharges of polluting substances. The impacts of the preferred policy option are expected to fall on different stakeholder groups: national competent authorities, EMSA, industry (i.e. ship owners/operators including the crews of the ships) and citizens. It is not expected to affect SMEs significantly. The preferred policy option B, provides for strengthened cooperation between Member States in their enforcement activities, supported by the technical and technological assistance of EMSA and using the same definition of infringement by all Member States.

Administrations

Member State competent authorities would be the key beneficiary of the initiative. More training, guidance and means for cooperation would be offered to Member States in order to increase the know-how of all relevant national authorities in the EU. Member States will also benefit from a dedicated expert group, the improved EMSA digital tools and a new dedicated reporting tool. These technological developments are specifically tailored to increase the availability and user-friendliness of information on potential illegal discharges for the Member States. Although Member States will be obliged to provide more feedback on CleanSeaNet alerts, such reporting will be simplified through the new user-friendly platform.

EMSA is already providing significant support, with costs estimated at around EUR 5.37 million annually in the baseline scenario for CleanSeaNet satellite surveillance and ship-source pollution training. With the broadened scope of the Directive, EMSA will have to tailor its instruments to detect and collect information on more potential discharges and enhance the data exchange tools and automated links. EMSA will have to develop and maintain a new reporting tool dedicated to the collection of information on ship-source pollution, including a possibility for whistle-blowers to alert on a potential incident. Other key obligations under the initiative will be providing training to the national authorities and a website to share relevant information on ship-source pollution with the public. Thus, the costs for EMSA are expected to increase relative to the baseline.

The European Commission would provide more support by establishing a permanent expert group as forum for the exchange of lessons learned, for discussing guidelines or the implementing act(s). Thus, the costs for the Commission are expected to increase relative to the baseline.

Businesses

The preferred policy option does not include requirements for ship operators. However, more effective enforcement and prosecution, may lead to more penalties in the first years of its implementation. This is eventually expected to have a deterrent effect on non-compliant ship operators. No costs are expected for the compliant ship operators. At the same time, the environmental benefits are expected to benefit all.

The initiative can be considered non-relevant for SMEs. The extension of the Directive's scope to cover additional substances under MARPOL may be relevant for recreational craft and fishing vessels, sector segments with high SME participation. However, the fact that this extension is focused on the enforcement of international regulations means that no impact on costs is expected for the compliant SMEs. Improving the identification of offenders and prosecution (deterrence by means of penalties) is expected to contribute to a level playing field, with a positive impact on the functioning of the internal market and competition.

The initiative will result in better observance of the right to justice by improving enforcement via the introduction of more effective and proportionate remedies, ensure fair trial by clarifying the limits of liability for ISM companies, masters and crew members and by improving definition of infringements.

Citizens

Society as a whole is affected by the environmental and health impacts of discharges of pollutants from ship operations. Despite recent progress, maritime transport continues to pose pressure on the marine environment. The initiative will act on discouraging illegal discharge from ships and hence contribute to a cleaner marine environment, coastline and beaches. Citizens will benefit from clean bathing water, improved environmental status of the marine waters as well as preserved marine ecosystems. The initiative will also ensure better access to information on ship-source pollution incidents, through a regularly updated EU-wide website.

2. SUMMARY OF COSTS AND BENEFITS

I. Overview of Benefits (total for all provisions) – Preferred Option *(Policy option B)*		
Description	***Amount***	***Comments***
Direct benefits		
Enforcement costs savings for Member States administrations, expressed as present value over 2025-2050 relative to the baseline	EUR 1.8 million	Enforcement costs savings for the Member States administrations are driven by the further integration and enhancements in the data exchange tools and automated links in the Integrated Maritime Services based on CleanSeaNet, THETIS, THETIS EU and SafeSeaNet by EMSA that is expected to lead to a reduction in the time spent for verifying CleanSeaNet alerts.
Administrative costs savings for Member States administrations, expressed as present value over 2025-2050 relative to the baseline	EUR 0.9 million	The development of a dedicated reporting tool for data collection would lead to significant time savings for reporting to the European Commission under the SSP Directive.
Enhanced surveillance capabilities of Member States administrations	Significant improvement in surveillance capabilities	Improvement of the surveillance and enforcement capabilities of Member States with the introduction of new technical support tools by EMSA, linked to the scope extension, and the enhanced knowledge sharing activities and data collection tools and their integration.
Improvement in enforcement of identified infringements by Member States administrations	Improvement in enforcement capabilities of Member States administrations	

I. Overview of Benefits (total for all provisions) – Preferred Option *(Policy option B)*		
Description	***Amount***	***Comments***
Infringements will be more effectively subject to penalties	Higher probability of being subject to penalties	Higher probability of identifying infringements and imposing penalties, due to enhanced support in enforcement activities.
Improvement in dissuasiveness of penalties	Improvement in the effectiveness and eventually dissuasiveness of penalties	
Awareness raising	Improved awareness raising and visibility to the public	Improved awareness rising as a result of increased reporting by Member States and public information sharing through a website.
Indirect benefits		
Functioning of the internal market	Positive impact on the functioning of the internal market and competition	Improving the identification of offenders and prosecution (deterrence by means of penalties) is expected to contribute to a level playing field.
Technological development	Accelerated deployment of innovation	Accelerated deployment of innovative technologies is expected due to the deployment of new technical solutions to meet the requirements of the revised Directive, specifically on surveillance and evidence collection.
Governance, participation and good administration	Improved information exchange and opportunities for enhanced Member State governance	Improvement in information availability, exchange and Member State collaboration in marine protection. In addition, public participation is encouraged by improved transparency and dedicated portal with information on ship-source pollution.
Reduction in external costs from oil spills, expressed as present value over 2025-2050 relative to the baseline	EUR 690.5 million	The reduction in external costs comes from improved environmental conditions as an indirect impact of the dissuasive effect of the improved enforcement and environmental awareness, leading to a shift in industry behaviour.
Administrative cost savings related to the 'one in, one out' approach*		
-	-	-

II. Overview of costs – Preferred option *(Policy option B)*							
		Citizens/Consumers		**Businesses**		**Administrations**	
		One-off	**Recurrent**	**One-off**	**Recurrent**	**One-off**	**Recurrent**
Direct adjustment costs relative to the baseline (i.e. present value over 2025-2050)		-	-	-	-	For EMSA: additional costs of EUR 2.9 million For European Commission: additional costs of EUR 0.2 million	For EMSA: additional costs of EUR 119.7 to 128.5 million For European Commission: additional costs of EUR 0.6 million
Direct enforcement costs relative to the baseline (i.e. present value over 2025-2050)		-	-	-	-	-	For Member States: additional costs of EUR 2.5 million
Costs related to the 'one in, one out' approach							
Total	Direct adjustment costs	-	-	-	-		
	Indirect adjustment costs	-	-	-	-		
	Administrative costs (for offsetting) relative to the baseline (i.e. present value over 2025-2050)	-	-	-	-		

3. RELEVANT SUSTAINABLE DEVELOPMENT GOALS

III. Overview of relevant Sustainable Development Goals – Preferred Option *(Policy option B)*		
Relevant SDG	**Expected progress towards the Goal**	**Comments**
SDG no. 3 – good health and well-being	Reduced illnesses (e.g. human exposure at bathing sites, contaminated fish for human consumption) by targeting the illegal release into sea of hazardous polluting substances from ships and preventing contamination from ships into sea.	The initiative, through the reinforcement of the MARPOL standards and more substances covered by the Directive, directly contributes to SDG Target 3.9 *("By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.").*
SDG no. 14 - life below water	Discouraging the shipping industry from discharging waste into sea will reduce pollutants, including hazardous contaminants, plastics and nutrients going into sea.	The initiative, through the dissuasive effect of penalties, directly contributes to SDG Target 14.1 *("By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.").*
SDG no. 16 - peace, justice and strong institutions	The initiative will promote the widespread application and use of international MARPOL standards by ensuring legal clarity in defining infringements. It will also support cooperation between Member States to deal with related infringements effectively and efficiently.	The initiative directly contributes to SDG Target 16.a *("Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime.").*

Annex 4 - Analytical methods

1. DESCRIPTION OF THE ANALYTICAL METHODS USED

For the assessment of the baseline and of the impacts of the policy options, a conceptual framework has been developed in the context of the impact assessment support study[157] that links specific influencing factors to indicators relevant for the performance of the Directive. In addition, an Excel-based tool has been developed that draws on the Standard Cost Model for the assessment of the administrative costs and also includes an assessment of the possible environmental benefits. The Excel-based tool builds extensively on data provided by EMSA, including from CleanSeaNet, and the analysis of stakeholders' feedback. The proposed measures which involve the amendment of the Directive are assumed to be implemented from 2025 onwards, so that the assessment has been undertaken for the 2025-2050 period and refers to EU27. Costs and benefits are expressed as present value over the 2022-2050 period, using a 3% discount rate.

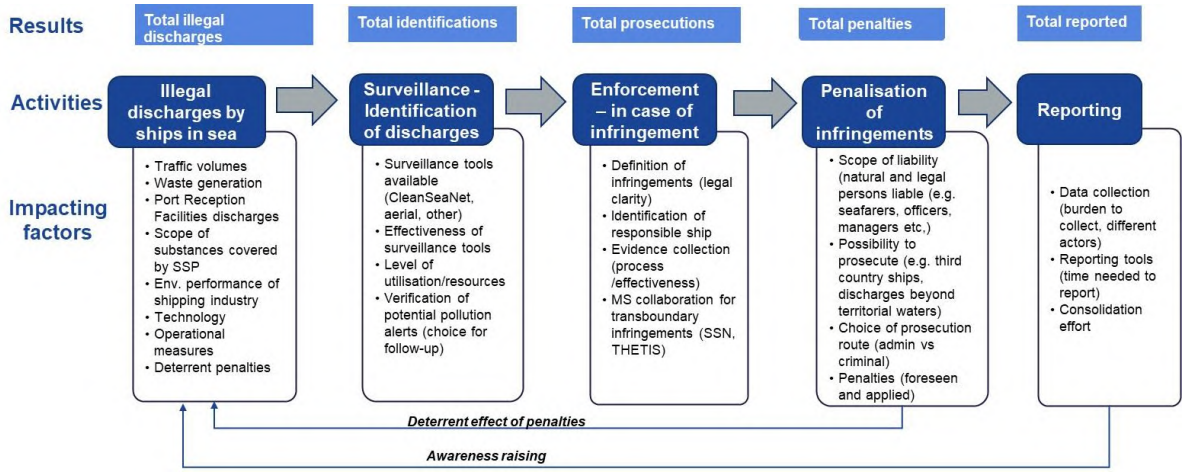
The baseline scenario for this initiative draws on the results of the PRIMES-Maritime transport model by E3Modelling, a specific sub-module of the PRIMES and PRIMES-TREMOVE models, and the conceptual framework mentioned above. The model has a successful record of use in the Commission's energy, transport and climate policy assessments. In particular, it has been used for the impact assessments underpinning the "Fit for 55" package[158], the impact assessments accompanying the 2030 Climate Target Plan[159] and the Staff Working Document accompanying the Sustainable and Smart Mobility Strategy[160], the Commission's proposal for a Long Term Strategy[161] as well as for the 2020 and 2030 EU's climate and energy policy framework.

Conceptual framework

The assessment of the baseline scenario and of the policy options is based on the identification and to the extent possible quantification of several relevant factors (contextual or internal to the Directive's scope), whose current and/or expected developments are expected to affect the probability of ships generating illegal discharges and the potential of their identification, prosecution and application of penalties. A process flow diagram that links specific influencing factors to indicators relevant for the performance of the Directive has been developed (see Figure 16).

[157] Ricardo (2023), Impact Assessment of Directive 2005/35/EC on ship-source pollution
[158] Delivering the European Green Deal | European Commission (europa.eu)
[159] SWD(2020)176 final.
[160] EUR-Lex - 52020SC0331 - EN - EUR-Lex (europa.eu)
[161] Source: 2050 long-term strategy (europa.eu)

Figure 16. Process flow from discharges to identification, prosecution, penalisation and reporting



Source: Ricardo (2023), Impact assessment support study

As can be seen in Figure 16, the process leading from an illegal discharge, all the way to its reporting, contains a number of specific activities which the SSP Directive or other external factors directly or indirectly affect. These activities include the following:

(1) The act of illegally discharging substances in the sea. The total amount of illegal discharges under the SSP Directive, depends, first and foremost on the scope of the substances under the Directive. It is also affected by a number of contextual factors, such as the volume of maritime traffic, the amount of waste generated by ships and the use of Port Reception Facilities. It is further affected by the application of technological and operational advancements by the shipping industry to improve its environmental performance, actions driven by increasing environmental awareness as well as by the deterrent effect of enforcement measures.

(2) Identification/detection of discharges by surveillance activities and on-site verification undertaken. The total portion of the illegal discharges actually identified is dependent, beyond the total number of illegal discharges, on the availability, effectiveness and deployment of surveillance tools and on-site verification assets and resources.

(3) Enforcement actions of relevant national authorities resulting in the prosecution of identified polluters. How identified discharges (elaborated in point 2 above) result in prosecution cases depends on the definition (and clarity) of an infringement, the potential to identify the polluter responsible for the pollution (either through direct observation, use of analytical tools or follow-up inspections), the evidence required to enact a prosecution, and the effectiveness of Member State collaboration in cases of incidents of cross-border nature.

(4) Penalisation of offenders. How the prosecution process results in penalties will depend on the scope of liability (natural or legal persons responsible for the infringements). Also, for specific cases, it will depend on the legal basis to process a prosecution, the choice of route (administrative or criminal) and the level of penalties foreseen for each type of infringement by Member States.

(5) Reporting of the results of the surveillance, verification and prosecution process (law enforcement chain), in order to understand the effectiveness of the Directive's application and supply relevant data across the EU to interested parties. This will depend not only on

the results of the previous activities, but also on how well data collection and reporting tools are applied.

Developments affecting one area of the process are not standalone and are likely to have an effect on the rest of the process as well. A knock-on effect is delivered either to activities standing downstream in the process (e.g. an improved detection of (illegal) discharges as a result of improvements in surveillance activities, is likely to lead to an increase in the total number of penalties imposed), or as a result of the feedback effects identified in the form of the deterrent effects of the penalties (i.e. an increase in the frequency in which illegal discharges are identified and penalised, is likely to deter future infringements), or due to awareness raised as a result of reputation risks (i.e. reporting the incidents and making this information available to the public). This framework is used, where possible, for the assessment of the environmental benefits of the different policy options.

Modelling framework

The PRIMES-Maritime transport model is a specific sub-module of the PRIMES and PRIMES-TREMOVE models and aims to enhance the representation of the maritime sector within the energy-economy-environment modelling nexus. The model, which can run in stand-alone and/ or linked mode with PRIMES and PRIMES-TREMOVE, produces long-term transport activity, energy and emission projections, until 2070, separately for each EU Member State. The coverage of the model includes the European intra-EU maritime sector as well as the extra-EU maritime shipping. The model covers both freight and passenger international maritime. PRIMES-Maritime focuses only on the EU Member States, therefore trade activity between non-EU countries is outside the scope of the model. The model considers the transactions (bilateral trade by product type) of the EU-Member States with non-EU countries and aggregates these countries in regions. Several types and sizes of vessels are considered.

PRIMES-Maritime features a modular approach based on the demand and the supply modules. The demand module projects maritime activity for each EU Member State by type of cargo and by corresponding partner. Econometric functions correlate demand for maritime transport services with economic indicators considered as demand drivers, including GDP, trade of energy commodities (oil, coal, LNG), trade of non-energy commodities, international fuel prices, etc. The supply module simulates a representative operator controlling the EU fleet, who offers the requested maritime transport services. The operator of the fleet decides the allocation of the vessels activity to the various markets (representing the different EU MS) where different regulatory regimes may apply (e.g. environmental zones). The fleet of vessels is disaggregated into several categories. PRIMES-Maritime utilises a stock-flow relationship to simulate the evolution of the fleet of vessels throughout the projection period and the purchasing of new vessels.

PRIMES-Maritime solves a virtual market equilibrium problem, where demand and supply interact dynamically in each consecutive time period, influenced by a variety of exogenous policy variables, notably fuel standards, pricing signals (e.g. Emission Trading Scheme), environmental and efficiency/operational regulations and others. The PRIMES-Maritime model projects energy consumption by fuel type and purpose as well as CO2, methane and N2O and other pollutant emissions. The model includes projections of costs, such as capital, fuel, operation costs, projections of investment expenditures in new vessels and negative externalities from air pollution.

The model serves to quantify policy scenarios supporting the transition towards carbon neutrality. It considers the handling of a variety of fuels such as fossil fuels, biofuels, synthetic fuels produced from renewable electricity, hydrogen produced from renewable electricity (for direct use and for use in fuel cell vessels) and electricity for electric vessels. Well-To-Wake emissions are calculated thanks to the linkage with the PRIMES energy systems model which derives ways of producing such fuels. The model also allows to explore synergies with Onshore Power Supply systems. Environmental regulation, fuel blending mandates, greenhouse gas emissions reduction targets, pricing signals and policies increasing the availability of fuel supply and supporting the alternative fuel infrastructure are identified as drivers, along fuel costs, for the penetration of new fuels. As the model is dynamic and handles vessel vintages, capital turnover is explicit in the model, influencing the pace of fuel and vessel substitution.

The main data sources for inputs to the PRIMES-Maritime model, such as for activity and energy consumption, comes from EUROSTAT database and from the Statistical Pocketbook "EU transport in figures"[162]. Other data comes from different sources such as research projects (e.g. TRACCS project) and reports. PRIMES-Maritime being part of the overall PRIMES and PRIMES-TREMOVE transport model is calibrated to the EUROSTAT energy balances and transport activity; hence the associated CO2 emissions are assumed to derive from the combustion of these fuel quantities. The model has been adapted to reflect allocation of CO2 emissions into intra-EU, extra-EU and berth, in line with data from the MRV database[163]. For air pollutants, the model draws on the EEA database. In the context of this exercise, the PRIMES-Maritime model is calibrated to 2005, 2010 and 2015 historical data.

Additional source used

The quantification of the waste discharged at sea is based on the Impact Assessment supporting the revision of the Port Reception Facilities Directive[164]. To provide for an estimate of what is (potentially) discharged at sea, the approach developed for this Impact Assessment consisted in estimating a "**waste gap**" for various waste types, which is defined as the gap between the waste expected to be generated on board of the ship and the waste actually delivered in ports, based on waste delivery data available. This estimations were based on:

- The ***MARWAS model***[165], which is focused on *merchant and passenger ships*, and provided calculations of the waste gap for **oily waste and sewage**;

- Existing reports and literature[166], which allowed for the calculation of the waste gap for **garbage** from *all types of ships*, including fishing vessels and recreational craft.

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[162] https://transport.ec.europa.eu/media-corner/publications/statistical-pocketbook-2021_en

[163] https://mrv.emsa.europa.eu/#public/eumrv

[164] European Commission (2018). Commission staff working document, Impact Assessment on port reception facilities for the delivery of waste from ships

[165] The MARWAS model, which was developed and applied in the context of the impact assessment support study by Ecorys (2016) has calculated volumes of waste generation on board of vessels, and estimates of expected waste delivery volumes for a list of 29 ports, which together represent 35% of the throughput of all EU merchant ports, and are located across the EU. These volumes were compared to waste delivery data obtained from the same ports included in the list.

[166] In particular the study commissioned by the European Commission (DG ENV) "to support the development of measures to combat a range of marine litter resources" to Eunomia (2016), which has analysed the issue of marine litter from sea-based sources.

A detailed **analysis of waste volumes** is provided in Annex 5 of the impact assessment accompanying the PRF[167].

An additional source of quantitative information used is EMSA CleanSeaNet (CSN) - Detections and Feedback data (2015-2021)[168]. The database indicates for each CSN detection its sequential number, the coordinates, the length and area of the detection, the satellite and sensor used to acquire the image, and information on the feedback: (i) whether feedback is available for this alert and the type of feedback report; (ii) the method used to perform the verification.

2. BASELINE SCENARIO

In order to reflect the fundamental socio-economic, technological and policy developments, the Commission prepares periodically an EU Reference Scenario on energy, transport and GHG emissions. The socio-economic and technological developments used for developing the baseline scenario for this impact assessment build on the latest "EU Reference 2020 scenario" (REF2020)[169]. The same assumptions have been used in the policy scenarios underpinning the impact assessments accompanying the "Fit for 55" package[170].

Main assumptions of the Baseline scenario

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

Economic assumptions

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

Population projections from Eurostat[171] are used to estimate the evolution of the European population, which is expected to change little in total number in the coming decades. The GDP growth projections are from the Ageing Report 2021[172] by the Directorate General for Economic and Financial Affairs, which are based on the same population growth assumptions.

Table 19. Projected population and GDP growth per Member State

	Population			GDP growth	
	2020	2025	2030	2020-'25	2026-'30
EU27	447.7	449.3	449.1	0.9%	1.1%
Austria	8.90	9.03	9.15	0.9%	1.2%
Belgium	11.51	11.66	11.76	0.8%	0.8%

[167] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD%3A2018%3A0021%3AFIN
[168] https://www.emsa.europa.eu/publications/item/4645-cleanseanet-detections-and-feedback-data-2020.html
[169] EU Reference Scenario 2020 (europa.eu)
[170] Policy scenarios for delivering the European Green Deal (europa.eu)
[171] EUROPOP2019 population projections: Eurostat - Data Explorer (europa.eu)
[172] The 2021 Ageing Report : Underlying assumptions and projection methodologies The 2021 Ageing Report: Underlying Assumptions and Projection Methodologies | European Commission (europa.eu)

	Population			GDP growth	
	2020	2025	2030	2020-'25	2026-'30
Bulgaria	6.95	6.69	6.45	0.7%	1.3%
Croatia	4.06	3.94	3.83	0.2%	0.6%
Cyprus	0.89	0.93	0.96	0.7%	1.7%
Czechia	10.69	10.79	10.76	1.6%	2.0%
Denmark	5.81	5.88	5.96	2.0%	1.7%
Estonia	1.33	1.32	1.31	2.2%	2.6%
Finland	5.53	5.54	5.52	0.6%	1.2%
France	67.20	68.04	68.75	0.7%	1.0%
Germany	83.14	83.48	83.45	0.8%	0.7%
Greece	10.70	10.51	10.30	0.7%	0.6%
Hungary	9.77	9.70	9.62	1.8%	2.6%
Ireland	4.97	5.27	5.50	2.0%	1.7%
Italy	60.29	60.09	59.94	0.3%	0.3%
Latvia	1.91	1.82	1.71	1.4%	1.9%
Lithuania	2.79	2.71	2.58	1.7%	1.5%
Luxembourg	0.63	0.66	0.69	1.7%	2.0%
Malta	0.51	0.56	0.59	2.7%	4.1%
Netherlands	17.40	17.75	17.97	0.7%	0.7%
Poland	37.94	37.57	37.02	2.1%	2.4%
Portugal	10.29	10.22	10.09	0.8%	0.8%
Romania	19.28	18.51	17.81	2.7%	3.0%
Slovakia	5.46	5.47	5.44	1.1%	1.7%
Slovenia	2.10	2.11	2.11	2.1%	2.4%
Spain	47.32	48.31	48.75	0.9%	1.6%
Sweden	10.32	10.75	11.10	1.4%	2.2%

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

International energy prices assumptions

Alongside socio-economic projections, transport modelling requires projections of international fuel prices. The projections of the POLES-JRC model – elaborated by the Joint Research Centre and derived from the Global Energy and Climate Outlook (GECO[173]) – are used to obtain long-term estimates of the international fuel prices. The table below shows the oil prices assumptions of the baseline and policy options of this impact assessment.

Table 20. Oil prices assumptions

in $'15 per boe	2015	2020	2030	2040	2050
Oil	52.3	39.8	80.1	97.4	117.9

[173] https://ec.europa.eu/jrc/en/geco

in €'15 per boe	2015	2020	2030	2040	2050
Oil	47.2	35.8	72.2	87.8	106.3

Source: Derived from JRC, POLES-JRC model, Global Energy and Climate Outlook (GECO)

Technology assumptions

Modelling scenarios is highly dependent on the assumptions on the development of technologies - both in terms of performance and costs. For the purpose of the impact assessments related to the "Climate Target Plan" and the "Fit for 55" policy package, these assumptions have been updated based on a rigorous literature review carried out by external consultants in collaboration with the JRC. Continuing the approach adopted in the long-term strategy in 2018, the Commission consulted on the technology assumption with stakeholders in 2019. In particular, the technology database of the PRIMES and PRIMES-TREMOVE models (together with GAINS, GLOBIOM, and CAPRI) benefited from a dedicated consultation workshop held on 11th November 2019. EU Member States representatives also had the opportunity to comment on the costs elements during a workshop held on 25th November 2019. The updated technology assumptions are published together with the EU Reference Scenario 2020[174]. The same assumptions have been used in the context of this impact assessment.

Key global trends and megatrends

The baseline also incorporates foresight megatrends[175] and developments captured in the 2022 Strategic Foresight Report[176]. Among others, it captures the trend of increasing demand for transport as population and living standards grow. The 2022 Strategic Foresight Report also reconfirms the existing megatrends identified in the 2021 Strategic Foresight Report[177] and more specifically, the megatrends of "Climate change and environmental degradation" and that of "Accelerating technological change and hyperconnectivity" that relate to the ongoing twin green and digital transitions. The ability of the EU to achieve these twin transitions very closely relates to the deployment of existing and new technologies in scale and their appropriate framing with relevant policies to achieve their maximum effectiveness. "Enabling a greener transport sector with digital technologies" is one of the areas where the twinning of the green and digital transitions is expected to have a major effect. Relevant to the SSP Directive revision, exploiting new technologies, such as the use of sensors to better monitor environmental performance is one of the key relevant challenges identified. The ongoing technological developments would positively influence the baseline because the technological drive would make more digital solutions available on the market for detection and verification. It is however uncertain if Member States would prioritise and allocate resources to the new tools. In addition, without further EU level action EMSA tools are expected not to be used at their full potential and would continue to cover only the MARPOL Annex I-II discharges.

[174] EU Reference Scenario 2020 (europa.eu)
[175] https://knowledge4policy.ec.europa.eu/foresight/tool/megatrends-hub_en#explore
[176] COM(2022) 289 final.
[177] 2021 Strategic Foresight Report | European Commission (europa.eu)

EU policy developments

Building on the EU Reference scenario 2020, the baseline scenario for this impact assessment has been designed to include the initiatives of the 'Fit for 55' package[178].

The Baseline scenario assumes no further EU level intervention on ship-source pollution discharged to the sea beyond the current SSP Directive. It accounts for the effects of the recent entry into force of the revised Port Reception Facilities Directive (PRF)[179] and the proposal for the revision of the Environmental Crime Directive (ECD) that is in the process of being discussed by the European Parliament and the Council.

The revised PRF Directive had to be transposed by Member States by June 2021[180]. This means that its effects may be expected to manifest gradually in the early years of the baseline. The Directive foresees the development and improvement of new and existing Port Reception Facilities across EU ports aiming to provide sufficient infrastructure for ships to deliver their waste instead of discharging it in the sea. The incentive to deliver waste to port reception facilities is provided by the obligatory indirect payment of a fee by ships regardless of the amount of waste the ship intends to dispose of and giving them the right to leave their waste in PRFs. This scheme of indirect fees is expected to take away, at least part of, the financial incentive of ship operators to illegally discharge waste at sea. This would likely result in a reduction of illegal discharges at sea, somewhat closing the gap of deliveries of waste to PRFs compared to the totally generated waste[181].

The 2021 proposal for a new Environmental Crime Directive (ECD) includes, inter alia, provisions on the definition of criminal offences, more effective sanctions for both natural and legal persons and strengthening the enforcement chain to facilitate work on investigation, prosecution and adjudication. In view of Article 83 (2) TFEU being the new legal basis for criminal law measures at EU level and for reasons of consistency, the ECD proposal transfers the description of the criminal offence from the SSPD to the ECD. This will ensure that tackling illegal ship-source pollution benefits from a stronger legal framework on combating environmental crime.

The baseline assumes no change in the EMSA founding regulation and its role in the area of maritime surveillance, notably the operation of the CleanSeaNet service and the issuing of alerts to Member States on possible illegal discharges for Annex I and II, which the authorities may choose to follow up by inspecting a ship in port or on-site verification. No change is either foreseen in other relevant activities performed by EMSA, such as the organisation of trainings and the preparation of guidance documents.

Furthermore, the current Dynamic Overview of National Authorities (DONA) and the Integrated Maritime Services are progressively giving new opportunities for data collection and exchange on ship-source pollution, which should also contribute to enhancing enforcement capabilities of Member States.

In the baseline scenario, the scope of the Directive will remain limited to **MARPOL** Annex I and Annex II. Furthermore, it is expected that there will be no change to the scope of

[178] Delivering the European Green Deal | European Commission (europa.eu)
[179] Directive (EU) 2019/883
[180] All EU Member States, with the exception of Hungary (a landlocked country), had by that date transposed relevant legislation.
[181] As identified in the problem definition section.

MARPOL in terms of the substances it regulates within Annex I and II and there will be no major change to any international provisions related to limit values or additional reporting activities in the future. Consequently, the scope of the Directive, in the context of substances it regulates, can be expected to remain the same. Nevertheless, it is likely that other pollutant substances that are currently drawing more attention, such as plastic pellets, might be added in the future in other (relevant) MARPOL Annexes such as Annex III or V. However, this development does not affect the baseline in which the scope of the SSP Directive remains limited to Annex I and II.

Baseline scenario results

Maritime traffic projections

The COVID-19 pandemic had a major impact on global shipping, affecting all its segments from passenger ships to container ships and oil tankers. In the baseline scenario, international maritime freight transport activity (intra and extra-EU) is projected to be 21% lower in 2020 relative to 2015. From 2021 onwards however it is projected to start recovering and grow strongly by 2025 and beyond (i.e. 19% growth for 2015-2030 and 48% for 2015-2050), due to the rising demand for primary resources and container shipping. Relative to 2019, this is equivalent to 8% increase in transport activity by 2030 and 33% growth by 2050.

The number of port calls for 2025-2050 is projected to grow at a lower rate than transport activity, following similar evolution over the historical period[182]. This reflects the fact that transport activity is also driven by other factors such as the increase in the size of vessels over time, and of the distance travelled. In the baseline scenario the number of port calls is projected to go up by 14% by 2030 relative to 2015 and by 36% by 2050 (equivalent to 6% growth by 2030 relative to 2019 and 26% increase by 2050), following the recovery from the COVID-19 pandemic.

Illegal discharge of ship-source pollution

Table 21 summarises the factors affecting the total number of illegal discharges in the baseline providing a qualitative assessment of their relevance.

Table 21. Factors affecting the expected development of illegal discharges in the baseline scenario

	Factor	Future development
1	Development of maritime traffic	A steady increase in maritime traffic is expected to lead to an increased number of illegal discharges in the long term.
2	EU policies	The revised PRF Directive will induce a reduction in the total number of illegal discharges over time by offering infrastructure and incentive for ships delivering waste to Port Reception Facilities. The ECD revision could also contribute to developing an enhanced enforcement approach by Member States for environmental crime.
3	Market developments (environmental awareness)	The increasing importance of tackling environmental degradation is expected to drive the steady uptake in the use of more sustainable practices by the shipping sector due to reputation damage risks.
4	Technological developments (surveillance capabilities)	Improved surveillance tools (including satellite surveillance) for MARPOL Annex I and II substances will increase the deterrent effect to potential offenders for Annex I and II substances. No impact is expected for Annex III to VI substances as no surveillance tools by EMSA are

[182] The same ratio between the growth in the number of port calls and the transport activity as for the historical period (2014-2019) has been assumed for the projection period.

	Factor	Future development
		foreseen in the baseline scenario.

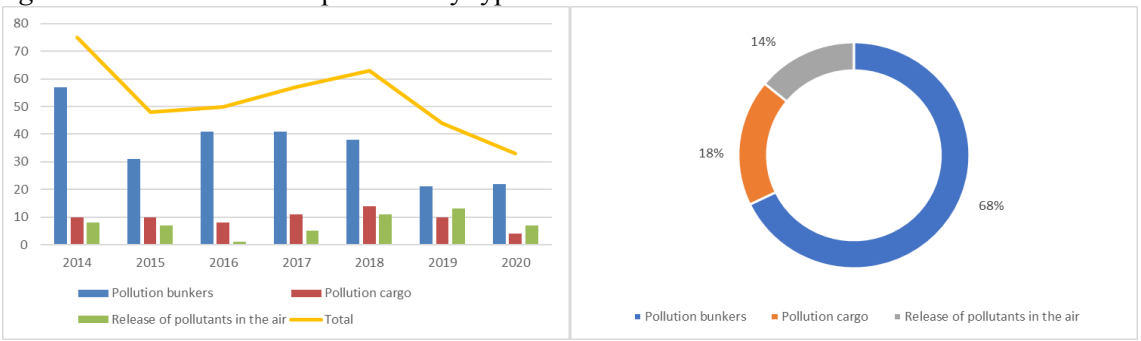
The combination of the above factors leads to different developments across the different categories of illegal ship-source pollution substances. In particular, a distinction needs to be made between substances that are currently in the scope of the SSP Directive (Annex I and II) and those that are not in the scope (Annexes III-VI). This is because the surveillance capabilities are expected to affect these two groups differently. More details are provided below.

- Oil (MARPOL Annex I)

The current Directive addresses oil (Annex I) which is the main pollution identified in statistics on marine casualties and incidents.

A total of 370 cases of marine pollution have been reported during 2014-2020, showing a decreasing trend over time. Marine pollution in the form of ship bunkers (fuel) and other pollutants (e.g. cargo residues) represented 68% and 18%, respectively, of the total number of cases of pollution (Figure 17)[183].

Figure 17. Cases of marine pollution by type



Source: European Maritime Safety Agency (2021)

However, accidental oil discharges represent a small part of the total illegal discharges covered in the SSP Directive. Most discharges are intentional/operational and not resulting from major accidents. The impact assessment accompanying the PRF Directive[184] provided an estimate of the total volume of illegal discharges, based on the estimation of the gap between the volumes of waste legally delivered to port reception facilities (PRF) and the estimation of the total waste generated by shipping activities. For Annex I oil waste, it showed a delivery gap - in absolute volume, of 31,000 m^3/year (approximately 27,280 tonnes), corresponding to 2.5% of total estimated waste generation. In this context, operational pollution is reported to represent the main source of oil pollution, despite the relatively small size of these spills (less than seven tonnes).

A relative stabilisation in the total number of illegal discharges is projected in the baseline scenario by 2050, despite the significant increase in maritime traffic. This is the result of a combination of factors, including in particular improvements in surveillance capabilities

[183] European Maritime Safety Agency (2021), Annual overview of marine casualties and incidents 2021.
[184] https://eur-lex.europa.eu/resource.html?uri=cellar:727908e7-fac7-11e7-b8f5-01aa75ed71a1.0001.02/DOC_1&format=PDF

(supported by the CleanSeaNet) due to technological developments, a small increase in the number of infringements identified, technological developments allowing for the treatment of waste on-board ships (such as more efficient oil-water separators), operational improvements (such as the increased use of PRFs to collect waste/polluting substances), policies in place (PRF Directive and EDC) and increased environmental awareness.

The shipping industry acknowledges the improved surveillance capabilities brought by satellite surveillance services and further potential future technological improvements. Seven of the 12 Member State authorities interviewed[185] agreed that technological developments, in particular those related to pollution detection, are expected to have a moderate to a significant positive impact on the level of discharges of polluting substances. For example, the Belgian authorities indicated that innovative detection technologies are already being deployed in EU Member States and should these technologies be introduced in other Member States, the improvement would be higher. Still, the French authorities consider that more research and development in technological means for the detection of polluting substances are needed. The resulting perceived risk of getting identified as a polluter can be seen as another motivating factor for the long-term improvement in the industry performance.

Increased environmental awareness leads shipping companies to gradually adopt improvements aiming to enhance their environmental performance also in order to fulfil social corporate responsibility goals. Representatives of the shipping industry[186] consulted in the context of the evaluation and impact assessment support studies reflected this point as a factor for improving the performance of ship operations. Moreover, segments of the shipping industry directly dealing with consumers (such as the ferry and cruise companies) would be further motivated by the risk of negative publicity, more directly affecting their business.

The view that the above-mentioned factors would lead to a potentially small decrease in the level of illegal discharges is supported by 12 out of the 26 stakeholders that responded to the relevant interview question[187]. On the other hand, the representatives of REMPEC stated that in the absence of intervention at EU level there would not be a drive for major changes such as market developments or technological development, but "it is the presence of EU action that will drive change". The IMO voiced concerns that "illegal discharge will get worse based on the assumption that there will be more maritime traffic", a point which was echoed in the position provided by Seas At Risk "if the market continues to grow then you can expect the problems to keep growing". Overall, six out of 26 stakeholders interviewed believed the situation would deteriorate[188].

- Noxious liquid substances (HNS) in bulk (MARPOL Annex II)

Marine chemical, hazardous and noxious substances spills (HNS) can be particularly harmful to the marine environment. International accident preparedness and response instruments have already been developed to monitor and control these types of accidents, such as the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and

[185] HR, CY, MT, NL, ES and 2 anonymous representative of Member State authorities
[186] ECSA (European Community Shipowners' Associations), I&P Clubs (Protection and Indemnity Clubs), ICS (International Chamber of Shipping) and BIMCO (Baltic and International Maritime Council)
[187] HR, CY, MT, NL, ES, 2 anonymous representative of Member State authorities, NSN, ECSA, ICS, BIMCO, IPTA
[188] FR, DE, REMPEC, IMO, Bonn Agreement, Seas At Risk

Noxious Substances (OPRC-HNS Protocol) that entered into force in 2007[189]. However, these spills are less frequent than oil spills[190] and, due to their infrequent nature, there is little quantitative data available to discuss emerging trends. While no instrument can guarantee the complete elimination of such pollution incidents, it is anticipated that these spills will remain limited in the baseline scenario.

- Harmful substances carried by sea in packaged form (MARPOL Annex III)

As for Annex III spills, illegal discharges of harmful substances in packaged form have an infrequent nature, and for this reason there is little quantitative data available to discuss emerging trends. The PRF Directive does not cover Annex III, as packaged goods are not categorised as waste and are usually not delivered in Port Reception Facilities. It is anticipated that these spills will remain limited in the baseline scenario.

- Sewage from ships (MARPOL Annex IV)

The impact assessment accompanying the PRF Directive[191] provided an estimate of the total volume of illegal discharges, based on the estimation of the gap between the volumes of waste legally delivered to Port Reception Facilities (PRF) and the estimation of the total waste generated by shipping activities. For Annex IV – sewage, it pointed to a delivery gap - in absolute volume, of 136,000 tonnes/year, corresponding to 10% of total estimated waste generation.

The impact assessment accompanying the PRF Directive indicates that, for merchant shipping, of the sewage that is to be delivered to ports, approximately 7-17% is not received by port reception facilities and potentially discharged illegally, affecting the marine environment. For the recreational and fisheries sector, while volumes of sewage generated are similar to those of the merchant sector, no data on delivery are available to assess whether the gap for these sectors is similar or, possibly, higher.

Projections have also shown an increase in the volume of vessels built for freight vehicle transport with passenger accommodation generating significant discharges of sewage. Estimates have shown that RO-PAX ships produce over 1,500 tonnes of nitrogen through sewage discharges. These figures rise during summer periods which is consistent with the increase in seaborne passengers over this period[192]. Pollution from sewage from ships (MARPOL Annex IV) is likely to increase proportionately to the maritime traffic, notably for RO-PAX ships[193] and cruise ships. The transport activity for these categories of ships is projected to increase steadily as tourist levels return to pre-pandemic levels (i.e. 25% increase for 2015-2030 and 56% for 2015-2050).

It should be noted that sewage is not in the scope of the SSP Directive in the baseline and therefore specific monitoring of sewage is not implemented by CleanSeaNet; albeit can be detected by CleanSeaNet. The potential extension of the scope of the Directive would deploy

[189] Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol), see https://www.imo.org/en/About/Conventions/Pages/ListOfConventions.aspx

[190] EMSA and EEA Report, 2021

[191] https://eur-lex.europa.eu/resource.html?uri=cellar:727908e7-fac7-11e7-b8f5-01aa75ed71a1.0001.02/DOC_1&format=PDF

[192] EMSA and EEA (2021), European Maritime Transport Environnemental Report 2021, Luxembourg: s.n.

[193] RO-PAX acronym refers to passenger roll-on/roll-off ships.

additional satellite resources in order to improve the detectability of substances other than those under Annexes I&II. Despite technological developments, which may reduce the costs of satellite monitoring services over time, very few Member States are expected to pursue such additional satellite monitoring services on their own. As shown by the evaluation report, the costs for Member States for procuring satellite images are estimated to be up to 7 times higher than the costs for EMSA. Thus, the technological developments are not expected to have a significant impact on sewage discharges, which are projected to grow in line with the maritime traffic in the baseline. Increasing environmental awareness is also expected to have limited impact.

- Garbage from ships (MARPOL Annex V)

The impact assessment accompanying the PRF Directive[194] provided an estimate of the total volume of illegal discharges, based on the estimation of the gap between the volumes of waste legally delivered to port reception facilities (PRF) and the estimation of the total waste generated by shipping activities. For Annex V garbage, showed a delivery gap - in absolute volume, between 61,000 and 301,000 tonnes/year, corresponding to 7% - 34% of total estimated waste generation.

Although land-based sources are dominant in generating marine litter, sea-based sources actively contribute to the problem with an estimated EU average 32% and values up to 50% for some sea basins. It is estimated that the fishing and recreational sectors are relatively large sea-based sources contributors, with shares of 30% and 19% respectively according to Eunomia (2016)[195]. Although garbage delivered in ports has increased since the introduction of the PRF Directive, a significant delivery gap thus remains.

It is likely that discharges of garbage will increase over time due to the trend in maritime traffic, even if an increasing share of the garbage is delivered in ports and behavioural changes reduce the garbage generation notably for cruise (e.g. reduction of single use plastics). Similarly to sewage, garbage is not in the scope of the SSP Directive in the baseline and therefore specific monitoring of garbage is not implemented by CleanSeaNet; albeit can be detected by CleanSeaNet. The potential extension of the scope of the Directive would deploy additional satellite resources in order to improve the detectability of substances other than those under Annexes I&II. The technological developments are not expected to have a significant impact on sewage discharges, which are projected to grow in line with the maritime traffic in the baseline. Increasing environmental awareness is also expected to have limited impact.

- Discharge water from scrubbers (MARPOL Annex VI)

For air pollution from ships (MARPOL Annex VI), legislation in place is expected to lead to a clear decoupling from shipping volumes and a reduction of the SO_x emissions released to the atmosphere by 32% by 2030 and 56% by 2050 compared with 2015[196]. Air emissions released to the atmosphere can be reduced to compliant levels through the installation of emission abating scrubbers.

[194] https://eur-lex.europa.eu/resource.html?uri=cellar:727908e7-fac7-11e7-b8f5-01aa75ed71a1.0001.02/DOC_1&format=PDF

[195] Eunomia (2016), Study to support the development of measures to combat a range of marine litter resources, s.l.: s.n.

[196] PRIMES-TREMOVE baseline scenario projections.

Discharges to water of residues from **scrubbers** installed on ships, or discharge water**,** containing polycyclic aromatic hydrocarbons (PAHs), particulate matter, nitrates, nitrites, and heavy metals including nickel, lead, copper, and mercury is expected to increase because the majority of scrubbers sold are systems operating in open loop which discharge wash waters and do not generate sludge. Estimates of volumes are, however, uncertain. Open-loop scrubber water discharges were estimated at 170 million m3 by 2019.[197] The discharge of waters from open-loop scrubbers installed on ships increased significantly after 2015 as a result of the new standards on the use of low-sulphur fuels (0.10 % m/m) in Sulphur Emission Control Areas (SECAs). In general, for Ro-pax ships and vehicle carriers, the increase was quite substantial. More increases may again be expected from 1 January 2020, after the introduction of further reductions in the sulphur limits in fuels used in non SECAs (0.50 % m/m).[198]

Projections of the rate of illegal discharges identified by surveillance activities

The main factor impacting the number of detected cases is the availability of relevant surveillance tools and specialised resources. In the baseline scenario it is projected that the ratio of potential illegal discharges identified would remain relatively stable over time following the full roll-out of the Sentinel-1 satellites in the 2015-2019 period and the exploitation of the effectiveness gains from the introduction of the CSN service. It is considered unlikely that Member States would try to replicate surveillance tools such as the CSN service[199].

Further, with regards to the deployment of aerial or other surveillance resources by Member States, Figure 18 presents the pre-existing trend indicating a slight decline in the amount of aerial resources committed by Member States to maritime environmental surveillance. However, it is uncertain whether this negative trend will continue especially considering the increasing environmental awareness, resulting in pressure for Member States to enforce environmental regulation. Thus, the reduction in the amount of aerial resources committed by Member States is likely to be offset by improvements in the effectiveness of using these resources, resulting in a stable level of effective surveillance in the future. The baseline considers the improvements in the effectiveness of using resources due to technological developments, drawing on foresight megatrends. This has also been observed with the exploitation of the effectiveness gains from the introduction of the CSN service.

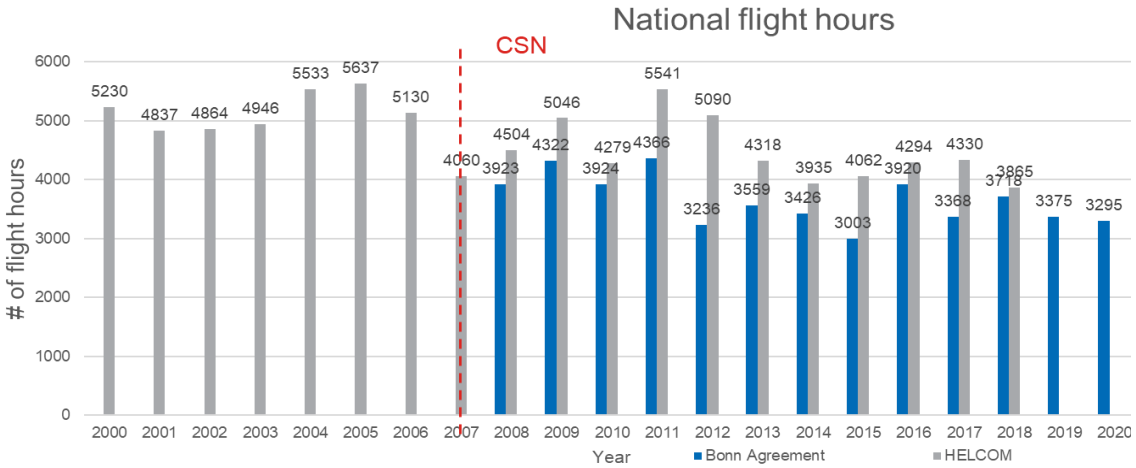
Such effectiveness gains would be grasped as a result of existing training and guidance activities provided by EMSA to Member States, and by their own potential initiatives to improve the effectiveness of the verification activities performed (e.g. verify pollution alerts within a certain time period). In the absence of further EU level action there is no indication that Member States would perform more verification activities than they currently do.

[197] STEAM (2021) 'Ship Traffic Emission Assessment Model', Finnish Meteorological Institute https://en.ilmatieteenlaitos.fi

[198] European Maritime Safety Agency and European Environment Agency, 2021, European Maritime Transport Environmental Report (EMTER)

[199] As identified in the Ricardo (2023), Evaluation support study, see Annex 7

Figure 18. Aerial surveillance activity in the North Sea and the Baltic Sea. The red dotted line marks the deployment of CleanSeaNet (CSN).



Source: Ricardo analysis based on HELCOM and Bonn Agreement annual reporting on aerial surveillance activities between 2000 and 2020

Prosecution of identified cases

A critical element necessary for the prosecution of a case, is the identification of the polluter (ship illegally discharging). This activity is currently supported by EMSA-developed tools, including vessel trajectories in SSN and backtracking tools. No change in the tools used for this is foreseen in the future in the absence of further EU level action.

The proportion of identified cases resulting in prosecution of the persons liable is also dependent on a number of factors. First, it is affected by the number of infringements identified. Only a small increase is expected in this area, which could also result in an indirect small increase in prosecutions. The rate of conversion of identified cases into prosecution cases cannot be easily estimated and would likely point to smaller proportional increase in this parameter compared to the expected increase in the number of illegal discharges identified.

An important factor affecting the capacity to prosecute a case is the clarity of the definition of infringements. Although no change is foreseen in the SSP Directive or the relevant national legal frameworks, the introduction of harmonised treatment of criminal sanctions for serious environmental offences by the proposed revision of the ECD may have a minor positive effect, improving clarity and facilitating the prosecution of cases.

Member State collaboration is crucial in achieving the prosecution of cases of cross-border relevance. The systems put in place by EMSA facilitates this collaboration. Although no change is foreseen to the EMSA systems used, Member States may continue developing cooperation also at a regional level through the already established Regional Sea Conventions.

Table 22 summarises the discussion regarding the expected development of the number of prosecutions of illegal discharges.

Table 22. Expected development of illegal discharges prosecuted in the baseline scenario

	Factor	Future development	Effect on the number of prosecutions of illegal discharges
1	Identified illegal discharges	Small increase in the number of identified discharges expected.	+/-
2	Clarity of definitions	The ECD-introduced harmonisation of criminal sanctions may help increase the prosecution of identified cases.	+
3	Identification of polluter	No change to existing capabilities expected.	no change
4	Member State collaboration	Collaboration to be continued through existing EU framework and Regional Sea Conventions.	+
5	Evidence collection process	Collaboration to be continued through existing EU framework and Regional Sea Conventions.	+

Source: Ricardo (2023), Impact Assessment support study; Note: "+" represents an increase and "–" represents a decrease.

Amount/level of penalties

No significant impact on the penalties applied by Member States for illegal pollution from ships is expected in the baseline scenario relative to the status quo. In lack of EU level action no change is foreseen in the scope of the persons liable for infringements and the level of penalties applied.

A range of views were expressed during the stakeholders' consultation, when asked to what extent they expect that ships illegally discharging polluting substances into the sea will face effective and dissuasive penalties in the future. 13 out of the 26 respondents indicated that they expect this to happen at a moderate, significant or large extent, and 8 out of the 26 respondents indicated that they expect this to happen 'to a moderate extent'. This is linked to the strive for continuous improvement of enforcement activities by Member States. The international PRF organisation EUROSHORE was amongst the stakeholders expressing the opposite view, stating that ships polluting will not face dissuasive penalties at all "if no further action is taken to improve harmonisation and coordination between Member States, the issues raised by the Directive will persist".

A change is however expected in the following years due to the proposed revision of the ECD. The resulting development in the prosecution framework is likely to improve the efficiency of prosecutions, resulting in a slightly more effective system. However, bearing in mind that there is already considerable diversity between Member States in their preferred approach, the impact might be rather small.

Table 23. Expected development of total cases subject to penalties in the baseline scenario

	Factor	Future development	Effect on the number of penalised illegal discharges
1	Total prosecuted illegal discharges	Small increase expected in the number of prosecutions.	+
2	Legal basis, liability scope and level of penalties	No change expected.	no change

	Factor	Future development	Effect on the number of penalised illegal discharges
3	Choice of prosecution route	Improvements in the process brought by the ECD revision.	+

Source: Ricardo (2023), Impact Assessment support study; Note: "+" represents an increase and "–" represents a decrease.

Reporting on pollution incidents

Currently, reporting on pollution incidents takes place to a very limited extend with only a handful of Member States submitting relevant reports. In the baseline scenario, it is unlikely that systems will be put in place across the EU to facilitate data collection and reporting to the Commission without further EU level action. However, it is probable that specific Member States upgrade their capabilities in this respect, aiming to reduce the total effort needed to report on pollution incidents. This would also mitigate the implications, in terms of administrative burden, from multiple overlapping reporting requirements. Thus a small increase in reporting tools may be expected.

Table 24. Expected development of total number of pollution incidents reported in the baseline scenario

	Factor	Future development	Effect on the number of pollution incidents reported
1	Total penalised illegal discharges	Small increase expected in the number of illegal discharges subject to penalties.	+
2	Availability of reporting tools	Only expected to be developed by some Member States to reduce their administrative burden.	+
3	Administrative burden of data collection	Mitigate the implications, in terms of administrative burden, from multiple overlapping reporting requirements.	no change
4	Administrative burden of consolidating reports from Member States	No change foreseen	no change

Costs for Member States administrations and EMSA

In the baseline scenario, the most significant costs generated by the Directive are related to the CleanSeaNet (CSN) services that are based on a state-of-art system for satellite surveillance. The costs for the CSN services are estimated at EUR 5.17 million per year by EMSA and projected to remain stable over time (in 2020 prices) in the baseline scenario.

Member States administrations are estimated to spend 80 hours per year for reporting on the implementation of the SSP Directive to the European Commission[200] in the baseline scenario. Assuming an average hourly labour cost of 39.8 EUR for professional, technical and scientific

[200] The reporting on the implementation of the SSP Directive to EC takes place every three years. For the purpose of the analysis, these costs are transformed into annual costs. This is because the main effort is related to the collection, preparation, adjustment and filling in the data in the right format to fulfil the reporting requirements. These efforts are mostly needed at the time of dealing with the CSN pollution alerts.

services at EU level (in 2020 prices)[201], the total reporting costs per Member State are estimated at EUR 3,144 and at the EU level at EUR 70,048. In addition, the costs for verifying the CSN service pollution alerts are estimated at EUR 105,470 for 2020 and are projected to remain stable over time[202]. Finally, the costs for submitting pollution incident reports (POLREPs) in SafeSeaNet and inspection requests issued through THETIS are estimated at EUR 13,000 per year from 2020 onwards in the baseline scenario. Thus, at EU level, total costs for Member States administrations are projected at EUR 188,518 per year by 2050 (in 2020 prices) in the baseline scenario.

3. IMPACTS ON COSTS BY POLICY MEASURE

This section explains the inputs used and provides the assessment on costs of the policy measures included in the policy options. The synergies between the measures included in the options are already captured in this section.

The estimation of the costs draws on the impact assessment support study[203], including input collected through desk research and stakeholder interviews during the impact assessment process, as well as on the CleanSeaNet database of EMSA. The presentation distinguishes between different stakeholders groups (national authorities, EMSA and the European Commission) and between one-off and recurrent (annual) costs, and provides the present value for 2025-2050 assuming a discount rate of 3%. The policy measures included in the policy options do not create new obligations for businesses and are thus not expected to have an impact on their costs.

PMc1 – Extend the scope of the Directive to polluting substances under MARPOL Annex III-V and to discharge water from scrubbers under MARPOL Annex VI and include a review clause to encompass future developments of the MARPOL Convention.

Adjustment costs for EMSA

The alignment of the Directive to MARPOL, by including in the scope illegal discharges to water of polluting substances of MARPOL Annex III-V and Annex VI residues from scrubbers, requires the provision of additional satellite monitoring services by EMSA to Member State authorities. The adjustment costs are estimated by EMSA at EUR 1.9 to 2.4 million for Annex III (annual recurrent costs), relative to the baseline, for the deployment of high and very high resolution radar and optical imagery (VHR), to follow relevant incidents. The estimation of costs is based on the assumed need to survey 80 incidents annually at a cost of EUR 24,000 to 30,000 per event.

Annex IV and V pollutants would already be detectable through the CleanSeaNet (CSN) service. However, the detection accuracy would benefit from additional medium resolution optical Sentinel-2 type monitoring and from increasing the monitoring volume. EMSA estimates that these upgrades to the CleanSeaNet and technological tools, namely operation of EMSA's Earth Observation Data Center would require an additional EUR 2.6 million

[201] Source: Eurostat [LC_LCI_LEV]

[202] These costs also include those related to the collection and the preparation of the relevant data for CleanSeaNet. They do not include surveillance activities (aerial or by other means) as these requirements are derived from international (i.e. MARPOL) and national legislation pre-existing the SSP Directive.

[203] Ricardo (2023), Impact Assessment of Directive 2005/35/EC on ship-source pollution

annually from 2025 onwards, relative to the baseline. These upgrades could also benefit the detection of substances under the current scope of the SSP Directive. In addition, nine full time equivalents would be needed by EMSA to support the provision of the additional satellite monitoring services, estimated at EUR 1 million per year from 2025 onwards. Additional technical support from EMSA to Member States, to support verification activities, could also take the form of remotely piloted aircraft systems (RPAS) operations. The number of operations performed annually would however depend on Member States interest in such type of system. As such type of support is not explicitly required by the SSP Directive and the interest by the Member States in such type of operations is not known at this stage, the RPAS operations are not included in the costs. Thus, the total adjustment costs for EMSA are estimated at EUR 5.5 to 6 million per year relative to the baseline from 2025 onwards. Expressed as present value over 2025-2050, they amount to EUR 101.6 to 110.5 million.

Enforcement costs for Member States administrations

The costs for verifying the CSN service pollution alerts are estimated at EUR 105,470 for 2020 and they are projected to remain stable over time in the baseline scenario. In addition, the costs for submitting pollution incident reports (POLREPs) in SSN and inspection requests issued through THETIS are estimated at EUR 13,000 per year from 2020 onwards in the baseline scenario.

In PMc1, the additional satellite monitoring services by EMSA are expected to result in an increase in the number of CSN service pollution alerts issued. When introducing the Sentinel-1 images, the number of pollution alerts generated by the CSN service increased by approximately 30% per year between 2015 and 2020, although the growth rate flatten out towards the end of the period. The increase in the CSN service pollution alerts due to PMc1 is however expected to be lower. This is because the substances of MARPOL Annexes VI and V are already identified to significant extent via the CSN service[204,205].

Assuming an annual average growth rate of around 8% for 2025-2030, following the implementation of PMc1, the total number of CSN alerts is projected to reach around 12,200 by 2030. This represents 58% increase in the CSN alerts in 2030 relative to the baseline, or 1,530 additional verified alerts. Post-2030, the increase in the number of pollution alerts is projected to remain stable relative to the baseline, based on the past experience of introducing the Sentinel-1 images. The share of verified CSN alerts in the total number of CSN alerts is assumed to remain unchanged over time, relative to 2020. Finally, the number of pollution incident reports submitted in SafeSeaNet (SSN) and the inspection requests issued through THETIS is assumed to increase in the same proportion with the CSN alerts, relative to the baseline.

The time needed to verify each CSN pollution alert is estimated at one hour[206] in the baseline scenario and it is assumed to be the same in the policy options. To estimate the costs for verifying the additional CSN pollution alerts, an average hourly labour cost of 39.8 EUR has been assumed for professional, technical and scientific services at EU level (in 2020 prices)[207]. Thus, the additional costs for Member States administrations for verifying the

[204] Sewage and garbage are included in a broader cluster (together with fish, vegetable oils and other) that represent 31% of total CSN service potential detections.

[205] European Maritime Safety Agency and European Environment Agency, 2021, European Maritime Transport Environmental Report (EMTER)

[206] The median value was used of the estimations provided by BG, CY, FR, PL and RO.

[207] Source: Eurostat [LC_LCI_LEV]

additional CSN pollution alerts are estimated at EUR 8,323 in 2025 and EUR 60,894 from 2030 onwards, relative to the baseline[208]. The additional costs for submitting pollution incident reports in SSN and inspection requests issued through THETIS would amount at EUR 1,026 in 2025 and EUR 7,597 from 2030 onwards, relative to the baseline. Expressed as present value over the 2025-2050 period, enforcement costs for Member States administrations are estimated at EUR 1.1 million for PMc1 in all policy options, relative to the baseline.

The enforcement costs savings for verifying the CSN pollution alerts and the pollution incident reports and inspection requests issued through THETIS, due to the integration of data exchange tools (as foreseen in PMc5), are discussed under PMc5.

Table 25. Enforcement costs for Member States authorities (in million EUR) for PMc1, expressed as present value over 2025-2050, relative to the baseline

	Difference to the baseline		
	PO A	PO B	PO C
CSN feedback reports	1.0	1.0	1.0
Extension of obligation to issue pollution incident reports (POLREPs) and THETIS inspection requests	0.1	0.1	0.1
Total enforcement costs	**1.1**	**1.1**	**1.1**

Source: Ricardo (2023), Impact assessment support study

PMc2 - EMSA provides training and guidance to authorities responsible for detection, verification and evidence collection.

Adjustment costs for EMSA

In PMc2, the costs for the development of two guidance documents[209] are estimated at EUR 200,000 per guidance document, or EUR 400,000 in total relative to the baseline in 2025 (one-off costs). In addition, costs of EUR 80,000 per year are foreseen from 2026 onwards for providing regular updates to the two guidance documents, in consultation with Member State authorities. PMc2 also foresees training on detection to facilitate evidence gathering for ship-source offences to authorities responsible for verification and prosecution. The adjustment costs for EMSA are estimated at EUR 100,000 one-off costs for preparing the training session in 2025, and EUR 50,000 recurrent annual costs for the reimbursement of participants from 2025 onwards, relative to the baseline. These costs estimates, provided by EMSA, are based on past similar projects and training sessions. Expressed as present value over 2025-2050, the adjustment costs for EMSA relative to the baseline are estimated at EUR 2.8 million for PMc2 (of which EUR 0.5 million one-off costs in 2025). The costs associated to PMc2 are the same in all policy options.

[208] These costs also include those related to the collection and the preparation of the relevant data for CleanSeaNet. They do not include surveillance activities (aerial or by other means) as these requirements are derived from international (i.e. MARPOL) and national legislation pre-existing the SSP Directive.

[209] One focusing on "Tools for gathering evidence and types of evidence used" and the other on "Monitoring and detection tools".

Table 26. Adjustment costs for EMSA (in million EUR) for PMc2, expressed as present value over 2025-2050, relative to the baseline

	Difference to the baseline		
	PO A	PO B	PO C
Development and update of guidance documents	1.8	1.8	1.8
Development of guidance documents (one-off costs)	*0.4*	*0.4*	*0.4*
Update of guidance documents (recurrent costs)	*1.4*	*1.4*	*1.4*
Development and organisation of annual training sessions	1.0	1.0	1.0
Development of a training session (one-off costs)	*0.1*	*0.1*	*0.1*
Organisation of training sessions (recurrent costs)	*0.9*	*0.9*	*0.9*
Total adjustment costs for EMSA	2.8	2.8	2.8

Source: Ricardo (2023), Impact Assessment support study

PMc3 - The Commission establishes a dedicated expert group facilitating cooperation between Member States, including through the adoption of guidelines.

Adjustment costs for the European Commission

In PMc3, one meeting per year is assumed to be organised by the Commission in person, to exchange lessons learned and enable cooperation between Member States. The costs are estimated at EUR 30,000 per year on average for the reimbursement of participants, from 2025 onwards relative to the baseline. Expressed as present value over 2025-2050, the adjustment costs for the Commission relative to the baseline are estimated at EUR 0.6 million for PMc3. The costs are the same in all policy options.

PMc4 – Inclusion of a provision on whistle-blowers, their protection and means of passing the relevant information.

Adjustment costs for EMSA

This measure concerns the development of a public communication channel for whistle-blowers, to submit information in an anonymised way. The adjustment costs are estimated by EMSA at EUR 50,000 for the development of the module to the new analytical platform (one-off costs in 2025) plus EUR 10,000 per year from 2026 onwards, for its maintenance. Expressed as present value over 2025-2050, the adjustment costs for EMSA relative to the baseline are estimated at EUR 0.2 million in PMc4. The costs are the same in all policy options.

PMc5 – EMSA further enhances the data exchange tools and automated links in the Integrated Maritime Services based on CleanSeaNet, THETIS, THETIS EU and SafeSeaNet.

Adjustment costs for EMSA

In PMc5, included in all policy options, the integration and enhancement of the data exchange tools and the development of automated links in the Integrated Maritime Services based on CleanSeaNet, THETIS, THETIS EU and SafeSeaNet is expected to result in adjustment costs for EMSA. The costs for the integration of the data exchange tools are estimated by EMSA at EUR 2 million (one-off costs in 2025) and the maintenance costs at EUR 300,000 per year

from 2026 onwards, relative to the baseline. In addition, three full time equivalents would be needed by EMSA to support the development of the Integrated Maritime Services, estimated at EUR 330,000 per year from 2025 onwards. Expressed as present value over 2025-2050, the adjustment costs for EMSA relative to the baseline are estimated at EUR 13.3 million in PMc5 (of which EUR 2 million one-off costs) for all policy options.

Enforcement costs savings for Member States administrations

The integration of data exchange tools (as foreseen in PMc5) is expected to lead to a reduction in the time spent for verifying CSN pollution alerts, estimated at 30 minutes in all policy options, instead of one hour per alert in the baseline. Thus, PMc5 is estimated to result in enforcement costs savings for Member States administrations for verifying the CSN pollution alerts of EUR 56,897 in 2025 and EUR 83,182 from 2030 onwards. An average hourly labour cost of 39.8 EUR has been assumed for professional, technical and scientific services at EU level (in 2020 prices)[210].

PMc5 would also result in the near elimination of the costs for submitting pollution incident reports (POLREPs) in SSN and inspection requests issued through THETIS, leading to costs savings of EUR 14,026 in 2025 and EUR 20,597 from 2030 onwards relative to PMc1. Expressed as present value over the 2025-2050 period, enforcement costs savings for Member States administrations are estimated at EUR 1.8 million for PMc5 in all policy options.

PMc6 - The exception from liability for polluters, including crew members, will be further clarified in the Directive.

This measure, included in all three policy options, provides a clarification to the text of the Directive. It has no cost implications.

PMc7 - Obligation for Member States to log their feedback data in CleanSeaNet and document if and how CleanSeaNet alerts have been verified.

Enforcement costs for Member States administrations

This measure introduces the obligation for Member State authorities to provide feedback even for CSN alerts that are not followed-up. This could consist of a simple registration of the reason the CSN service pollution alert is not followed up. Such a requirement would result in an additional 5,449 feedback reports being compiled in 2025 and 8,020 feedback reports from 2030 onwards, also considering the extension of the scope in PMc1. The time for filling in a feedback report is estimated at 15 minutes. Assuming an average hourly labour cost of 39.8 EUR (in 2020 prices)[211], the enforcement costs for Member States authorities are estimated at EUR 54,213 in 2025 and EUR 79,799 from 2030 onwards relative to the baseline. Expressed as present value over the 2025-2050 period, the enforcement costs for Member States administrations are estimated at EUR 1.4 million for PMc7 in PO A, PO B and PO C.

[210] Source: Eurostat [LC_LCI_LEV]
[211] Source: Eurostat [LC_LCI_LEV]

PM1 – Inclusion of a provision on minimum requirements for verification by means of a national target of 60% verification rate for CleanSeaNet alerts.

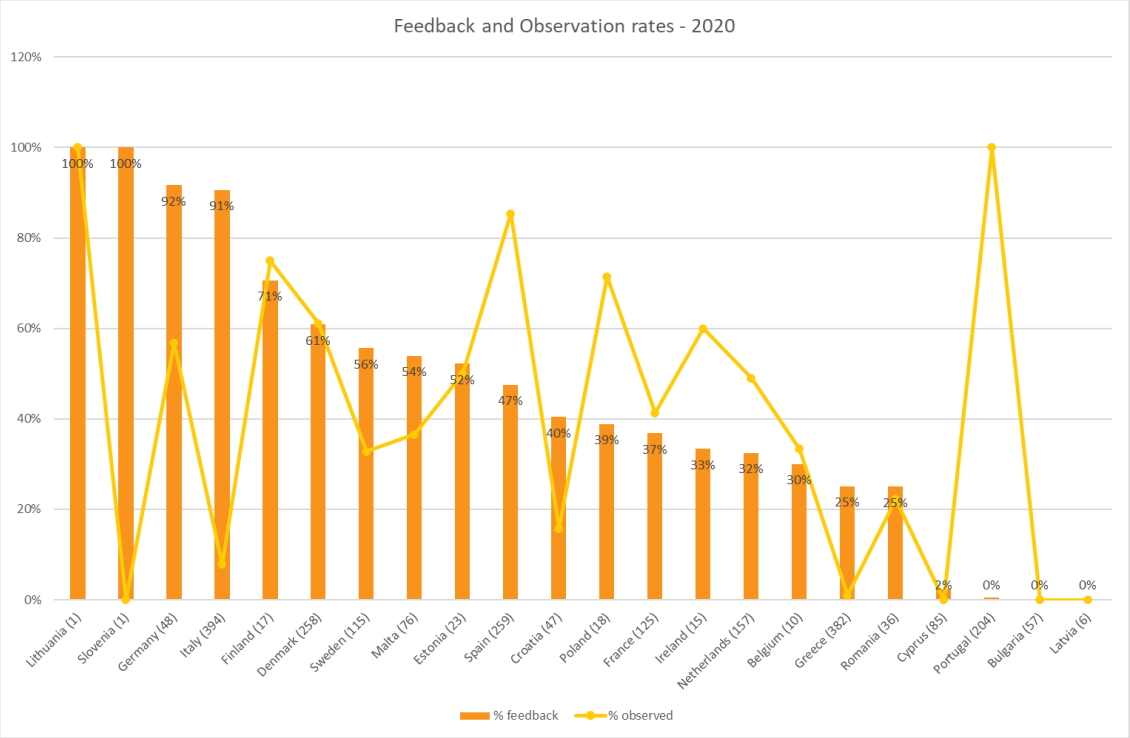
Enforcement costs for Member States administrations

When a Member State authority gets a CleanSeaNet alert, a decision is made whether to verify the alert (e.g. send an aircraft to the location indicated in the alert) or not. At EU level, the share of CleanSeaNet alerts verified on site was 45% in 2020. There are however significant differences between Member States[212]. In the baseline scenario, the shares at Member States level are assumed to remain constant over time relative to the 2020 levels.

At the same time, the number of CleanSeaNet alerts are projected to increase over time at the same rate as the overall detections, also considering the extension of the scope due to PMc1. Thus the number of detections is projected to go up by 58% by 2030 relative to 2020 and to stabilise post-2030.

In PM1, included in PO C, the provision on the minimum requirements on the verification by Member States of at least 60% of CleanSeaNet alerts would increase the effort put into verification activities. This is the case of all Member States, except for DE, DK, FI, IT, LT and SI, which already verify more than 60% of the detections in the baseline (see Figure 19 below). The increase in the number of verified CleanSeaNet alerts due to PM1, relative to the baseline, is provided in Table 27. At EU level, the increase is estimated at 528 for 2025 and 775 from 2030 onwards.

Figure 19. Percentage feedback on Class A alerts[213] and % actual observed events



[212] Latest News - Detections & Feedback data - EMSA - European Maritime Safety Agency (europa.eu)

[213] Class A alerts are CleanSeaNet alerts of higher confidence level based on a semi-automates check of satellite images by the service provider. The confidence level is set based on AIS (Automatic Identification System) data, shape and contrast of the detection, wind and sea state information and other ancillary information like bathymetry, platforms and wrecks layers.

Table 27. Increase in the number of verified CleanSeaNet alerts due to PM1, relative to the baseline

	2025	2030	2050
Belgium	4	5	5
Bulgaria	37	54	54
Croatia	10	15	15
Cyprus	53	77	77
Denmark	0	0	0
Estonia	2	3	3
Finland	0	0	0
France	31	46	46
Germany	0	0	0
Greece	143	212	212
Ireland	5	6	6
Italy	0	0	0
Latvia	4	4	4
Lithuania	0	0	0
Malta	5	7	7
Netherlands	46	68	68
Poland	4	6	6
Portugal	131	192	192
Romania	13	20	20
Slovenia	0	0	0
Spain	35	52	52
Sweden	5	8	8
EU	528	775	775

Source: Ricardo (2023), Impact Assessment support study

Data collected from three Member States[214] during the stakeholders' consultation, pointed to an average cost of approximately EUR 5,000 per hour for an aerial verification. On average, an aerial verification is estimated to take 3 hours.

The additional enforcement costs for Member States administrations, relative to the baseline, are estimated at EUR 7.9 million in 2025 and EUR 11.6 million from 2030 onwards. The additional costs by Member State are provided in Table 28. Expressed as present value over the 2025-2050 period, the enforcement costs for Member States administrations are estimated at EUR 202.7 million for PM1 in PO C.

Table 28. Enforcement costs for Member States administrations due to PM1, relative to the baseline (in thousand EUR)

	2025	2030	2050
Belgium	60	75	75
Bulgaria	555	810	810
Croatia	150	225	225
Cyprus	795	1,155	1,155
Denmark	0	0	0
Estonia	30	45	45
Finland	0	0	0
France	465	690	690
Germany	0	0	0
Greece	2,145	3,180	3,180

[214] Average cost per aerial verification (sending aircraft to the location indicated in the alert) based on data provided by Poland, Germany and Finland.

	2025	2030	2050
Ireland	75	90	90
Italy	0	0	0
Latvia	60	60	60
Lithuania	0	0	0
Malta	75	105	105
Netherlands	690	1,020	1,020
Poland	60	90	90
Portugal	1,965	2,880	2,880
Romania	195	300	300
Slovenia	0	0	0
Spain	525	780	780
Sweden	75	120	120
EU	7,920	11,625	11,625

Source: Ricardo (2023), Impact Assessment support study

PM2a - Each Member State defines in their national legal order the components of infringements, either on the basis of 'minor cases' and 'deterioration of the quality of water', or on any other basis prescribed by the Directive, and applies administrative or criminal penalties accordingly.

This measure, included in PO A, does not entail an impact on costs.

PM2b – The Directive provides definitions of the components of infringements, either on the basis of 'minor cases' and 'deterioration of the quality of water' or on any other basis prescribed by the Directive.

This measure, included in PO B and PO C, does not entail an impact on costs.

PM3a – The principles for setting the level of administrative penalties will be included in the Directive and the Commission will develop an implementing act on the criteria for and the minimum levels of administrative penalties in order for the Member States as to apply proportionate penalties.

PM3a requires developing an implementing act on the criteria for administrative penalties for Member States as to apply proportionate penalties. The adjustment costs relative to the baseline for the Commission are estimated at EUR 200,000 (one-off costs in 2025), including the development of an implementing act for penalties setting and consultation of the Member States. The cost assumption is based on guidance documents developed by EMSA in this area.

PM3b – The Directive provides principles for setting the level of administrative penalties. The Commission will develop an implementing act on the criteria to be applied (e.g. depending on type of polluting substances).

In PM3b, the principles, criteria as well as values for ensuring that an identified violation is subject to proportionate penalties are set. This measure is not expected to entail an impact on costs.

PM4 – Obligation for Member States to report their data in an EMSA-managed tool on each ship-source pollution incident.

Adjustment costs for EMSA

This measure concerns the development and maintenance of a new reporting tool. The adjustment costs for EMSA relative to the baseline, drawing on similar projects, are estimated at EUR 250,000 one-off costs in 2025 for the development of the tool and EUR 180,000 recurrent annual costs for the maintenance of the tool from 2026 onwards. Expressed as present value over 2025-2050 the adjustment costs relative to the baseline are estimated at EUR 3.4 million (of which EUR 0.3 million one-off costs) in PO B and PO C.

Administrative costs savings for Member States administrations

In the baseline scenario, Member States authorities are estimated to spend 80 hours per year for reporting on the implementation of the SSP Directive to EC[215]. Assuming an average hourly labour cost of 39.8 EUR (in 2020 prices)[216], the total reporting costs per Member State are estimated at EUR 3,144 and at the EU level at EUR 70,048.

In PM4, the development of the dedicated EMSA analytical tool for data collection and exchange would lead to significant time savings for reporting, which are estimated to be reduced by a factor of three. Thus, the administrative costs savings for Member States administrations are estimated at EUR 46,699 per year. Expressed as present value over the 2025-2050 period, the administrative costs savings for Member States administrations are estimated at EUR 0.9 million for PM4 in PO B and PO C.

PM5a - Member States inform the public about ship-source pollution incidents through a national website. Member States may also report this data to the Commission.

Adjustment costs for Member States administrations

In PM5a, the cost for developing a website for a Member State (to present information on ship-source pollution events to the public) is estimated at EUR 100,000 in 2025 (one-off adjustment costs), while the maintenance costs are estimated at EUR 25,000 from 2026 onwards relative to the baseline. At the EU level, the adjustment costs are estimated at EUR 2.3 million in 2025 for developing the 23 national websites[217] plus EUR 0.58 million recurrent annual costs to maintain them. Expressed as present value over 2025-2050 the adjustment costs for Member States administrations relative to the baseline are estimated at EUR 12.3 million (of which EUR 2.3 million one-off costs) in PO A.

[215] The reporting on the implementation of the SSP Directive to EC takes place every three years. For the purpose of the analysis, these costs are transformed into annual costs. This is because the main effort is related to the collection, preparation, adjustment and filling in the data in the right format to fulfil the reporting requirements. These effort are mostly needed at the time of dealing with the CSN pollution alerts.

[216] Source: Eurostat [LC_LCI_LEV]

[217] All Member States would have need to develop such website, except for AT, CZ, HU and SK that currently do not have flagged vessels.

PM5b – EMSA publishes online key EU information reported by Member States about ship-source pollution incidents.

Adjustment costs for EMSA

The adjustment costs relative to the baseline are estimated by EMSA, based on similar projects, at EUR 100,000 (one-off costs) in 2025 for developing the website and EUR 65,000 (recurrent annual costs) from 2026 onwards for maintenance. The website would draw inputs from the new analytical tools developed to collect Member States inputs. Expressed as present value over 2025-2050 the adjustment costs for EMSA relative to the baseline are estimated at EUR 1.2 million (of which EUR 0.1 million one-off costs).

4. BENEFITS IN TERMS OF AVOIDED ILLEGAL SHIP-SOURCE POLLUTION

Due to serious data limitations a quantitative assessment was only possible for PMc1 (the extension of the scope of the Directive) in relation to oil discharges. This is complemented by a qualitative assessment of the impacts of the other measures, included in section 6.3. It should also be noted that there is significant uncertainty regarding the quantitative assessment of the impacts of PMc1, due to serious limitations in the data availability and limited stakeholder input received during the consultation activities. For this reason, the assessment of the impacts of PMc1 in relation to oil discharges has been complemented by sensitivity analysis. This section provides more details on the assessment of the environmental benefits for PMc1.

The estimation of potential benefits is based on the assumed potential of the volume of oil illegally discharged prevented. In order to monetise the benefits, the potential volume of oil illegally discharged prevented is multiplied with the unit value of the external costs of such polluting substances.

The upgrades to CleanSeaNet in PMc1 is expected to also benefit the detection of substances under the current scope of the SSP Directive (i.e. oil). The amount of oil discharged in European seas by 2015 was estimated at 31,000 m^3/year[218], i.e. approximately 27,280 tonnes. In the baseline scenario, the oil discharged in European seas is projected to remain stable over time. According to a study commissioned by the European Parliament[219], the external cost of a discharge of a tonne of oil in the sea amounts to approximately EUR 290,000[220]. The same report indicates that only 0.22% of all external costs of oil substances discharged can be attributed to permitted oil spills, suggesting that the majority of the external costs are a result of illegal discharges[221].

[218] European Commission (2018). Commission staff working document, Impact Assessment on port reception facilities for the delivery of waste from ships

[219] https://www.europarl.europa.eu/RegData/etudes/note/join/2007/379227/IPOL-TRAN_NT(2007)379227_EN.pdf

[220] This value, expressed in 2020 prices, corresponds to the unit damage cost caused by one ton of oil discharged in the sea. The unit damage cost is independent of the evolution of the volume of oil discharges over the period 2007-2021 and over the assessment period of the policy options (2025-2050).

[221] It should be however highlighted that this estimation of external unit costs is based on limited data. The European Parliament study does not clarify what methodology has been followed and what are the exact external costs covered. Still the estimation of external costs related to human health and marine life can be highly dependent on the local context. Using a flat unit value does not account for the location of spills, which can essentially impact the total cost estimation.

PMc1 has an indirect impact on the reduction of illegal discharges. This is delivered through the dissuasive effect of improved surveillance and enforcement activities, more deterrent penalties and improved awareness of the environmental performance of the shipping industry, all eventually contributing to less pollutants being illegally discharged at sea. It is not straightforward to estimate the anticipated reduction of discharges of substances to the sea as a result of its implementation. However, a certain reduction can be expected as expressed in the stakeholder feedback during the stakeholders' consultation.

For the purpose of the assessment, a conservative central assumption has been used - namely, a reduction by 0.5% in the volume of oil waste discharges relative to the baseline from 2030 onwards. The reduction is gradually phased-in between 2025 and 2030, taking into account the growth in the number of CSN alerts verified in the policy options. PMc1 is included in all policy options and its impacts are expected to be the same in all options.

Sensitivity analysis has been additionally performed, to acknowledge the high level of uncertainty. Two additional cases have been considered, assuming 0.3% and 0.7% reduction in the volume of oil waste discharges relative to the baseline from 2030 onwards. As for the central case, the reduction is gradually phased-in between 2025 and 2030, taking into account the growth in the number of CleanSeaNet alerts followed up in the policy options. The estimated benefits upon the full roll-out of the CSN services in 2030, are provided in Table 29.

In the central case, assuming 0.5% reduction, 136 tonnes of oil waste discharges are expected to be prevented in 2030 leading to a reduction in the external costs of EUR 39.6 million in 2030 relative to the baseline.

Table 29. Potential environmental benefits for the policy options relative to the baseline, including sensitivity analysis, in 2030

	Volume reduction (in tonnes)	External costs reduction (in million EUR)
Benefits – 0.3% reduction	82	23.7
Benefits – 0.5% reduction (central case)	136	39.6
Benefits – 0.7% reduction	191	55.4

Source: Ricardo (2023), Impact Assessment support study

The 0.3% reduction case is expected to yield EUR 23.7 million benefits due to the reduction in the external costs in 2030 relative to the baseline. The 0.7% reduction case would lead to 191 tonnes of oil waste discharges prevented in 2030 and thus EUR 55.4 million benefits.

Over the 2025-2050 period, 3,411 tonnes of oil waste discharges would be prevented in the central case, 1,501 tonnes in the 0.3% reduction case and 5,320 tonnes in the 0.7% reduction case. The reduction in the external costs, expressed as present value over 2025-2050, is estimated at EUR 690.5 million in the central case, EUR 312.8 million in the 0.3% reduction case and EUR 1,068.3 million in the 0.7% reduction case.

Table 30. Potential environmental benefits for the policy options relative to the baseline, including sensitivity analysis, over 2025-2050

	Volume reduction (in tonnes)	External costs reduction (in million EUR)
Benefits – 0.3% reduction	1,501	312.8
Benefits – 0.5% reduction (central case)	3,411	690.5

	Volume reduction (in tonnes)	External costs reduction (in million EUR)
Benefits – 0.7% reduction	5,320	1,068.3

It should be noted that all estimates presented in this section can be regarded as very conservative, not least because the reduction in the external costs due to the discharges of other substances (MARPOL Annex II-VI) was not possible to quantify due to the lack of data. Since the surveillance activities for these substances have, up to now, not used dedicated surveillance tools (such as the CSN service used for Annex I substances) it can be expected that the deterrent effect of improved surveillance will be larger. This could translate into a potentially higher reduction of the total discharges of these substances compared to Annex I.

Annex 5 - Discarded policy options, policy measures and problem drivers

Annex 5 discusses the discarded problem drivers, policy measures and policy options and explains the reasons why they have been discarded.

Discarded problem driver

The Directive's scope does not cover air pollutants released into the atmosphere regulated by MARPOL Annex VI.

Background

In general, air pollution and water pollution require materially different approaches with regards to the regulatory framework suitable for their enforcement, mainly due to the different nature of these two types of pollution. As such, different enforcement mechanisms are in place in order to provide an implementable and dissuasive regime. This Directive is therefore not the right instrument to address the issue of air pollution from international shipping.

i. Different regulatory approaches when regulating continuous air pollution offences and one-off discharges into the sea

Waste from ships i.e. polluting substances are not discharged into the sea continuously, as is the case for air emissions. They do not need to be released to put the ship into motion and can be collected on board and delivered to ports. For this reason regulating and penalising illegal discharges into sea and emissions into air has always been different.

Air pollutants are emitted during ship operation at all times, through the normal operations of the vessels and engines as per their specifications. This "continuous nature" of air pollution distinguishes it from the "one-off" offences of water pollution. On the other hand, with water pollution, the effects of an illegal discharge to the marine environment are localised in terms of quantity and repercussions to the marine environment. The imminent and longer effects of illegal water pollution can be more accurately monitored, measured and sampled. As such, they can be attributed to a single polluter.

In light of the above, legislative efforts to date in order to combat air pollution have utilised different mechanisms other than penalising operational behaviour (i.e. the act of emitting). Under MARPOL, the act of emitting is not illegal or sanctionable per se. Air emissions are regulated through different means; 1) fuel standards (Regulation 14 – SOx), 2) engine standards (Regulation 13 – NOx) and operational indicators and 3) ship design parameters (Chapter 4 –Carbon Intensity), in order to regulate air emissions in the most efficient, effective and proportionate way. To implement these standards, a number of instruments are already in place, including 1) certification schemes, 3) surveys and 3) testing and sampling of fuels. These instruments are being enforced by flag States and are subject to Port State Control inspections. In light of the global nature of shipping, enforcement, based on documentation which always accompanies the ship, is more effective for targeted actors, as well as creates a level playing field.

Under EU legislation, the differentiation between air and water pollution is unequivocally accepted by promoting, e.g. fuel standards (Sulphur Directive), annual operational GHG intensity regulations (FuelEU maritime proposal), certification schemes (Renewable Energy Directive), monitoring and reporting of greenhouse gas emissions (EU MRV Regulation), and soon the surrendering of EU allowances for emissions from shipping companies (EU ETS proposal) and many other regulations. This way, the 'fair share' of responsibility to each operator is attributed, while also facilitating the setting of reduction goals for air pollution on a sectoral or cross-sectoral basis. Wherever air emissions can be tackled "at source", this avenue is preferred as cost-effective.

ii. Implementation of a penalty regime on operational behaviour as an effective way forward for regulating air emissions form international shipping

Penalties for illegal concentrations of pollutants in air due to emissions from ships are imposed based on a different regime than for pollution to the water. Fuel standards and engine standards provide evidence for non-compliance in a cost-efficient way. Such regime and administrative evidence is not effective for identifying a ship that intentionally discharged waste into the sea.

The continuous nature of air pollution perplexes the successful implementation of a system based on direct measurement of emissions. During a journey, a ship may switch between different fuels, change speed (which would affect the emissions emitted), enter and exit different emission control areas and State jurisdictions. Remote sensing, although a helpful implementation tool, has limitations in attributing air pollution to a single ship, especially in congested marine traffic routes. On the other hand, water pollution is identifiable by satellite surveillance and other aerial imagery. Its polluting effect is localised, making establishment of jurisdiction a more straightforward exercise. Discharges are more easily attributable to a single ship through e.g. "DNA-testing" between the substance discharged and the residues remaining in the ship's tanks during evidence collection.

Against this background, determining which penalties would be proportionate to be imposed to each polluter is not a straightforward exercise. Further, it cannot be guaranteed that these penalties will be dissuasive, since penalties would need to take into account the actual damage caused by each polluter, which might not reflect the gravity of the impact of the whole sector to the environment. The different mechanisms used for detecting air and water pollution, the jurisdictional limits imposed by UNCLOS and the different nature of pollution as such further demonstrate that this avenue would not be the most effective way forward to enforce the standards on air emissions established by MARPOL for the shipping sector.

It was therefore concluded that the SSP Directive could not be designed in a way that can facilitate its application for both air and water pollution in one instrument. The different nature of air and water pollution have led to different regulatory and enforcement mechanisms being adopted at international and EU level in order to effectively address these two diverse issues. UNCLOS constraints further hinder the design of a penalty regime for continuous offences based on operational behaviour.

<u>Discarded policy measures</u>

1. Extend the list of polluting substances covered by the Directive to include air emissions covered by MARPOL Annex VI (e.g. SOx, NOx, VOC, PM)

- ***Extend the list of polluting substances covered by the Directive to include air emissions of Sulphur Oxides (SOx) of MARPOL Annex VI***

Sulphur Oxides (SOx) emissions – MARPOL Annex VI Regulation 14

SOx emissions are regulated in the most cost-efficient way by fuel standards. For this reason, the EU has adopted the Directive (EU) 2016/802 and MARPOL has adopted Regulation 14. Extending the scope of the SSP to SOx air emissions would give overlaps and possible over-regulation or double punishment.

The approach adopted by MARPOL in Annex VI for the limitation of SOx air emissions is to limit the sulphur (S) content in fuel oil used or carried for use onboard a ship. Complying with the limits on S fuel content can be achieved either by using compliant fuel or through the use of SOx abatement technology (scrubbers), which reduce the content of SOx in the exhaust gases to a level equivalent to the level which would result when using compliant fuels.

The Sulphur Directive[222] (SD) transposes the fuel content standards in EU law and provides for penalties to non-compliant actors on the basis of sampling, analysis and inspection activities on the fuel carried on onboard (SD Article 13.2). These activities are usually undertaken by environmental or Port State Control inspectors when the ship is inspected in an EU port.

EMSA supports the enforcement of the SD by providing, amongst others, remotely piloted aircraft systems (RPAS) equipped with gas sensors (sniffers). RPAS can identify potentially non-compliant fuel by targeting a ship and flying over its funnel to measure SOx concentration in the exhaust gases.

The sanctionable act under the SD remains the carriage and use of non-compliant fuel, not the actual emissions emitted during the voyage. Whether a fuel is compliant or not is assessed at the time of sampling, not during engine combustion (where air pollution actually takes place).

The SD has an effective enforcement mechanism for sampling and reporting of SOx content in marine fuels, established under Implementing Decision 2015/253[223]. A dedicated database (THETIS-EU) has also been established for Member States to share information and findings on SOx inspections and alerts to potential non-compliance, as detected during RPAS operations. Compliance with applicable SOx standards in the EU has a very high compliance rate, with data from THETIS-EU providing for a 97% compliance rate of analysed fuel samples over the last five years. This compliance rate does not justify, from a subsidiarity and proportionality perspective, introducing additional penalties on a different basis in order to enforce the same standards and target the same actors.

Additional to the SD, a certification scheme for scrubbers and an obligation to monitor the discharged water from scrubbers already exists[224]. Regarding closed-loop scrubbers, the PRF Directive creates an obligation to discharge wash liquids; proceedings could take place if there is nothing to discharge. A fuel sample showing an abnormally high SOx level, could be the basis for starting proceedings (similar to Annex I cases on oil water separator).

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[222] Directive (EU) 2016/802 of the European Parliament and of the Council of 11 May 2016 relating to a reduction in the sulphur content of certain liquid fuels (OJ L 132, 21.5.2016, p. 58–78)

[223] Commission Implementing Decision (EU) 2015/253 of 16 February 2015 laying down the rules concerning the sampling and reporting under Council Directive 1999/32/EC as regards the sulphur content of marine fuels

[224] Under the 2021 IMO ECGS Guidelines, approval for the use of scrubbers can be based on either Scheme A or Scheme B. Scheme A involves installing a product with certified parameters and emission checks whilst Scheme B requires continuous measurements of emissions to demonstrate compliance.

Extending the scope of the SSP to SOx air emissions would overlap with existing EU law provisions and enforcement mechanisms in place, contributing to over-regulation, which could result in incoherent regimes. Furthermore, the inclusion of SOx emissions within the SSP Directive would result in double punishment.

Inclusion of SOx emissions under the SSP Directive would imply direct measurement of emissions of individual ships. Given the continuous nature of air pollution, sniffers would have to follow the ship throughout her journey in order to determine the quantity of illegal emissions released into the atmosphere. In the end, SSP penalties would have to be imposed on this basis in addition to those which could be imposed under the SD.

Furthermore, no type of regulatory gap has been identified between the implementation of the SSP Directive, SD and Environmental Crime Directive. Such expansion would further not deliver the Union's policy objectives in the simplest and most efficient way possible, taking also into account also the difficulty of establishing jurisdiction in continuous offences taking place in multiple jurisdictions.

- ***Extend the list of polluting substances covered by the Directive to include air emissions of Nitrogen Oxides (NOx) of MARPOL Annex VI***

NOx emissions – MARPOL Annex VI Regulation 13

Nitrogen Oxides (NOx) emission limits for international shipping are not regulated by EU legislation. The limitation of NOx emissions is based on an international regime[225] which applies to all Member States as parties to MARPOL and is based on engine standards.

MARPOL Annex VI sets a limit to air NOx emissions in terms of the mass (grams) of NOx emitted per unit of energy (kWh) delivered by the engine or engines on board. The limits apply to engine emission defined for standard test cycles.

Therefore, MARPOL established enforcement procedures based on the compliance with the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engine (NOx Technical Code)[226]. The code regulates engine testing, certification, and onboard verification procedures to demonstrate continuing compliance with the applicable NOx emissions limits. The engine certification process is normally conducted at test bed. The engine or engines can be fitted with complementary NOx abatement systems (mainly selective catalytic reduction (SCR) or exhaust gas recirculation (EGR)) to further reduce the NOx concentration.

This means that compliance with the emission limits at a particular moment in time cannot be ascertained on the basis measurements of NOx concentration in air i.e. in the exhaust gases only. The power being delivered by the engines at that moment would also be needed to determine if the standards are not being complied with. This would require real time simultaneous measurement of both the emissions and the power being delivered, something which is not feasible for enforcement purposes.

The enforcement of air NOx emissions is implemented through port state control inspections on the basis the engine certificate (EIAPP Certificate), the NOx Technical File and record

[225] https://www.imo.org/en/OurWork/Environment/Pages/Nitrogen-oxides-(NOx)-%E2%80%93-Regulation-13.aspx

[226] Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NOx Technical Code (2008)), as amended, Chapter 1, para 1.1.

books, showing maintenance records and changes to engines, including details of changeover when entering or exiting an emission control zone (ECA).

The inclusion of NOx air emissions under the scope of the SSP Directive would overlap with the existing enforcement procedures under port state control legislation. These procedures are effective since they can lead to the detention of a ship. Creating additional requirements for Member States to include non-compliance with the requirement of Regulation 13 in Annex VI would not be proportionate as it could create unnecessary administrative burden.

Moreover, although infringing for non-respect of the NOx technical code could be possible, it nevertheless falls outside the scope of ship-source pollution discharges. As such, it does not follow the logic of individual penalties for prohibited operational behaviour. It would imply the introduction of new standards applicable to individual behaviour, thereby departing from the logic of MARPOL Annex VI. This would not be in line with the Directive's legal purpose, enshrined in Article 1(1), which is to incorporate international standards for ship-source pollution unto EU law.

Extend the list of polluting substances covered by the Directive to include air emissions covered by MARPOL Annex VI other than SOx and NOx (e.g. VOC, PM)

VOC emissions – MARPOL Annex VI Regulation 15

For VOC emissions, MARPOL prescribes the minimum safeguards that each Administration should incorporate if they decide to set up their own national VOCs regulations (e.g. not to unduly delay ships while in port, safety standards to be taken into account while adopting VOCs regulation). Therefore, MARPOL does not establish any substantive standards that could be transposed in or enforced by EU law in this regard. Introducing new standards for VOCs emissions under the Directive would not be in line with the Directive's purpose.

Particulate Matter – MARPOL Annex VI Regulation 14

With regards to emissions of particulate matter (PM), MARPOL Annex VI regulates PM in tandem with SOx emissions under Regulation 14 of MARPOL Annex VI. There are no international standards set by MARPOL for the permitted concentration of PM during shipping operations. As such, inclusion of PM under the scope of the Directive would contravene its purpose, which is to transpose into EU law the already established international standards for ship-source pollution.

Carbon Intensity – MARPOL Annex VI Chapter 4

MARPOL Annex VI Chapter 4 provides for technical and operational measures to improve the energy efficiency of international shipping. Under Chapter 4, ships are attributed a rating based on their annual fuel oil consumption (Carbon Intensity Indicator) and must observe certain ship design parameters to improve their energy efficiency (Energy Efficiency Design Index and Energy Efficiency Existing Ship Index). These regulations are enforceable through survey and certification schemes, e.g. Energy Efficiency Certificate, Air Pollution Prevention Certificate, Statement of Compliance related to fuel oil consumption reporting and operational carbon intensity rating. The SSP Directive deals with the enforcement of international standards regulating polluting behaviour of operators, not the technical requirements of ships. Therefore, the SSP Directive is not the right tool to enforce Chapter 4 standards. The absence of certificates on board is already provided for by port State control.

2. Include a provision in the Directive on minimum requirements on the verification by Member States of possible illegal emission levels (SOx, NOx): national target of 20% verification level per Member State with reference to the number of possible illegal emission levels (SOx, NOx), detected in territorial waters and EEZ for which a THETIS EU/sulphur module alert was generated.

This measure would require Member States to validate alerts irrespective of whether the ship subsequently sails into their ports or not. The constraints imposed by UNCLOS regarding Coastal States enforcement powers on foreign flagged vessels navigating in the EEZ without subsequently entering their ports raises concerns regarding the added value of this measure. UNCLOS Art. 220(3) requires that investigation is permitted only where clear grounds exist that a violation took place and the investigation is limited to '*giving information regarding its identity and port of registry, its last and next port of call and other relevant information*'. In order to physically inspect the vessel, clear grounds that '*substantial discharge causing or threatening significant pollution of the marine environment*' must exist (Art. 220(5)). In view of the stringency of the wording of these provisions, jurisdiction for at-sea enforcement measures with respect to air emissions will generally be limited to certain basic information requests under UNCLOS Art. 220(3). Physical inspection, including on-board sampling of fuel would not be possible as the air emission by an individual ship is unlikely to meet the requirement of 'substantial discharge' and 'significant pollution' necessary under UNCLOS Art. 220(5). As such, there are doubts as to what the EU added value of such a measure would be in terms of achieving the EU political objective of combatting air pollution.

Additionally, there are doubts with regards to the effectiveness of the proposed measure. Some of the THETIS EU alerts are generated pursuant to RPAS/sniffers findings. For NOx, RPAS measurements have not been subject to major validation campaigns, therefore their accuracy is not yet verified. For SOx, RPAS measurements sometimes cannot be verified against the SOx levels of the same fuel measured in a laboratory. On the effectiveness of sniffers stationed in fixed spots, they may pick up false-positives in congested maritime traffic areas, thereby making identification of the polluter difficult. RPAS may rarely detect fuel residues from fuel used previously and not at the time of measurement, leading to a false positive. In light of the above, it was concluded that additional assessment was necessary regarding the effectiveness of THETIS-EU alerts on this basis, seeing that the proposed measure would entail extensive use of resources by Member States, which would be required to deploy patrol/coastguard vessels on site to verify the alert. Furthermore, seeing that RPAS are deployed by Member States and not in an EU-centralised manner, there is no mechanism that would systematically trigger such alerts, meaning that enforcement efforts will not be equally distributed amongst Member States.

The SSP Directive defines illegal discharges and subjects them to penalties. The proposed measure would require SOx and NOx emissions to be considered illegal under the SSP Directive, but could not impose any penalties on them. This is because penalties for SOx would be imposed under the SD while penalties for NOx could not be imposed, in the absence of underlying legislation. However, the Directive is not designed to collect information on potential illegal air emissions which would nevertheless remain immune to penalties under its provisions. Introducing a verification measure without prescribing penalties is not in line with the Directive's design and dilutes its purpose. By contrast, the SD already provides for penalties for illegal SOx emissions, provides the basis for the THETIS

EU alert system and the framework upon which national targets for SOx inspections are set[227].

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To sum up, the proposed measure was discarded due to technical and legal reasons and because it does not fit the design and purpose of the SSP Directive. Additionally, applicable UNCLOS provisions on State jurisdiction raise doubts as to the EU added value of such measure and its cost-efficiency.

3. Extend the list of polluting substances covered by the Directive beyond MARPOL covering pollution of emerging concern (e.g. underwater noise, plastic pellets, more strict than Annex V on animal carcasses or more strict than Annex III on lost containers)

Concerns of society about a variety of substances discharged into the sea affecting the marine environment are noted based on stakeholder input. There are stakeholder opinions that pollutants of emerging concern must be regulated in the EU in the first instance before regulated at international level. This way, the EU could be a front-runner and set high standards for pollutants not yet covered by international conventions. This policy measure has been discarded as it does not link to the Directive's purpose to incorporate international standards for ship-source pollution into EU law (Article 1(1) of the SSP Directive). Furthermore, including emerging polluting substances not yet regulated by MARPOL within the scope of the Directive was additionally determined to be premature.

If substances of emerging concern are added to MARPOL, it is proposed that a review clause is inserted in the Directive (PMc1), to the effect that the Commission should evaluate the need for extending the scope of the Directive to include more substances based on the future development of substantive standards by the IMO which fall under the remit of the Directive. This evaluation should at the same time consider the further strengthening of the relevant provisions of substances already covered by the Directive and make any appropriate legislative proposals to that effect.

Underwater radiated noise

Noise pollution is a by-product of shipping activities. Many commercial vessels emit low frequency noise that are damaging to marine environments and biodiversity. Noise pollution from ships has been an area of interest also for the IMO. In 2014, MEPC 66 approved guidelines on reducing underwater noise from commercial shipping to address negative effects on marine life[228]. The IMO work plan envisages that recommendations for the next steps could be submitted to MEPC 80 in 2023. This work includes identifying comparable and common means of measuring, analysing and reporting and revising the 2014 Guidelines. At EU level, threshold values are being developed in the framework of the MSFD, where underwater noise constitutes one of the descriptors for Good Environment Status. Nevertheless, underwater noise is not regulated by MARPOL and therefore does not fall in the scope of the SSP Directive. The inclusion of underwater radiated noise under the scope of

[227] Commission Implementing Decision (EU) 2015/253 of 16 February 2015 laying down the rules concerning the sampling and reporting under Council Directive 1999/32/EC as regards the sulphur content of marine fuels, Article 3(1).

[228] Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life, MEPC.1/Circ.833, 7 April 2014.

the Directive would contravene its purpose, which is to transpose into EU law the already established international standards for ship-source pollution.

Plastic pellets

Plastic pellets, also known as nurdles, are a type of plastic pollution and constitute the second largest source of primary microplastic emissions into the oceans. The IMO currently considers whether pre-production plastic pellets transported by sea should be classified as "harmful substances" under the International Maritime Dangerous Goods (IMDG) Code.[229] PPR 9, held on April 2022, instructed the Correspondence Group on Marine Plastic Litter from Ships to further consider the options for reducing the environmental risk associated with the maritime transport of plastic pellets. Nevertheless, plastic pellets are not regulated by MARPOL and therefore do not fall in the scope of the SSP Directive. The inclusion of plastic pellets under the scope of the Directive would contravene its purpose, which is to transpose into EU law the already established international standards for ship-source pollution.

Marine litter

Concerning plastic marine litter, the IMO adopted its 2021 Strategy to Address Marine Plastic Litter from Ships[230], setting the goal, amongst others, to reduce shipping's contribution to marine plastic litter. Nevertheless, plastic marine litter is not regulated by MARPOL and therefore does not fall in the scope of the SSP Directive.

Black carbon

With regards to **black carbon** emissions, work is currently ongoing in the IMO to establish the most suitable measurement method(s) and related sampling, measurement, reporting and calibration procedures, as well as to identify how to develop and apply threshold values. Nevertheless, black carbon is not regulated by MARPOL and therefore does not fall under the scope of the SSP Directive. With regards to the prohibition of use and carriage for use of Heavy Fuel Oil in the Artic, adopted by the IMO in its 76th session[231], the Directive does not extend to enforcing a fuel ban, unless it could result in prohibited oil discharges to the sea, falling under MARPOL Annex I.

Taking into account the lack of international standards on these substances, it was concluded that they cannot be regulated, for the first time and at this stage by the SSP Directive. Firstly, shipping is a global activity. As such, global standard-setting should be promoted to ensure a level-playing field and avoid distortion of global competition. Secondly, due to the lack of reliable on-scene detection instruments and common analysis and measuring systems to quantify the impact of each emitting activity on the environment, it was considered premature to include these substances under the scope of the Directive. Lastly, due to lack of data, mechanisms, standards and measuring instruments, it could not be confirmed that substantive standard-setting of these pollutants at this stage would constitute evidence-based policy-making. From a strategic foresight perspective, such policy choice would not be future-proof due to the anticipated development of standards at the international level, which, upon adoption, could cause re-structuring of the newly established framework, both from a

[229] IMDG Code is an international code for the maritime transport of dangerous goods in packaged form

[230] IMO Strategy to Address Marine Plastic Litter from Ships, Resolution MEPC 341(77), adopted on 26 November 2021.

[231] The IMO, in its 76th session adopted a prohibition of the use and carriage of oils, other than crude oils, having a density at 15°C higher than 900 kg/m3 or a kinematic viscosity at 50°C higher than 180 mm2/s, in Arctic waters.

substantive point and with regards to administrative organisation and resource allocation in the meantime.

4. Limit the extension of the scope of the Directive to align it with the scope of the waste categories of the PRF Directive

The reason for considering this measure was that the SSP Directive by design is complementary to the Port Reception Facilities (PRF) Directive. This measure implied full alignment in scope with the PRF Directive, which would mean not covering Annex III harmful substances carried by sea in packaged form. The PRF Directive does not cover Annex III because packaged goods are not categorised as waste and are usually not delivered in Port Reception Facilities. However, as they are transported by sea, it cannot be ruled that they could be illegally discharged to the sea. The alignment with the PRF Directive in terms of scope, thereby excluding from the scope of the SSP Directive jettisoning of Annex III packaged goods, is seen as insufficient and has been discarded. All substances illegally discharged into sea of MARPOL Annex I-VI are therefore taken into consideration for the purpose of this revision and included in all policy options.

5. Align the SSP Directive's legal regime with MARPOL Article 4(4)

There was a concern expressed by industry stakeholders that the co-existence of the international framework (UNCLOS and MARPOL) and the EU initiative (SSP Directive) brings legal uncertainty.

The legal coherence in light of MARPOL and UNCLOS was adjudicated in the European Court of Justice (ECJ) in the *Intertanko case*[232]. The Court ruled that the EU was not bound by MARPOL as it is not party to it and UNCLOS does not establish rules applicable directly to individuals. Therefore, the nature and the logic of UNCLOS prevented the Court from assessing the validity of the Directive against its provisions. The ECJ confirmed that serious negligence should be interpreted as '*an unintentional act or omission by which the person responsible commits a patent breach of the duty of care which he should have and could have complied with in view of his attributes, knowledge, abilities and individual situation'*. It ruled that Article 4 and 8 of the Directive do not infringe the principle of legal certainty, even though 'serious negligence' if left to Member States to define as a matter of national competence.

Even if the EU was bound by MARPOL thresholds, it is highlighted that MARPOL does not prescribe a general liability regime with regards to illegal discharges. It rather provides for a limited exception from liability only for discharges that have taken place due to damage to the ship or its equipment. The Directive transposes the relevant standards that make a discharge illegal and, with respect to the specific exemptions from liability, the Directive transposes the relevant MARPOL provisions through direct reference. This revision, together with the revision of the Environmental Crime Directive, allows EU to regulate in a more targeted manner the different legal regimes (administrative and criminal) existing in national legal orders, while maintaining the general liability regime first introduced by the SSP Directive for the attribution of polluting behaviour to the responsible offender for the purpose of imposing effective, proportionate and dissuasive penalties, either administrative or criminal.

[232] Judgment of 3 June 2008, *Intertanko*, C-308/06, ECLI:EU:C:2008:312, 2008, paragraph 15

Consequently, choosing to have a less strict liability regime for ship-source pollution prevention by prescribing solely that the penalties introduced pursuant to the Directive should only be 'adequate in severity to discourage violations' of MARPOL 'irrespective of where the violations occur' would lead to the weakening of marine environmental protection by not ensuring that penalties provided by the Member States should also be proportionate and effective, while taking into account the culpability of the responsible polluter .

To sum up, the approach adopted first by the Directive with regards to setting the liability scope at the threshold of serious negligence was ruled by the ECJ as neither infringing the principle of legal certainty nor MARPOL or UNCLOS provisions as such Therefore, restricting the scope of liability first introduced by the Directive was deemed unjustified and it was concluded that such liability scope should be maintained in the EU legal order. For the foresaid reasons, this policy measure has been discarded as not being in line with the ambitions of the European Green Deal, its zero pollution target and its Sustainable and Smart Mobility Strategy and the political will for legal action in relation to ship-source pollution.

Discarded policy option

Policy Option to repeal the Ship-Source Pollution Directive

A policy option of repealing the Directive has been analysed and put forward as it has been raised during stakeholder consultations. Some stakeholders see the notion of serious negligence in the Directive and the related criminalisation of natural persons (criminal liability aspects under Article 4 of the SSP Directive) as unfair treatment of crew. In this respect, it is argued that "serious negligence" is a lower threshold than in MARPOL, which (according to the argument) provides that, if there is not at least recklessness and knowledge that damage would probably result, there is no MARPOL violation. Secondly, the geographical scope of the Directive is, according to one stakeholder group, incompatible with MARPOL and UNCLOS rules, by extending jurisdiction to the high seas. It was indicated that this conflicts with Article 230 of UNCLOS, which provides only for monetary penalties to foreign vessels. Additionally, this policy option offers a scenario where IMO rules are sufficient to have effective enforcement and pollution prevention in the EU. As oil pollution is decreasing over the last decades with no large oil spill in Europe since 2002, some stakeholders argue that the job has already been done and the Directive is not needed.

With regards to the liability scope, MARPOL lays down detailed standards and conditions for the discharge of waste and residues at sea. According to MARPOL, operational discharges are permitted within strict discharge standards. Outside of these standards and based on international rules, ship-source discharges of polluting substances should be regarded as infringements. Accidental spills that result from damage to the ship or its equipment fall in this category by default. However, there are no implications in relation to those discharges provided that there is a proper response to the incident and that there was no intentional or reckless misconduct by the owner or master with the additional qualification that '*knowledge that the damage would probably result*' from such behaviour must be evidenced. MARPOL does not provide a general liability regime with regards to discharges that do not result from damage to the ship or the equipment. The EU legal order, by virtue of the SSP Directive in its current form, provisioned penalties to operators that surpass the MARPOL standards if they acted with intent, recklessly or with serious negligence to breach the MARPOL standards. Such liability threshold as part of the EU acquis should be maintained in the EU legal order. However, if standards were breached as a result of damage to the ship or its equipment, the MARPOL scope of liability is incorporated in the Directive and it is mirrored in the

Environmental Crime Directive. Accordingly, the EU legal order does not provide for a stricter liability scheme than MARPOL. Where a liability regime has been provisioned under MARPOL, the EU legal order transposes it in EU law.

Regarding the broader geographical scope, the SSP Directive regulates the territorial sea, the EEZ and the high seas. The reasons for limiting the enforcement and EMSA tools that Member States have at their disposal to the narrower geographical scope of only the territorial waters has been analysed and no justification has been found for not monitoring and identifying potential polluters (hence discouraging pollution) in all waters. This is also status quo since 2005 and there is no legal basis that prevents the European Union from establishing a broad jurisdictional standard. In any case, Member States should apply the provisions of the Directive in accordance with applicable international law, including UNCLOS division of jurisdictional powers, as provided in Article 9 of the SSP Directive.

With regards to the alleged contradiction with UNCLOS Article 230, the Directive does not contradict Article 230, since criminal penalties may also be of a monetary nature. Furthermore, Article 230 of UNCLOS, provides only for monetary penalties to foreign vessels in and beyond the territorial sea, however with the additional exception that if the vessel sails within the territorial sea and it concerns a case of wilful and serious act pollution, penalties of a different nature can be applied as well. Whether this is indeed the case, will be evidenced on a case-by-case basis. The later has to be seen in the context of the revision of the Environmental Crime Directive and the fact that criminal penalties will no longer be regulated under the SSP Directive.

Regarding the sufficiency of MARPOL rules to ensure effective pollution prevention in the EU, it is underlined that MARPOL outlines the rules to follow but does not offer tools for dealing with non-complying States or ships. In contrast, the current SSP Directive offers tools for dealing with non-complying ships but does not set the standards for concentrations of polluting substances. The SSP Directive is the EU's response to make sure that the international rules on the prevention of ship-source pollution are followed. As such, MARPOL and SSP Directive complement each other in the case of European seas.

To sum up, this policy option has been discarded for a number of reasons. Firstly, without the Directive, it would be more difficult for prosecutors in the EU to penalise the offenders with regards to ship-source pollution. This is status quo since 2009 and there is no legal basis that prevents the European Union from establishing a standard that is higher than the one provided in international law, as long as it complies with international law provisions. Furthermore, the alleged criminalisation of seafarers will not be relevant for the future SSP Directive and is covered by a different instrument - the new Environmental Crime Directive.

Secondly, without the Directive covering all European waters including high sea, prosecutors would not have the freedom to prosecute offenders irrespective of where the pollution occurs. In other words, ships would be discouraged to discharge illegally only in a limited geographical scope, limiting the ambition of pollution prevention as well as creating market distortions, by allowing operators to avoid sailing in territorial waters where enforcement would be more stringently pursued. Such approach is not in line with the objectives of the Marine Framework Strategy Directive, where the marine environment is addressed as a whole and not limited to territorial waters.

Thirdly, without the Directive, ship-source pollution would be less likely to be detected (no satellite surveillance). Repealing the Directive would be against the prevailing opinion of stakeholders consulted. Additionally, this policy option is not in line with the ambitions of the European Green Deal, its zero pollution target and its Sustainable and Smart Mobility

Strategy. Lastly, in 2019, there was a call from the legislator (European Parliament and the Council) in recital 13 of the PRF Directive to consider reviewing the Directive. The call for review was deemed appropriate because the EU Port Reception Facilities cannot work properly without a good legal instrument to discourage illegal discharge of polluting substances at sea of all MARPOL Annexes. In this respect, stronger rules under the PRF Directive ensure that there are enough and adequate Port Reception Facilities in ports so that no illegal discharge is incentivised at sea. As such, the penalties for such illegal discharges under the SSP Directive should be sufficiently dissuasive to discourage any ship from illegally discharging at sea instead of delivering its waste in ports.

For all the foresaid reasons, the non-regulatory policy option was ruled out and there is political will for legal action.

Annex 6 - Retained policy measures

This annex provides a more detailed description of the retained policy measures and their links to the specific objectives.

Policy measure	Short description of the measure	Link to the specific objective
PMc1 - Extend the scope of the Directive to polluting substances under MARPOL Annex III-V and to discharge water from scrubbers under MARPOL Annex VI and include a review clause to encompass future developments of the MARPOL Convention.	MARPOL is the relevant international instrument to address ship-source pollution. Currently, the Directive has in its scope polluting substances of MARPOL Annex I-II only (oil and noxious liquid substances in bulk). The extension of the scope of the Directive would lead to an increase in the total number of discharges in water considered as an offence under the SSP Directive. Firstly, this measure would expand the scope of the Directive to the following polluting substances: • harmful substances carried by sea in packaged form (MARPOL Annex III) • sewage from ships (MARPOL Annex IV) • garbage from ships (MARPOL Annex V) • discharge water from scrubbers (one of the items under MARPOL Annex VI) The pollution offence definition would cover the polluting substances and introduce harmonised penalties for such cases. Secondly, this measure would give the possibility to expand the scope of the Directive in the future. The Directive would include a review clause to encompass future developments in MARPOL. If MARPOL is amended by elements that further restrain illegal discharges by adding new substances (e.g. plastic pallets, underwater noise) then there will be a possibility to amend the Directive and include the new elements. In this case, the Commission should evaluate the need for extending the scope of the Directive and make any appropriate legislative proposals to that effect.	**SO1:** Incorporate international standards into EU law by aligning the Directive with MARPOL Annexes on discharges into sea.
PMc2 - EMSA provides training and guidance to authorities responsible for detection, verification and evidence collection.	EMSA would take a leading role in raising awareness on recent SSP developments, disseminating information, organising discussions and workshops on detection, evidence collection and verification for substances in the extended scope of the Directive and new digital technologies. These would assist Member State authorities to improve the operational effectiveness of their enforcement. This measure would allow for further guidance and training for national law enforcement authorities with regards to illegal discharges from ships and on detection of pollution from ships. This would give grounds for the authorities responsible for verification to conduct their duties more effectively. EMSA would prepare the relevant guidance documents and workshop material drawing inputs from Member State authorities and their experience with relevant operations, in collaboration with the Commission.	**SO2:** Support Member States by building their capacity to detect pollution incidents, verify, collect evidence and effectively penalise identified offenders in a timely and harmonised manner.

Policy measure	Short description of the measure	Link to the specific objective
PMc3 - The Commission establishes a dedicated expert group facilitating cooperation between Member States, including through the adoption of guidelines.	A recital would be added in the Directive on the establishment of an Expert Group on the Ship-Source Pollution Directive chaired by the Commission to support the implementation of the Directive, best practice sharing and strengthened coordination. This measure would provide for establishing the group as a regular meeting forum to develop common guidelines and interpretation. It would allow Member States to increase their capacity to implement the Directive. Interpretative guidelines would provide competent authorities with practical understanding of the Directive's provisions. Member States and other relevant organisations would share their insights on implementation and their recommendations for improvements. The group would be a vehicle to support the enforcement activities undertaken by Member States.	**SO2:** Support Member States by building their capacity to detect pollution incidents, verify, collect evidence and effectively penalise identified offenders in a timely and harmonised manner.
PMc4 - Inclusion of a provision on whistle-blowers, their protection and means of passing the relevant information.	Without prejudice to Directive (EU) 2019/1937 of the European Parliament and of the Council of 23 October 2019 on the protection of persons who report breaches of Union law (Whistleblowing Directive), a provision would be added in the SSP Directive on the possibility for reporting persons under the EU Whistleblowing Directive, to alert potential illegal discharges. The information on a potential illegal discharge from a ship can come from sources other than surveillance, e.g. observed by seafarers. This measure would offer a digital tool for passing information via an EMSA online gateway to the competent authority of the Member State(s) concerned and the protection of those who pass the information electronically. To this end, the Commission, in collaboration with EMSA, would put in place an external reporting channel which would protect the persons who report ship-source pollution breaches in line with Directive (EU) 2019/1937. Therefore, more first-hand knowledge on offences would be available.	**SO2:** Support Member States by building their capacity to detect pollution incidents, verify, collect evidence and effectively penalise identified offenders in a timely and harmonised manner.
PMc5 - EMSA further enhances the data exchange tools and automated links in the Integrated Maritime Services based on CleanSeaNet, THETIS, THETIS EU and SafeSeaNet.	EMSA develops the Integrated Maritime Services which put together relevant information and make it available in a timely manner to the Member State authorities. Integrated Maritime Services are a set of digital tools to enhance the implementation of maritime safety and pollution prevention directives. These tools include CleanSeaNet, THETIS, THETIS EU and SafeSeaNet. They were developed to different extent in order to meet a number of varied objectives of many directives. This measure would further enhance the Integrated Maritime Services platform, as to support data accessibility and information exchange. It would cover the extended scope of the Directive. This measure would promote digital solution and the reduction of administrative burden. It would create synergies between existing functions and the cross-validation of information coming from different sources. It would also enable an interoperability framework for data sharing. The integration of these	**SO2:** Support Member States by building their capacity to detect pollution incidents, verify, collect evidence and effectively penalise identified offenders in a timely and harmonised manner.

Policy measure	Short description of the measure	Link to the specific objective
	elements on one-stop-shop system would give access to information to relevant authorities and facilitate higher levels of exchange and access to shared information.	
PMc6 - The exception from liability for polluters, including crew members, will be further clarified in the Directive.	The measure spells out that a discharge of polluting substances resulting from damage to the ship or its equipment will not be regarded as an infringement unless the actor (e.g. crew member) acted either with intent to cause damage or recklessly and with knowledge that damage would probably result, provided that the actor took all reasonable precautions after the occurrence of the damage or discovery of the discharge in order to prevent or minimise the discharge. The measure would involve clarifying the existing exception from liability of polluting actors, including crew members to ensure legal certainty. Accordingly, for masters, companies and crew members, the discharge of polluting substances is not regarded as an infringement unless they acted either with intent to cause damage or recklessly and with knowledge that damage would probably result, in the case that the discharge was a result of damage to the ship or its equipment. With this measure, Member State authorities might need to clarify their liability provisions in national legislation. The measure would not change the exceptions as currently defined in Article 5 and the reference to crew, to conditions set out in Annex I, Regulation 4.2 of MARPOL or in Annex II, Regulation 3.1.2 of MARPOL will be spelled out in the Directive. The measure will expand the reference to the relevant regulations of the remaining MARPOL Annexes which provide for such exceptions. The notion of 'owner' used in MARPOL would be clarified by using instead the notion of 'company' as it may represent different entities that manage a ship. This exception applies therefore to any organisation which has assumed the operation of the ship, in alignment with the International Safety Management Code (ISM Code).	**SO3:** Ensure that persons (natural & legal) responsible for illegal discharges from ships are subject to effective, proportionate & dissuasive penalties.
PMc7 - Obligation for Member States to log their feedback data in CleanSeaNet and document if and how CleanSeaNet alerts have been verified.	When a possible oil spill is detected, an alert message is sent from CleanSeaNet to the relevant coastal State(s). This measure would make it mandatory for each Member State to record in CleanSeaNet the results of their verifications or provide the reason on why an alert was not verified. Competent authorities will need to document if and how a CleanSeaNet alert was verified. This measure is not an obligation to verify all CleanSeaNet alerts, but rather to provide feedback on the way Member States have (or have not) followed up on all alerts. Currently, approximately 40% of the CleanSeaNet alerts are recorded in CleanSeaNet as verified by Member States. It is possible that the Member State authority sends a vessel or aircraft to verify the alert but does not record this information in CleanSeaNet.	**SO4:** Ensure simplification and effective reporting on ship-source pollution incidents and follow-up activities.

Policy measure	Short description of the measure	Link to the specific objective
PM1 - Inclusion of a provision on minimum requirements for verification by means of a national target of 60% verification rate for CleanSeaNet alerts.	When a possible oil spill is detected, an alert message is sent from CleanSeaNet to the relevant coastal State(s). This measure would make it mandatory that the national authority responds to at least 60% of alerts. The response could be sending an aircraft or patrol vessel to verify the possible incident. Consequently, the verification could lead to obtaining a confirmation that an illegal discharge took place as well as obtaining relevant evidence for the purposes of prosecution. Six Member States verified more than 60% of CleanSeaNet alerts in 2020 and this was the starting point for defining the target. The underperforming Member States would need to increase their verifications to meet this target. As it is unlikely that Member States over-performing the target would adjust (reduce) their verification activities, it can be expected that the overall number of verifications would increase. This measure would provide incentives for a larger deployment of on-site assets required for verification and cooperation between Member States.	**SO2:** Support Member States by building their capacity to detect pollution incidents, verify, collect evidence and effectively penalise identified offenders in a timely and harmonised manner.
PM2a - Each Member State defines in their national legal order the components of infringements, either on the basis of 'minor cases' and 'deterioration of the quality of water', or on any other basis prescribed by the Directive, and applies administrative or criminal penalties accordingly.	By means of this measure, Member States would, in accordance with their national law, provide for competent authorities to have the power to impose appropriate penalties. Each Member State would define 'minor cases 'and 'deterioration of the quality of water', or any other basis prescribed by the Directive, without prejudice to the Environmental Crime Directive (ECD), and apply administrative or criminal penalties to ship-source pollution offences accordingly. With the flexibility to define when they follow the administrative or criminal route, Member States could be expected to align the definition so as to treat infringements according to their legal tradition. Administrative penalties and other administrative measures in relation to ship-source pollution infringements are covered by the Directive, whereas criminal penalties are expected not to be included under the scope of the Directive, as they would be addressed by the ECD. Nevertheless, the definition of criminal offence for ship-source pollution discharges under the new ECD mirrors the infringement definition under the SSP Directive, thereby ensuring that administrative and criminal enforcement regimes remain coordinated.	**SO3:** Ensure that persons (natural & legal) responsible for illegal discharges from ships are subject to effective, proportionate & dissuasive penalties.
PM2b - The Directive provides definitions of the components of infringements, either on the basis of 'minor cases' and 'deterioration of the quality of water' or on	By means of this measure, Member States would transpose from the Directive the definition of '*minor cases'* and '*deterioration in the quality of water'*, or any other basis agreed in order to define an SSP infringement and prescribed by the Directive, without prejudice to the Environmental Crime Directive (ECD). All Member States would need to follow this definition in deciding whether to pursue an illegal discharge as an infringement, criminal or administrative. A common definition would lead to a level playing field between Member States since similar infringements would need to be dealt with in a similar way across different jurisdictions. Administrative penalties and other	**SO3:** Ensure that persons (natural & legal) responsible for illegal discharges from ships are subject to effective, proportionate &

Policy measure	Short description of the measure	Link to the specific objective
any other basis prescribed by the Directive.	administrative measures in relation to ship-source pollution infringements are covered by the Directive, whereas criminal penalties are expected not to be included under the scope of the Directive in the future, as they are addressed by the ECD. Nevertheless, the definition of criminal offence for ship-source pollution discharges under the new ECD mirrors the infringement definition under the SSP Directive, thereby ensuring that administrative and criminal enforcement regimes remain coordinated.	dissuasive penalties.
PM3a - The Directive provides principles for setting the level of administrative penalties. The Commission will develop an implementing act on the criteria to be applied (e.g. depending on type of polluting substances).	The principles for setting the level of administrative penalties would be included in the Directive. This measure would also prescribe, with the support from a relevant Expert Group (see PMc3), the development of an implementing act defining the criteria for administrative penalties that would be applied across the EU. Member States would update their approach and their calculation methodology based on this implementing act. This measure would lead to the approximation of penalties across the EU, mainly, by rising potential penalty levels in cases they are considered too low.	**SO3:** Ensure that persons (natural & legal) responsible for illegal discharges from ships are subject to effective, proportionate & dissuasive penalties.
PM3b - The Directive provides principles for setting the level of administrative penalties, the criteria to be applied (e.g. depending on type of polluting substances) as well as values for the maximum and minimum levels for administrative penalties.	A provision with principles, criteria and values would be added to the Directive to ensure that adequate penalties are applied in order to dissuade potential offenders. Member State authorities would be required to review their penalty provisions in their national legislation to align them with the principles and values developed. Member States would update their approach and their calculation methodology by transposing the Directive. With this measure, a stricter regulatory approach is provisioned to ensure harmonisation of penalties across the EU. With the provision of additional administrative penalties in the Directive, a more rigid response to illegal discharges is provided to Member States.	**SO3:** Ensure that persons (natural & legal) responsible for illegal discharges from ships are subject to effective, proportionate & dissuasive penalties.
PM4 - Obligation for Member States to report their data in an EMSA-	This measure would involve the creation of a new, dedicated reporting platform. The tool would be a single-window, multi-purpose software for law enforcement authorities for the collection and exchange of data on ship-source pollution. This measure would make it mandatory for Member States	**SO4:** Ensure simplification and effective reporting on

Policy measure	Short description of the measure	Link to the specific objective
managed tool on each ship-source pollution incident.	to update the database regularly (at least annually) according to a harmonised format with: • Pollution incident and type of pollution, • Estimated volume or quantity, • Polluter details, ship type, • Penalty type, amount, • (…) e.g. geographical position of discharge The Commission, in cooperation with Member States, would develop a report template. This format would be aligned with other international and regional reporting requirements. With this measure, the Commission may adopt an implementing act specifying the type and format for reporting the information. The key non-confidential information from the reporting platform would be made available to the public online (PM5b). This measure would replace the Article 12 reporting to the Commission requirement.	ship-source pollution incidents and follow-up activities.
PM5a - Member States inform the public about ship-source pollution incidents through a national website. Member States may also report this data to the Commission.	This measure relates to the specific interest of the public in ship-source pollution. Ship accidents and intentional discharges from ships receives much public attention. With this measure, Member States would develop and operate national websites with information on pollution incidents, follow-up activities, identified violations and update them regularly in order to give information to the public. Member States also could report this information to the Commission and the Commission would publish a report on pollution events and follow-up activities based on this voluntary input. The specification of the obligation for Member States to develop a national website would apply in cases where there is no website already developed and to countries that have a coastline and/or sea going vessels flying its flag. In cases where Member States have already developed national websites, these would need to be adapted to the requirements of these provisions, in particular in terms of the information to be uploaded and presented to the public, and in the frequency of these updates.	**SO4:** Ensure simplification and effective reporting on ship-source pollution incidents and follow-up activities.
PM5b - EMSA publishes online key reported, non-confidential information about all ship-source pollution incidents at sea.	This measure relates to the specific interest of the public in ship-source pollution. Ship accidents and intentional discharges from ships receives much public attention. The information would be presented about all ship-source pollution incidents in the EU in a user-friendly format and ensure cross-border coverage. It would comprise maps and items with history of the incidents. The information displayed on the website would be non-confidential, key information. The information presented online would be extracted from the reporting tool (PM4). This measure would enhance the awareness of the public	**SO4:** Ensure simplification and effective reporting on ship-source pollution incidents and follow-up

Policy measure	Short description of the measure	Link to the specific objective
	and the shipping industry. Furthermore, establishing a website with information on pollution incidents in the EU and follow-up activities would improve consolidation at EU level, as well as increase the transparency for EU citizens and the public on ship-source pollution.	activities.

Annex 7 - Effectiveness of the different policy options

The table below provides a detailed assessment on the effectiveness of the policy options in relation to the specific objectives and related assessment criteria, complementing the overview provided in section 7.1.

Key: Impacts expected					
××	×	O	✓	✓✓	
Strongly negative	Negative	No or negligible impact	Positive	Strongly positive	Unclear
	PO A		PO B	PO C	
General objective: In line with the European Green Deal, the aim is to incorporate into EU law international standards for ship-source pollution into sea and to ensure that persons responsible for discharges of polluting substances into sea are subject to effective, proportionate and dissuasive penalties, in order to improve maritime safety and to enhance protection of the marine environment from pollution by ships					
Expected deterrent effect on the level of illegal discharges into the sea	A deterrent effect common to all POs comes from PMc1, because this measure triggers additional surveillance and penalties for a broader range of pollutants, while also increasing the detection of oil through upgrades of CleanSeaNet. There is a positive deterrent effect specific to PO A, coming from the improved information available to the public (PM5b) leading to reputational considerations of the shipping sector. PO A has lower rating as compared to PO C and PO B because the cross-border nature of the problem is less mitigated by means of cooperation and information exchange.		A deterrent effect common to all POs comes from PMc1, because this measure triggers additional surveillance and penalties for a broader range of pollutants, while also increasing the detection of oil through upgrades of CleanSeaNet. The deterrent effect in PO B relative to the baseline comes from PM3a, which improves the proportionality of the penalties, thanks to the clarity on the principles and criteria for setting the levels of penalties. The impact is expected to be smaller than PO C because it does not concern values of penalties. The deterrent effect of PO B also comes from PM2b with improved effectiveness of the penalties achieved by the harmonised definition and from the improved information available to the public (PM5b) leading to reputational considerations of the shipping sector.	A deterrent effect common to all POs comes from PMc1, because this measure triggers additional surveillance and penalties for a broader range of pollutants, while also increasing the detection of oil through upgrades of CleanSeaNet. PO C has a high deterrent effect associated with PM1 that obliges some Member States to verify on-scene a higher share of CleanSeaNet alerts, and with PM3b, which offers a strong regulatory approach towards the levels of penalties. The deterrent effect relative to the baseline is expected to be slightly higher than that of POB because the underperforming Member States are expected to raise their penalties. The deterrent effect of PO B also comes from PM2b with improved effectiveness of the penalties achieved by the harmonised definition and from the improved information available to the public (PM5b) leading to reputational considerations of the shipping sector.	

Key: Impacts expected					
××	×	O	✓	✓✓	
Strongly negative	Negative	No or negligible impact	Positive	Strongly positive	Unclear
	PO A		PO B	PO C	
Specific policy objective 1 – Incorporate international standards into EU law by aligning the Directive with MARPOL Annexes on discharges into sea.					
Expected increase in the level of detection of illegal discharges (oil, noxious substances, packaged goods, sewage, garbage and scrubber residues discharged) resulting in expected decrease in the number of infringements	PO A aligns with the MARPOL scope of substances discharged to water (Annexes I to V and residues from scrubbers under Annex VI). Common policy measure PMc1 was considered the most appropriate to align the SSP Directive with international commitments and other EU initiatives relevant to water pollution and as such alternative measures were not considered in the development of the policy options. PO A fully addresses SO1 with the deployment of technical tools to cover the increased scope of the Directive in the context of detection and infringement. It also future-proofs the Directive by enabling it to adjust with a review clause to potential changes of the existing MARPOL Annexes.	PO B aligns with the MARPOL scope of substances discharged to water (Annexes I to V and residues from scrubbers under Annex VI). Common policy measure PMc1 was considered the most appropriate to align the SSP Directive with international commitments and other EU initiatives relevant to water pollution and as such alternative measures were not considered in the development of the policy options. PO B fully addresses SO1 with the deployment of technical tools to cover the increased scope of the Directive in the context of detection and infringement. It also future-proofs the Directive by enabling it to adjust with a review clause to potential changes of the existing MARPOL Annexes.	PO C aligns with the MARPOL scope of substances discharged to water (Annexes I to V and residues from scrubbers under Annex VI). Common policy measure PMc1 was considered the most appropriate to align the SSP Directive with international commitments and other EU initiatives relevant to water pollution and as such alternative measures were not considered in the development of the policy options. PO C fully addresses SO1 with the deployment of technical tools to cover the increased scope of the Directive in the context of detection and infringement. It also future-proofs the Directive by enabling it to adjust with a review clause to potential changes of the existing MARPOL Annexes.	
Specific policy objective 2 – Support Member States by building their capacity to detect pollution incidents, verify, collect evidence and effectively penalise identified offenders in a timely and harmonised manner.					
Expected increase in the level of verification of potential illegal discharges	In PO A, the use of the existing available EMSA tools and new knowledge sharing (PMc2 and PMc3) for the extended list of polluting substances as well as the additional information on potential pollution events provided by whistle-blowers (PMc4) increases the capacity of the Member States to verify potential illegal discharges. In addition, further integrating data collection and exchange tools (PMc5) provides for a more effective use of information relevant for performing enforcement activities, and thus further improves verification	In PO B, the use of the existing available EMSA tools and new knowledge sharing (PMc2 and PMc3) for the extended list of polluting substances as well as the timely additional information on potential pollution events provided by whistle-blowers (PMc4) increases the capacity of the Member States to verify potential illegal discharges. In addition, further integrating data collection and exchange tools (PMc5) provides for a more effective use of information relevant for performing enforcement activities, and thus further improves verification	In PO C, the use of the existing available EMSA tools and new knowledge sharing (PMc2 and PMc3) for the extended list of polluting substances as well as the additional information on potential pollution events provided by whistle-blowers (PMc4) increases the capacity of the Member States to verify potential of illegal discharges. In addition, further integrating data collection and exchange tools (PMc5) provides for a more effective use of information relevant for performing enforcement activities, and thus further improves verification	

Key: Impacts expected					
××	×	O	✓	✓✓	
Strongly negative	Negative	No or negligible impact	Positive	Strongly positive	Unclear
	PO A		PO B	PO C	
	capacity for all Member States.		capacity for all Member States.	capacity for all Member States. In addition, PO C introduces a minimum verification rate for Member States on CleanSeaNet alerts (PM1). This obligation is likely to increase the incentive for Member States to follow up CleanSeaNet alerts and verify them on-scene.	
Proportion of identified offenders as a result of verification	In PO A, with better capacity of the Member States for verification of the potential illegal discharges falling under the extended scope of the Directive, it is expected to provide a wider basis for identifying the offenders based on information and knowledge gained by authorities as a result of PMc2, PMc3, PMc4. The integration of the data exchange tools (PMc5) will further improve the availability of data needed to identify an offender. This is expected to lead to an overall improvement in the effectiveness of verification of Member State authorities and thus increase the proportion of identified offenders.		In PO B, with better capacity of the Member States for verification of the potential illegal discharges falling under the extended scope of the Directive, it is expected to provide a wider basis for identifying the offenders based on information and knowledge gained by authorities as a result of PMc2, PMc3, PMc4. The integration of the data exchange tools (PMc5) will further improve the availability of data needed to identify an offender. This is expected to lead to an overall improvement in the effectiveness of verification of Member State authorities and thus increase the proportion of identified offenders.	In PO C, with better capacity of the Member States for verification of the potential illegal discharges falling under the extended scope of the Directive, it is expected to provide a wider basis for identifying the offenders based on information and knowledge gained by authorities as a result of PMc2, PMc3, PMc4. The integration of the data exchange tools (PMc5) will further improve the availability of data needed to identify an offender. This is expected to lead to an overall improvement in the effectiveness of verification of Member State authorities and thus increase the proportion of identified offenders. The introduction of the minimum verification rate for on CleanSeaNet alerts (PM1) most likely will not affect the proportion of identified offenders significantly. The measure's effectiveness is low based on past data recorded by Member States on how they follow-up CleanSeaNet alerts. The finding was that the higher number of verification activities does not necessarily lead to more identification of the actual spills or the actual offenders. Additionally, there are relatively high costs associated to the measure and the measure is not	

Key: Impacts expected					
××	×	O	✓	✓✓	
Strongly negative	Negative	No or negligible impact	Positive	Strongly positive	Unclear
	PO A		PO B	PO C	
				supported by the stakeholders.	
Specific policy objective 3 – Ensure that persons (natural & legal) responsible for illegal discharges from ships are subject to effective, proportionate & dissuasive penalties.					
Level and type of penalties is effective, proportionate and dissuasive	In PO A, the clarification of exceptions and definitions at EU level (PMc6) and on national level (PM2a) will facilitate the prosecution process in principle, consequently positively affecting penalisation. Member States will have the flexibility to define the level of penalties as in baseline. This is classified as 'no impact' compared to baseline. The evaluation showed that the Member States view the current arrangement appropriate and effective. In PO A, it is assumed that the current levels are proportionate and that in the future we will have more evidence to assess the effectiveness based on improved reporting.		In PO B, the clarification of exceptions and definitions at EU level (PMc6) and harmonisation of definitions at EU level (PM2b) will facilitate the prosecution process in principle, consequently positively affecting penalisation. In addition, the introduction of principles for setting levels of penalties and an implementing act on the minimum levels of administrative penalties (PM3a) is expected to lead to an increase in the level of the penalties imposed and harmonisation of penalties across the EU. PM3a is expected to have an impact in particular on Member States with lower penalties levels as the implementing regulation will apply directly. Thus, some of these Member States are expected to review and increase their penalty levels. It is expected that the harmonised and proportionate penalties lead to a level playing field and the levels of penalties will be high enough to discourage illegal discharge.	In PO C, the clarification of exceptions and definitions at EU level (PMc6) and harmonisation of definitions at EU level (PM2b) will facilitate the prosecution process in principle, consequently positively affecting penalisation. Although in PO C, PM3b offers a stricter regulatory approach and a more robust response to illegal discharges than PO B. PO C is expected to be as effective as PO B in this respect due to the fact that the same objective of harmonised and proportionate penalty levels is achieved. Further, the inclusion of concrete values for fines under PM4b vis-à-vis setting the criteria for calculation of such penalties under PM4a is not expected to lead to differentiated penalty levels.
Specific policy objective 4 – Ensure simplification and effective reporting on ship-source pollution incidents and follow-up activities.					
Expected improvement in the reporting on the implementation of the Directive	In PO A, the introduction of the requirement for Member States to log their feedback data on CleanSeaNet alerts (PMc7) is expected to simplify and improve the reporting on the implementation of the		In PO B, the introduction of the requirement for Member States to log their feedback data on CleanSeaNet alerts (PMc7) is expected to simplify and improve the reporting on the implementation of the	In PO C, the introduction of the requirement for Member States to log their feedback data on CleanSeaNet alerts (PMc7) is expected to simplify and improve the reporting on the implementation of the	

Key: Impacts expected					
××	×	O	✓	✓✓	
Strongly negative	Negative	No or negligible impact	Positive	Strongly positive	Unclear
	PO A		PO B	PO C	
	Directive. In addition, PO A with the requirement for each Member State to hold a website with ship-source pollution information (PM5a) will make the information on incidents more readily available to the public. However, the creation of a separate website by each Member State could lead to ineffectiveness and a multiplication of the costs related to developing and maintaining the IT infrastructure.		Directive. In addition, PO B with an online ship-source pollution information (PM5b) will make the non-confidential information readily available to the public in a cost-effective way. The new reporting tool (PM4) is expected to further facilitate reporting on the implementation of the Directive.	Directive. In addition, PO C with an EU-wide online portal with ship-source pollution information (PM5b) will make the non-confidential information readily available to the public in a cost-effective way. The new reporting tool (PM4) is expected to further facilitate reporting on the implementation of the Directive.	