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Reducing ship generated marine litter – recommendations to improve the EU port reception facilities directive

By:

Jens Peter Øhlenschläger (Port Environment)

Stephanie Newman

Andrew Farmer



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Corresponding author: Stephanie Newman (snewman@ieep.eu)

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Institute for European Environmental Policy

London Office

15 Queen Anne's Gate

London, SW1H 9BU

Tel: +44 (0) 20 7799 2244

Fax: +44 (0) 20 7799 2600

Brussels Office

Quai au Foin, 55

Hooikaai 55

B- 1000 Brussels

Tel: +32 (0) 2738 7482

Fax: +32 (0) 2732 4004

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Table of contents

List of abbreviations	1
Executive summary	2
1 Introduction	3
2 The marine litter problem	4
2.1 Marine litter sources.....	4
2.2 Environmental impacts	5
2.3 Socio-economic impacts	6
3 Shipping generated waste: the policy context	7
3.1 MARPOL Convention.....	7
3.2 The EU Port Reception Facilities Directive (2000/59/EC).....	7
4 Port reception facilities in European ports – state of play	9
4.1 Trends in waste delivery	10
5 Waste fee systems	12
5.1 Introduction of the No Special fee/Indirect fee	12
5.2 Waste definitions and volume limitations.....	13
5.3 The indirect fee as incentive for waste delivery.....	14
6 The efficiency of the waste notification system	18
7 The role of ports in ship waste handling	21
8 Efficiency of ship waste disposal and the ‘one stop shop’ approach	23
9 Strengthening the inspection regime regarding waste delivery	25
10 Conclusions and next steps	28
11 References	30

List of figures

Figure 1 Ownership and Operation of Waste Reception Facilities (Collection, Treatment and Final Disposal) in 40 European ports analysed (Source: EMSA, 2012).	10
Figure 2. Data showing the number of reported illegal discharges of oil in the Baltic Sea (Source: HELCOM, 2012). Note the entry of the PRF Directive in 2002 further supported the positive development of the reduction of the illegal discharges of oily waste.....	15
Figure 3 Purpose of Waste Notification Form in 40 EU ports (Source: EMSA, 2012).	18

List of boxes

Box 1: Definitions of Direct Fee, Indirect Fee and No Special Fee (NSF).....	12
Box 2: The 100 per cent indirect fee system in Copenhagen.....	14
Box 3: The variety of fee structures reported for waste collection in European ports	16
Box 4: The Rotterdam and Amsterdam Portbase system	19

List of abbreviations

CR	Cargo Residues
EU	European Union
EMSA	European Maritime Safety Agency
GT	Gross tonnage
HELCOM	Helsinki Commission
IMO	International Maritime Organisation
MOU	Memorandum of Understanding (as in the Paris MOU)
NSF	No Special Fee
PA	Port Authority
PRF	Port Reception Facilities
PRFD	Port Reception Facility Directive
PSC	Port State Control
SGW	Ship Generated Waste

Executive summary

Marine litter is an increasing threat to the health of European and global marine ecosystems, with costly environmental, economic and social consequences. One of the sources to this pollution comes from ships, which legally or illegally discharge their solid waste (waste) into the sea.

The EU Port Reception Facilities (PRF) Directive (2000/59/EC) regulates how ships discharge their waste to port reception facilities in the EU. The PRF Directive pursues the same aim as the MARPOL Convention, namely to reduce the amount of pollution in seas and coastlines of Member States caused by ship generated waste and cargo residues discharged into the sea by shipping.

The Directive came into force in 2002 and an EMSA study published in 2012 has shown an increase in waste delivery to Member State ports since then. Despite this increase, illegal discharges of ship generated waste into the sea still take place.

There are several explanations for this. These include insufficient control and inspection of the ships, and the difficulties in doing so, and a lack of appropriate economic incentives for waste delivery, or indeed, perverse incentives for waste delivery. Little transparency regarding the operation of the waste handling facilities and a lack of clarity in some ports regarding the role and responsibilities of the various actors involved may also be responsible.

It has become apparent that the Directive is not prescriptive enough in these respects and clearer guidelines and stricter requirements would be desirable and beneficial for the ports. This is especially true regarding the cost recovery system, as the Directive leaves a lot of room for interpretation, which has resulted in many different systems being implemented across European ports, thereby creating an uneven playing field and allowing less than optimal systems to be implemented.

This study recommends that the Directive should be revised to put a stronger focus on:

- The applied cost recovery system (degree of indirect fee);
- The efficiency of the waste notification system;
- The port authority involvement in ship waste handling (taking responsibility, control and monitoring);
- The 'one stop shop' approach, and
- The inspection regime in the port regarding waste delivery.

1 Introduction

Marine litter is a major and increasing problem affecting marine ecosystems and people that use or are dependent upon the sea and its coastline. In the European Union (EU) there is a range of legislation which contributes to tackling the problem of marine litter. The Marine Strategy Framework Directive now requires Member States to set targets with regard to the problem and adopt measures to meet these targets.

An important contributing EU law to address one source of marine litter, waste from shipping, is the Port Reception Facility Directive. The study provides an analysis of this Directive, discusses the situation in Member State ports regarding ship waste handling, and provides examples of ports with efficient systems and 'best practices'. The study makes recommendations for improvement of the implementation of the Directive. The study has been based on literature review, phone interviews and meetings.

This study will be complimented by a second study examining the scope of EU measures more widely that contribute to tackling marine litter and which will identify gaps in the framework and make recommendations for improvement.

This report begins by providing a short overview of the marine litter problem, including the environmental, social and economic impacts that it has. It then introduces the regulatory framework regarding ship generated waste, in particular the MARPOL Convention and the Port Reception Facility Directive.

The state of play in port reception facilities and in ship waste at EU ports is described. The report continues by examining specific aspects of implementation – the cost recovery system, efficiency of the waste notification system, the role of ports in ship waste handling, the one-stop-shop approach and the inspection regime. It makes conclusions and recommendations for strengthening these areas, with the objective to improve the overall handling of ship generated waste.

It is hoped that the conclusions reached here will be taken into account by the EU Institutions as they review the Port Reception Facility Directive.

2 The marine litter problem

Marine litter is an increasing threat to the health of European and global marine ecosystems, with costly environmental, economic and social consequences. It is defined as any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment (UNEP, 2005). Plastics account for 50 to 80 per cent of marine litter (Barnes et al, 2009), including macro-debris on the sea floor, floating litter and beach debris. The next section summarises the sources of marine litter and this is followed by a consideration of its impacts. A variety of measures have been adopted to address marine litter. A separate study will examine the measures adopted at EU level in more detail. However, a critical measure is the Port Reception Facility Directive which aims to reduce the input of ship generated waste to the sea. This report focuses on the application of this measure and makes recommendations for improving its regulations and implementation.

2.1 Marine litter sources

Marine litter originates from both land-based and ocean-based sources. It is largely the product of poor waste management, inadequate infrastructure and insufficient public understanding of the consequences of inappropriate waste disposal (UNEP, 2009). It is frequently cited that 80 per cent of marine debris originates from land-based sources, and 20 per cent from ocean-based sources, however the origins of this ratio are unclear (GESAMP, 1991; NOAA, 2009). Besides, this figure varies between areas; for example in the North Sea the proportion coming from shipping is thought to be closer to 40 per cent.

Ocean-based sources of marine litter include shipping, recreational boating, the fishing industry, and offshore oil and gas platforms, with litter entering the sea through both accidental and deliberate discharges of items ranging from galley waste to cargo containers.

Marine litter, or ship-generated waste (SGW), is defined according to the revised MARPOL Annex V definition, and includes:

- Food waste;
- Cargo residues contained or not contained in wash water;
- Cleaning agents and additives contained or not contained in wash water;
- Animal carcasses; and
- All other waste including plastics, synthetic ropes, fishing gear, waste bags, incinerator ashes, clinkers, cooking oil, floating dunnage, lining and packing materials, paper, rags, glass, metal, bottles, crockery and similar refuse.

The EU Port Reception Facility Directive (2000/59/EC) defines SGW as 'All waste including sewage and residues other than cargo residues, which are generated during the service of a ship and fall under the scope of Annexes I, IV and V to [MARPOL] and cargo associated waste as defined in the guidelines for the implementation of Annex V to MARPOL'. Many ports define SGW according to the Directive definition i.e. as operational waste generated during voyages and including oily waste from machinery space, sewage and waste. Regarding solid waste however, it is not always clear what is ship generated, but it is normally considered as 'domestic household waste'.

Although there are still many uncertainties, there is little doubt that the illegal discharge of waste by ships is an important source of marine litter worldwide. Globally, it was estimated in 1982 that 8 million items of marine litter entered the world's oceans and seas every day, of which 5 million items were thought to be thrown overboard or lost from ships (UNEP, 2009). However, year on year the quantity of marine litter is increasing (UNEP, 2011). Relating to Europe specifically, it has been estimated that around 20,000 tonnes of waste is dumped each year in the North Sea. In the Netherlands it has been estimated that as much as 90 per cent of the plastic found on beaches originates from shipping and fisheries (Van Franeker, 2010).

This study addresses the problems related to the discharge of *solid waste (waste)* from ships. However, it should be noted that the term SGW is often taken to include oily waste from machinery space, sewage and waste (see definitions on page 2) and it is therefore not always possible to distinguish between specific waste types. Therefore, although the primary focus of this study is litter, in assessing and discussing policy options other forms of ship source pollution may also be considered.

2.2 Environmental impacts

Ship-generated waste (SGW) comes in many forms and has many impacts on the marine environment. Historically, the biggest concern has been the dumping or accidental discharge of oil and bilge water. Today, however, there are also wider fears about the impact on marine ecosystems of SGW, including wastewater, cargo residues (minerals, grain, salt, sugar, etc.), and ship-source litter.

Depending on the type and quantity of litter (including SGW), the effects on marine ecosystems may range from direct mortality or harm to marine wildlife as a consequence of the ingestion of or entanglement in marine litter, to indirect harm or mortality resulting from the release of potentially toxic chemicals attracted to plastics in organisms after ingestion.

Many marine species have been reported to ingest marine debris, especially plastics, either because of misidentification of litter as natural prey or accidentally during feeding and other normal behaviours (Gregory, 2009). Ingestion can cause harm through physical damage, but also through chemical consequences of ingestion. For example, chemicals incorporated in or attracted to plastics in seawater have a broad range of potentially toxic, carcinogenic and hormone disrupting effects which might result as a consequence of ingestion (Thompson et al, 2009).

A review by UNEP (2011) concluded that of the 120 marine mammal species listed on the IUCN Red List, 54 per cent are known to have been entangled in or have ingested plastic debris. There is also much evidence on particular coasts of seabirds and marine reptiles becoming entangled in or ingesting litter. Plastic debris has also been implicated in the transport of non-native invasive species which can travel considerable distances on floating debris. However, UNEP also concluded that there is a lack of research on the effects of marine litter on species or on ecosystem goods and services.

2.3 Socio-economic impacts

The accumulation of litter in the marine environment inevitably has associated economic and social costs, in addition to the environmental harm caused. These impacts can affect a range of marine sectors including aquaculture, coastal agriculture, fisheries, shipping (including leisure boating), power generation and tourism. The most visible and obvious impact is the cost to tourism and local authorities of marine litter on beaches. Not only is beach debris an offence to the visual and aesthetic sensitivities of tourists and local visitors to beaches, but particularly in the case of sanitary and medical waste it can cause injuries or pose a risk to human health. For these reasons tourists tend to avoid beaches with a high marine debris concentration. A study conducted by Balance et al (2000) highlighted that an increase of litter to 10 pieces per m² would deter 40 per cent of foreign tourists and 60 per cent of domestic visitors from returning to those beaches. Mouat et al (2010) estimated that municipalities in the UK spend approximately €18 million each year removing beach litter, which represents an increase in cost of 37 per cent over the previous 10 years. Similarly, removing beach litter costs municipalities in the Netherlands and Belgium approximately €10.4 million per year (Mouat et al, 2010). Less obvious costs are rescue costs for aiding ships with fouled propellers or blocked outages. In 2008, for example, there were 286 rescues to vessels with fouled propellers in UK waters at a cost of between €830,000 and €2,189,000 (Mouat et al, 2010).

In conclusion, marine litter presents serious threats to marine ecosystems and the people that use or are dependent on our seas and beaches. Thus it is important that effective measures are put in place to address this problem. The PRF Directive is a critical measure to address the particular problem of litter arising from the generation of waste on shipping.

3 Shipping generated waste: the policy context

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main global Convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. All EU Member States have signed this Convention. At the EU level, the Directive Port Reception Facilities for ship-generated waste and cargo residues (the PRF Directive) pursues some of the aims of the MARPOL Convention. In contrast to the Convention, which regulates discharges by ships at sea, the PRF Directive focuses on ship operations in EU ports.

3.1 MARPOL Convention

MARPOL requires signatories to the Convention to *'ensure that adequate reception facilities for ship generated waste and cargo residues are established and able to receive such waste from ships calling at the port without causing the ship any undue delay'*.

The Convention, which includes six annexes for different waste types, provides a number of recommendations on how reception facilities can be established. It does not however specify in detail how waste handling should take place, and leaves all organisational issues to be determined by the responsible port authority. Compliance with the Convention requires the efficient collection of waste from ships, and what happens thereafter is regulated by national legislation.

Normally, each ratifying country decides whether it is in compliance with the requirements of the Convention. However, the International Maritime Organization (IMO) has implemented a system whereby ships can report any inadequacies of port reception facilities directly to the IMO. The IMO will then contact the respective country to ensure compliance. However this does not happen often.

3.2 The EU Port Reception Facilities Directive (2000/59/EC)

This Directive aims to reduce the amount of pollution in seas and on coastlines of Member States caused by ship-generated waste (SGW) and cargo residues discharged into the sea. This is to be done by improving the availability of reception facilities at community ports in order to meet the needs of ships without causing undue delay to their operation. The Directive applies to all seagoing ships calling at, or operating within, a port of a Member State (excluding warships, and ships belonging to, or operated by, a State for non-commercial governmental purposes¹). Some fishing and recreational vessels are exempt from some articles in the PRF Directive where they have low passenger numbers.

Ports must have adequate facilities for the prompt reception of waste and cargo residues from ships, and a handling plan including a description of all issues relevant for efficient ship waste handling, e.g. a waste notification system, a cost recovery system and collection procedures. Information on the type and quantity of waste to be delivered must be notified to the relevant body and kept on board by the Master of a ship using the form set out in Annex II of the Directive. All SGW must be delivered to port reception facilities unless the

¹ For these ships Member States should take measures to ensure these ships deliver their ship-generated waste and cargo residues in a manner consistent, in so far as is reasonable and practicable, with the Directive.

Master can certify that sufficient storage capacity exists on board to cope with waste that will be accumulated before the next port of call. Port authorities may take steps to require the vessel to deliver its waste before departure if they feel that there is a risk that the waste will be discharged at sea. Ships with frequent port calls may be exempted from the requirement to notify and deliver their waste if there is sufficient evidence of an arrangement to deliver waste at a port along their route.

Member States are to ensure that the costs of port reception facilities for SGW are recovered through fees charged to ships; these fees should provide no incentive to ships to discharge their waste at sea. To this end, all ships calling at a port should contribute 'significantly' to these costs regardless of whether they use the facilities, but a part of the costs may be charged on the basis of the type and quantity of waste actually delivered. Fees may be reduced in the case of ships designed to produce less waste. Fees for delivery of cargo residues are to be paid by the user of the facility.

Member States must ensure that sufficient inspections are carried out to check compliance with the requirements of the PRF Directive regarding delivery of waste and cargo residues. A ship which has put to sea without delivering its waste may be detained at its next port of call. Member States must take steps to ensure maximum compliance with the duty to deliver, including: providing information on the Directive's requirements; designating appropriate authorities to carry out the requirements of the Directive; ensuring that formalities relating to the use of reception facilities are sufficiently simple to avoid undue delay; and ensuring that the treatment of waste is carried out in accordance with the relevant waste legislation. The Directive requires penalties to be set for the breach of its provisions, and compensation to be given to ships that are unduly delayed by inadequate waste management facilities at a port.

4 Port reception facilities in European ports – state of play

Collection of ship source waste to port reception facilities has for many years been left to two key players to deal with, namely ports and ships. However, the ongoing illegal discharge of ship-generated waste (SGW) has led to more regulation and legislation in order to ensure that ports and ships fulfil their responsibilities and adopt more environmentally sustainable behaviour. Historically, many ships have found it easier and cheaper to discharge waste illegally at sea, a situation exacerbated by the weak enforcement of existing legislation. In addition, many ports were reluctant to invest in reception facilities or to establish efficient waste handling systems, since it was rare for ships to request to discharge waste at such facilities, and since waste handling was not regarded by ports as a core business area.

MARPOL and the EU's PRF Directive do not prescribe how port reception facilities should be established and operated. In essence, MARPOL simply requires signatories to the Convention to provide reception (i.e. collection) facilities that can receive the waste from ships without causing them any undue delay. It is up to the responsible party (most often the port authority) to decide how exactly it provides this service. The PRF Directive goes a step further, introducing requirements on waste notification and to some extent on cost recovery, but leaves other important strategic decisions to the port itself. As a result there is a large degree of variation across the EU in the operation and ownership of the facilities, the involvement of port authorities in waste handling, and waste delivery regimes.

The **ownership and operation of reception facilities** in European ports can be categorised as follows (other options exist but are not generally seen in European ports):

1. Facilities are port authority owned and operated;
2. Facilities are port authority owned and privately operated; or
3. Facilities are privately owned and operated.

The majority of European ports operate under a system where private operators are involved in both the collection and treatment of waste. The European Maritime Safety Agency (EMSA, 2012) reviewed the delivery behaviour of the 40 largest ports in Europe, observing that they all involved private waste operators in some form or another in their handling of ship waste (Figure 1). Reasons for this include their waste handling experience, the cost of provision of waste collection services, and port policies on ownership and operation. 31 out of 40 ports left all ship waste handling activities to such operators, although in some ports the port authorities were also involved with facilities and operations (see Figure 1 below). A few port authorities were involved in the collection of sewage because existing infrastructure and facilities were available in the port.

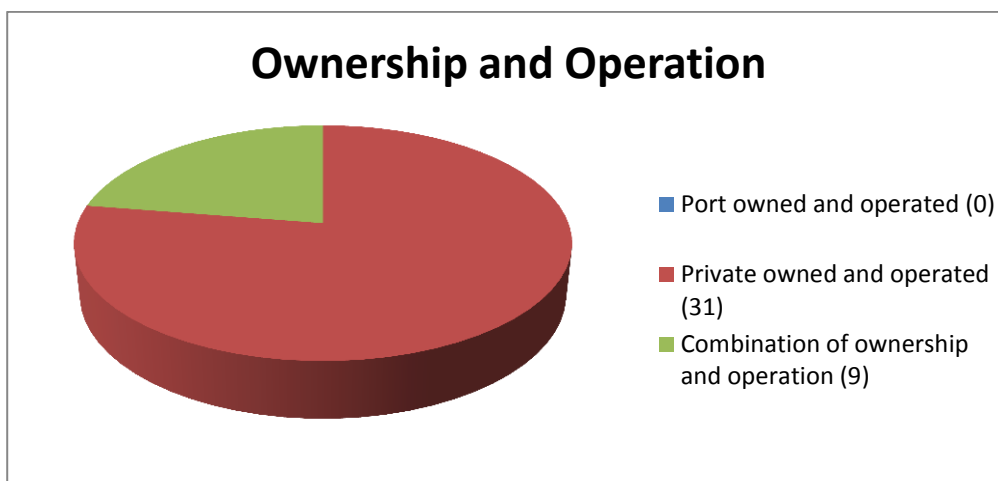


Figure 1 Ownership and Operation of Waste Reception Facilities (Collection, Treatment and Final Disposal) in 40 European ports analysed (Source: EMSA, 2012).

There are different approaches to waste collection at ports throughout the EU. Some ports have introduced individual collection, meaning that for each call to port the waste operator will visit the ship and either collect the waste bags or place a waste container alongside the ship for the vessel to use. In other ports the ship's crew simply places the waste at the berths of the ship and the waste collector picks it up en route. Finally, in other ports the crew places the waste bags in special containers positioned in the port area, which are then emptied by the operator under a planned schedule. For ships spending a longer time (e.g. more than a day) in the port, all of the above procedures can work, but for ships spending only a few hours in port before departure, given the other activities that the crew try to achieve in this time (whether it be essential maintenance operations or resting in preparation for the next leg), it can be more challenging for the crew to find the time to deliver waste from the ship.

4.1 Trends in waste delivery

The entry into force of the PRF Directive in 2002 increased the attention from authorities, and the awareness within shipping organisations, of the problem with illegal discharges of ships' waste as well as the need to identify measures to reduce discharges. Despite this, some ships continue to discharge waste illegally at sea. On a global level it is assumed that only about 27 per cent of all ship waste is delivered to reception facilities, while the majority is dumped or incinerated (Sheavly and Register, 2007). It is extremely difficult to find reliable data on quantities of waste delivered at ports in the EU. The European Maritime Safety Agency (EMSA) has in various studies concluded that most port reception facilities in Europe are *adequate*, although there were many cases where the provision of port waste reception facilities was poor (particularly for oily waste and in smaller ports, marinas and fishing harbours, where waste reception handling plans and monitoring are still lacking). The term '*adequacy*' is also used in MARPOL, but it is very difficult to determine whether port reception facilities are adequate as most ship waste handling is provided by private waste operators and the adequacy of their facilities cannot always be assessed.

EMSA (2012) has collected data on the total amount of waste delivered to port reception facilities in Europe from 2004 to 2010. From 2004 to 2007 the total amount of waste delivered was quite stable at just over 150,000 tonnes, but this was followed by a significant increase in 2008 and 2009 to over 220,000 tonnes and a small drop in 2010. This trend is also seen when the data are corrected for the number of port calls and total gross tonnage (GT) of ships calling at the port. The increase in the amount of waste delivered during the period 2008-2009 is significant and cannot be explained by an increase in traffic, as there was a decrease in both the number of port calls and in the total GT of ships calling at the ports in 2009.

A number of variables are likely to have affected these trends. For example, the increase in 2008 and 2009 could be due to an increase in cruise liner traffic, which tends to increase the amount of waste delivered. However, some cruise liners may have entered into special agreements regarding waste delivery, resulting in them not notifying their waste to the port and the waste delivery not being registered, which could also influence the waste figures. Regarding the decrease in waste delivery in 2010, some ports interviewed in the EMSA study cited the financial crisis and fewer calls in 2010 as an explanation. However, there was also a decline in delivered waste per call, which suggests there must be another reason, besides traffic, for the decline. It is therefore difficult to make inferences about the trends in waste delivery based on the quantitative evidence available. Fortunately, qualitative and anecdotal evidence can provide some insights into the issue, including the factors which tend to incentivise waste delivery.

The delivery of waste (and in principle other waste) to port reception facilities can be influenced by several factors. Obviously the more traffic entering port, the more waste one would expect to be delivered. Equally the size of the ship and the distance it has travelled since last delivering waste are key variables. Irrespective of these variables, there are a number of factors which will influence the incentives for waste delivery placed on any ship when entering any port of call. These include:

- The price of the waste collection services and the applied cost recovery system (degree of indirect fee) in place at the port;
- The efficiency of the waste collection system in the port and the ease for ships to deliver waste (i.e. whether the agent has to deal with several waste operators, or a 'one stop shop' service is provided by one operator);
- The design and efficiency of the waste notification system;
- The port authority's involvement in ship waste handling (taking responsibility, control and monitoring); and
- The inspection regime in the port regarding waste delivery.

The subsequent chapters analyse these factors, providing examples from various EU ports to illustrate how they might be implemented in practice.

5 Waste fee systems

5.1 Introduction of the No Special fee/Indirect fee

One of the most important factors in incentivising ship waste delivery is the waste fee system introduced by the port (definitions of the respective fees are provided in Box 1). Due to the increasing number of illegal discharges in the Baltic Sea, in the late 1990s the HELCOM Convention provided a number of recommendations regarding the introduction of a 'No Special Fee' (i.e. an indirect fee) in Baltic ports. This 'indirect fee' approach was discussed at the European level prior to the PRF Directive coming into force in 2002. Article 8 of the PRF Directive states that the waste fee system must not provide any incentive to discharge ship waste into the sea, and that a 'significant' part of the waste fee shall be paid by all ships calling at ports, irrespective of waste delivery. According to a Commission declaration annexed to the Directive, 'significant' means at least 30 per cent.

However, the Directive provides very little guidance on how such waste fee systems should actually be designed. Therefore whilst most Member State ports have implemented an indirect fee as part of their waste fee system, a number of different systems/models have been implemented (EMSA, 2005). The interpretation by most ports is that the minimum of 30 per cent is a fraction of the total cost of ship waste handling. However, most ports do not have information on the total cost, since all or most ship waste handling is carried out by external waste operators. Therefore it has not been possible for ports to fully understand and comply with this part of the Directive. It does nevertheless appear that some cost recovery systems, such as the 100 per cent indirect fee, work better than others at ensuring waste delivery.

Box 1: Definitions of Direct Fee, Indirect Fee and No Special Fee (NSF)

A *direct fee* is paid only if waste collection services are provided.

An *indirect fee* is paid regardless of whether waste collection services are provided or not.

The indirect fee approach is sometimes also referred to as a '*no-special-fee*' (in Scandinavia), '*mandatory fee*' (in some UK ports) or '*sanitary fee*' (in Poland), but definitions are not precise and the terminology should be seen more as referring to a general principle rather than a precise concept.

Often the term '*100 per cent indirect fee*' is used, although there are different understandings of what this should involve:

- Some ports have introduced a '100 per cent indirect fee' for delivery of oily waste from machinery space, sewage and all waste defined under MARPOL *without any limitations on the volumes that can be discharged*;
- Other ports have introduced a '100 per cent indirect fee' for delivery of oily waste from machinery space, sewage and waste but *with some limitations on the volume of waste accepted*. This limitation is often linked to the ship size and the size of the indirect fee charged, and some therefore do not consider this to be truly 100 per cent indirect;
- Finally some ports have introduced a '100 per cent indirect fee' for delivery of oily

waste from machinery space, sewage and waste *with limitations in the type of waste accepted*. Again it can be questioned whether this is technically '100 per cent indirect'.

Note that regardless of whether a fee is direct or indirect or any limits on amount, the fees vary from one port to another.

5.2 Waste definitions and volume limitations

Waste as defined under MARPOL includes all solid waste and liquid cargo residues. The solid part can be further divided into ship generated waste (SGW), e.g. glass, metal, paper, plastic and food/organic waste, and solid hazardous waste. Ships typically need to discharge SGW, and will sometimes also need to discharge other kinds of solid waste such as hazardous solid waste (that might include items such as television sets and fridges). However the latter are not generally considered to be 'ship generated' and consequently do not normally fall under the indirect fee systems that are implemented in many ports. Instead this solid hazardous waste is paid for separately, either through a direct fee (typically based on real cost) or according to a price list.

The 100 per cent indirect fee system was introduced for SGW (waste, oily waste from machinery space and sewage) by several Baltic Sea ports in the late 1990s. The exact form of the fee varies, but in general it means that the cost of delivering SGW to port reception facilities is included in the fee paid by all ships visiting the port. The exceptions to this are ferries and liner traffic which are exempted due to the high frequency of their journeys. These vessels normally negotiate a fee accounting for their regular port visits. Most ports have introduced a maximum limit on the amount of SGW that can be covered by the indirect fee, based on ship size; additional SGW incurs an additional fee. In reality most ports have a pragmatic approach and as long as the additional amount is regarded as 'reasonable' they will allow it to be discharged under the indirect fee (EMSA, 2012). Ports usually make information on the amount of the indirect fee and the amount of waste that can be discharged by each size of ship available, either on their website and/or in their Port Waste Management Plan/Manual. Shipping agents should thus be aware of the delivery conditions and pricing.

The 100 per cent indirect fee system effectively prevents cost from becoming a disincentive for using port reception facilities. With all ships paying the fee (regardless of use) and thus contributing to the financing of port reception facilities, this approach can also reduce the size of the fee. The administrative burden also appears to be lower when a 100 per cent indirect fee system is adopted. This is because operators (public or private) simply collect waste without the ports' financial departments having to calculate fees based on the actual amounts of waste delivered. One negative effect however is that ships will tend to deliver oily waste at each port, rather than accumulating the waste on board and delivering only when slop tanks are full. This results in smaller amounts of waste being delivered at each port which can be costly and inefficient. For waste, more frequent deliveries of smaller amounts of waste are not really a problem as it is much easier and cheaper to dispose of than oil. Interestingly, due to the rising price of oil the economics of oily waste disposal are changing, with it becoming more economic to collect waste in order to derive the valuable oil from it.

5.3 The indirect fee as incentive for waste delivery

The only quantitative evidence analysing the effect of the 100 per cent indirect fee on waste disposal relates to the disposal of oily waste, rather than solid waste. Nevertheless it is a reasonable assumption that the same principles would apply to solid waste. Figure 2 demonstrates that the introduction of the indirect fee coincides with a significant decrease in reported illegal discharges of oil into the Baltic Sea. Since waste is easier to deliver than oily waste and is often delivered at the same time, it is reasonable to assume that the number of illegal waste discharges at sea also dropped over this period.

It is difficult to identify a port with a truly 100 % indirect fee system. This is because there are different interpretations of the indirect fee system, and most ports have adopted a pragmatic approach and normally take garbage within the fee as long as it appears to be a 'reasonable' amount. The ports in Scandinavia have come the closest to implementing a truly 100 per cent indirect fee system. Examples of bigger Scandinavian ports which have implemented such a cost recovery system are Gothenburg, Copenhagen, Klaipeda, Helsinki and Stockholm. These ports accept ship generated waste (including sewage, solid garbage and oily waste from machinery space) under the indirect fee, which is calculated per GT of the ship. Some ports will have volume restrictions based on the ship size (specified in port regulations), but often the port just takes what is reasonable. Details of the indirect fee system in Copenhagen are given in **Box 2**.

Box 2: The 100 per cent indirect fee system in Copenhagen

The waste fee system applied by the port of Copenhagen is *an indirect fee* to be paid by all ships calling at the port. Included in the indirect fee are 'ship generated wastes' (SGW) – oily waste from machinery space, solid waste and sewage at reasonable amounts or what has been generated from last port of call.

Additional charges shall be paid if the waste volume exceeds what is reasonable, but in general the port has a pragmatic approach to this. Additional charges can also apply if the ship is not ready to discharge when the operator is ready at ship side (they are charged with a fee for the waiting time).

The *port is in charge of the waste fee system* and calculates the level of the indirect fee and decides when additional charges have to be paid. The indirect fee and additional charges are collected by the port, but direct fees/payment, e.g., for cargo residues, will take place directly between the ship/agent and the waste operator. The *indirect fee is collected by the port as part of the port dues* and is not specified on the invoice.

At present there are limitations for oily waste from machinery spaces and sewage (black and grey water), but not for solid waste. The port has no explanation for this and actually now wants to look into this because many (all) cruise liners are discharging huge volume of solid waste under the indirect fee, which was viewed as unfair by the port. The port now wants to investigate if solid waste could be included under the indirect fee with a volume limitation. Today, national regulations say that payment of collection of solid waste shall be included in the indirect waste fee and not depending on the volume or type of the solid waste.

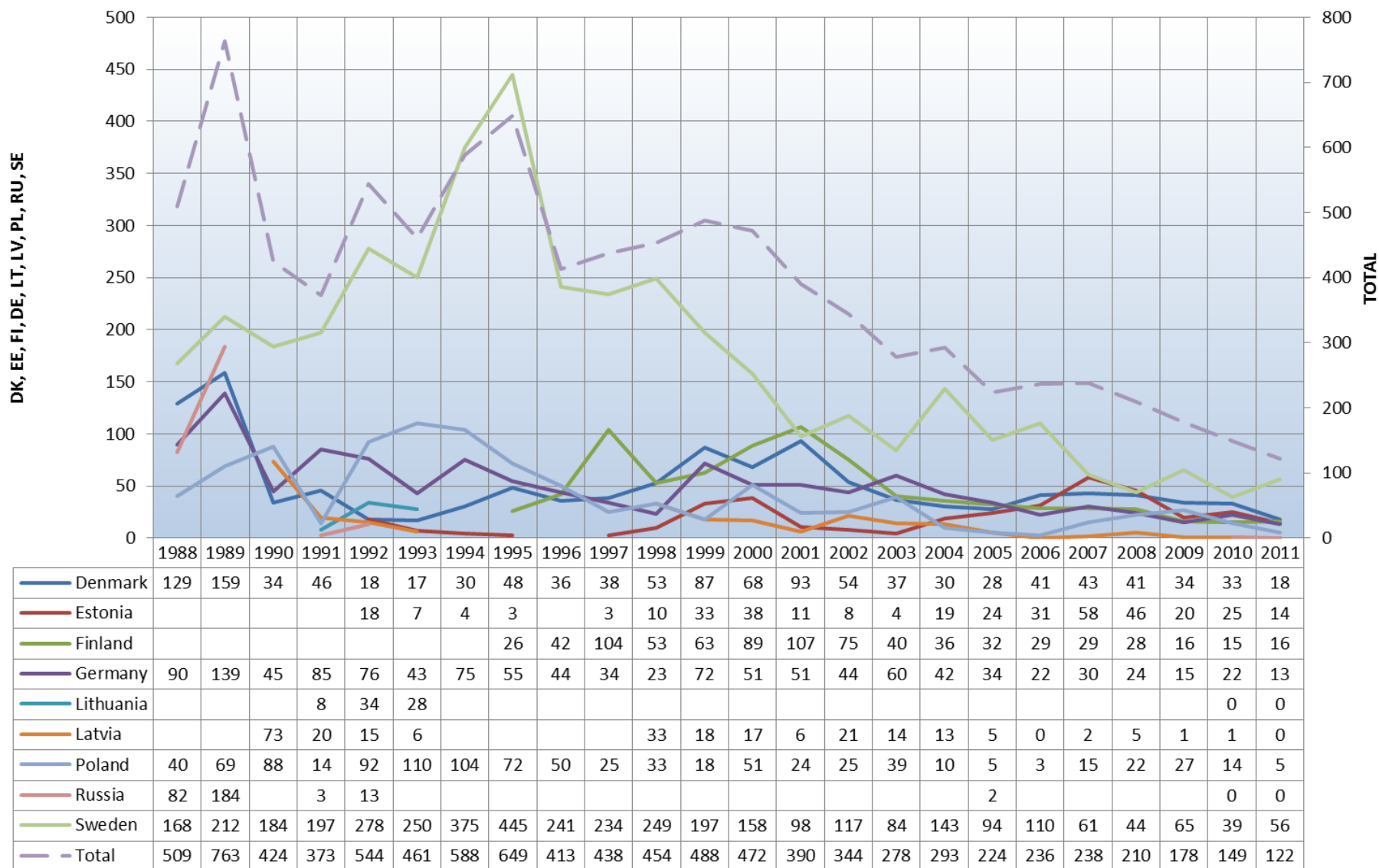


Figure 2. Data showing the number of reported illegal discharges of oil in the Baltic Sea (Source: HELCOM, 2012). Note the entry of the PRF Directive in 2002 further supported the positive development of the reduction of the illegal discharges of oily waste.

Most European ports outside of the Baltic have introduced an indirect fee for waste. Again, the ports appear to have taken a flexible approach to the amounts discharged, if they are considered 'reasonable'. This should reduce or remove the incentive for illegal discharge as the cost of discharge to a port reception facility has already been paid. However, this is not the case when certain types of waste are excluded from the indirect fee and are instead subject to direct fees. Examples of these types of waste include televisions, fridges, batteries, lamps, etc. When ships expect to have to pay direct fees on top of the indirect fee, they may be tempted to discharge waste into the sea, manipulate the Waste Record Book, and not declare it on the waste notification form for the next port of call. Under these circumstances it is almost impossible for authorities to discover illegal discharges, unless the action is observed by someone or a member of the crew communicates it to the relevant authorities. It may be appropriate to develop a clearer definition of which types of waste are, or can be, included in an indirect fee, in order to ensure clarity for ship operators and port authorities.

The EMSA study analysed 40 European ports, asking for information on their use of waste fees. The variety of fee structures reported for these ports is detailed in **Box 3**.

Box 3: The variety of fee structures reported for waste collection in European ports

100 per cent indirect fee (fixed fee based on GT of ship and irrespective of quantity of waste): 5 ports - Karlshamm, Goteborg and Stockholm (Sweden), Copenhagen (Denmark) and Tallinn (Estonia).

100 per cent indirect fee (but with limitations on waste volume and often based on ship size): 30 ports - Antwerp and Zeebrugge (Belgium), Varna and Burgas (Bulgaria), Cyprus (Cyprus), Fredericia (Denmark), Vene-Balti (Estonia), Helsinki, Rauma and Turku (Finland), Bremerhaven (Germany), Volos and Piraeus (Greece), Shannon Foynes and Cork (Ireland), Riga and Klaipeda (Latvia), Amsterdam and Groningen (the Netherlands), Gdansk, Szczecin and Swinoujscie (Poland), Sines (Portugal), Koper (Slovenia), Algeciras (Spain), Southampton and Immingham (UK). In Dunkerque (France), the amount of waste allowed is limited by the volume of container. In Rotterdam (the Netherlands), the indirect fee payment is only in place for waste including 50 per cent of the cost for waste. In Lisbon (Portugal), limitations are based on EUR payment – not volume.

Significant indirect fee as incentive: 2 ports - In Genoa (Italy), the indirect fee payment is only in place for waste including 50 per cent of the cost for waste. In Malta (Malta) there are sanctions for not delivering waste.

Direct fee for waste collection paid from ship agent to waste operator: 3 ports - Constanta (Romania). In Trieste (Italy), the indirect fee payment is only in place for waste including 50 per cent of the cost for waste. In Venice (Italy), an indirect fee is paid but does not provide any free waste collection.

It is likely that the use of different waste fee systems by EU ports is creating confusion among ship owners and operators. It can also be construed as detrimental to those ports that have no limits on waste volume, as some ships have been known to accumulate their

waste until they reach a port (such as Gothenburg) where collection of all waste is included in the indirect fee instead of paying for its disposal at another port en route. This situation has arisen mainly due to the lack of clear guidance for the implementation of the PRF Directive. Understandably, ports generally introduced a system that required the least amount of change to their existing system, rather than adapting to a new and more appropriate system.

Given these conclusions, the following recommendations are made regarding the fee systems:

- 1. A 100 per cent indirect fee system for SGW and defined hazardous substances should be implemented in ALL European ports as it seems to provide the best incentive for waste delivery. Any limit on volumes should be such that this is used only in truly exceptional circumstances.***
- 2. The collection system should ensure that solid waste can be delivered easily by ship crews to the waste operator/waste bins and that the notified volume and waste types correspond to what is delivered. A 'receipt issuing' system should be implemented (duly signed by ship captain/crew and waste operator). This means that waste shall be collected and approved at the berth by a collector and that the situation today, where solid waste is dumped by the crew into containers permanently placed on berths, shall not take place.***
- 3. All fee payments should go to Port Authorities which compensate any private operator. This will ensure transparency. In order to remove the incentive to discharge any waste not covered by an indirect fee to the sea, improved monitoring of the ship and its waste record books should be introduced.***

It is important to note that if Port Authorities manage the flow of money (payments from agents and to operators) they should play a more central role in waste management and this would require substantial organisational change in some European ports. In addition under this scenario it is possible that fewer operators would be utilised, unless the port opened up the tendering process to all approved operators with a set 'pricelist' according to which the operators could work and be reimbursed.

6 The efficiency of the waste notification system

The PRF Directive prescribes that all ports shall establish a notification procedure and use the 'advance waste notification form' developed and annexed to the Directive. The Directive clearly states that application of the waste notification form is mandatory. The rationale behind implementing a uniform advance waste notification system with uniform notification forms was:

- To make it easier for calling ships to notify (same form in all ports);
- To make it easier for authorities to monitor ships' waste delivery;
- To plan better for efficient waste collection;
- To prepare statistical reports; and
- To facilitate invoicing.

Indeed EMSA (2012) found in the 40 European ports analysed that the applied waste notification system does appear to serve a variety of purposes, from the preparation of delivery, to monitoring, invoicing and statistical purposes (Figure 3).

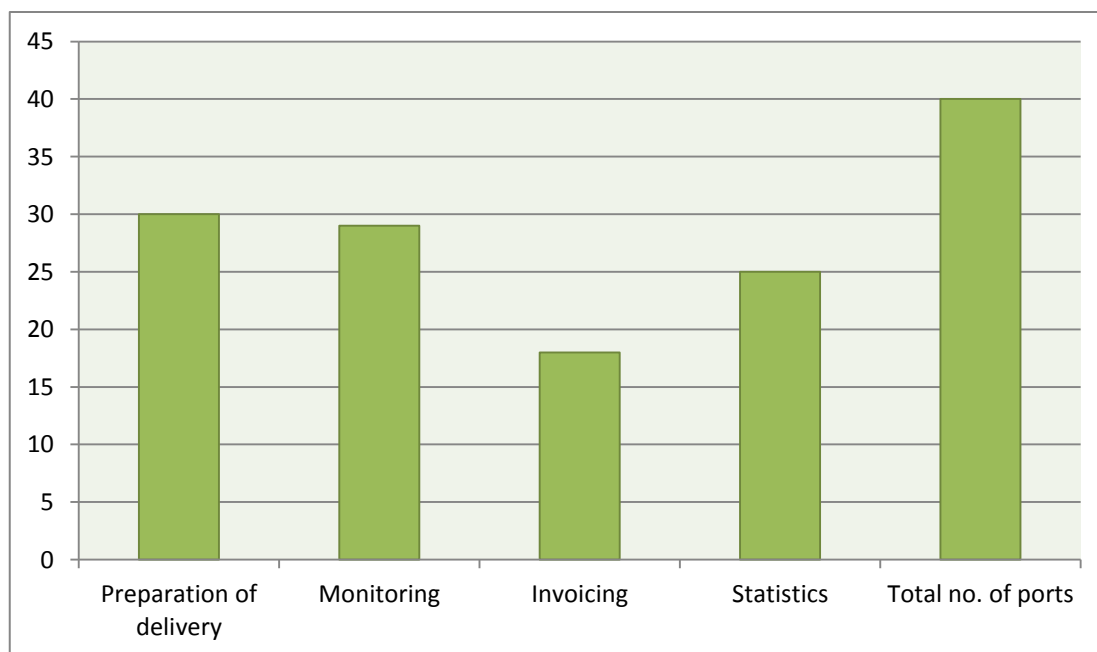


Figure 3 Purpose of Waste Notification Form in 40 EU ports (Source: EMSA, 2012).

All European ports have a waste notification system implemented and the majority receive the notification form via fax or email. However, some ports have jointly implemented an electronic system for port logistics, including waste notification. This system is called Portbase and aims to be the only point of contact for all logistics information related to the ports. This is illustrated by the Rotterdam and Amsterdam Portbase system described in Box 4.

Box 4: The Rotterdam and Amsterdam Portbase system

The starting point involves the ship's captain declaring what waste materials are on-board. In order to do this, the shipping companies/agents download a blank electronic form for the notification of waste materials to be discharged to the port reception facility (in Excel) and forward this by email to the captain. On board the ship, the captain fills in the notification of waste disposal and returns the form by email to the shipping agent. The shipping agent can easily import the data into the Portbase system using an access code (for this reason only shipping agents may submit notifications into Portbase). In situations where electronic communication with the captain is not possible, a paper form is used instead. Under this circumstance the shipping agent must enter the data into the Portbase system manually. The Harbour Master will thus be notified once the Portbase system is updated. Simultaneously, the waste collectors receive a pre-notification specifying what waste they need to collect from the ship. The actual order for executing the pick-up of a ship's waste however is issued separately by the shipping company/agent. This system was set up following extensive consultation with shipping interests in order to make sure it is as user-friendly as possible, involving the smallest number of manual actions.

However there is evidence to suggest that the waste notification form is not being used to the best advantage. For example, in a number of ports where the waste handling system is run by private operators, those operators make direct contact with the shipping agent to arrange waste collection. By doing so the waste operators obtain the information they require directly from the ships and not via the Port Authority and the waste notification form. This means that there are often two parallel systems of communication in place: one from the shipping agents to the port authority and one from the agents directly to the operators. In the latter communication channel the waste notification form primarily serves the purpose of invoicing ships. Thus when a port uses these 'parallel communication channels' some of the potential functions of the waste notification system become redundant, and the waste notification form is not being used to its full potential. For the shipping agents to communicate the same information twice is burdensome. Furthermore it means that the ports and the inspection authorities are not provided with as much information. This suggests that the monitoring of waste is not as comprehensive as it should be although it is unclear as to the extent of this problem across Europe.

It is clear that in order for the port authority and, more importantly, the inspection authority to monitor and detect poor compliance they need to have a proper understanding of the waste disposal operations at port. This would be easier if the waste notification forms were managed centrally and the relevant information was distributed or easily accessible to the relevant actors.

As a result, the following recommendations are made:

- 1. The problem of dual communication in some ports may be avoided by amending Article 6 of the PRF Directive. By leaving room for different interpretations of the definition of responsible authority, organisation or operator, Article 6 of the Directive does not clearly define who bears the responsibility for receiving the information on the notification form. A clearer prescription of the obligations on the authority and/or***

the operator may lead to a better attribution of responsibilities (mainly to the port authorities in cooperation with the PSC and, when present, the Maritime authorities) making the system more efficient and effective.

- 2. It is recommended that the same notification form is used in all Member State ports (only with minor adjustments to allow for national specific requirements) and that all waste notifications are sent to port authorities with copies to relevant stakeholders such as waste operator(s), terminal operators and inspection authorities. When port authorities are in charge of notification and distribution of information to relevant stakeholders, it will ensure that they have knowledge of the operations despite them being carried out by external operators. In this way the port authorities will play a more active and central role, taking on more responsibility. Furthermore, it enables operators to provide more efficient services when notification is centrally organised.*
- 3. The monitoring process must be strengthened by having the responsible inspection authorities involved and informed about waste notifications through automatic reception of a copy of the waste notification form immediately upon receipt. This will facilitate the transmission of information to PSC and provide sufficient time to make inspections before the ship leaves the port.*

In most Member State ports the Port Authorities are responsible for compliance with MARPOL and the PRF Directive. The PRF Directive requires, among other things, a cost recovery system, a waste notification system and the preparation of waste handling plans, but is not prescriptive when it comes to assigning roles and responsibilities of Port Authorities in ship waste handling, nor does it recommend any specific model for how ship waste handling might or ought to be organised. This leaves room for different approaches within EU ports in terms of the role of private operators in waste handling operations, and cultural differences and traditions also appear to have influenced the situation in different Member States.

The majority of EU ports have outsourced part or all of their ship-waste handling operations to external private waste operators. Some ports chose one operator, selected through public tendering. Others opted for framework-contracts with various operators, which then provide the waste handling services according to market prices. In the latter case, some ports regulate the maximum level of tariffs and others leave it to the ship agents to identify waste operators in the free market. Another system in place is that ports or other authorities, such as environmental agencies, approve waste operators in advance, and then ports leave it to the shipping agents to decide which operators shall be contracted for a given waste handling service.

Many Northern European ports, including Scandinavian ports and the major ports along the English Channel, are deeply involved in ship waste handling. When port authorities play a central role they are likely to have a much deeper insight and provide a more transparent ship waste handling system. Some good examples of bigger ports deeply involved in ship waste handling are Antwerp, Rotterdam, Amsterdam, Copenhagen, Stockholm and Gothenburg.

EMSA (2012) attempted to investigate if there were any significant differences in waste delivery in ports using private waste operators compared to ports which carried out all or part of the waste operation themselves. The study could not identify any significant differences between the two approaches; however the sample of ports which did not employ private waste operators was very small.

With respect to the system chosen for ship-waste handling, ports can be grouped and distinguished according to the following levels of involvement:

A system where Port Authorities have decided to play a central role in ship-waste handling: they therefore manage both the ships (with respect to notification and invoicing) and the port reception facility operators (with respect to the organisation of and payment for waste delivery services). Under this system there is no direct contact between ships and waste operators, unless additional or special services are requested. Such a system seems to be the most transparent, since every party is aware of and accepts the procedures applied.

A system where the Port Authorities, for various reasons, do not take full responsibility for ship-waste handling: under such a system, the ports divide the responsibility for the collection and payment of waste between themselves and external operators, often based

on waste types. Fee collection and often also waste handling is taken care of by the ports, but waste oil is left as a matter for ship agents and waste operators to solve directly between themselves. This system is semi-transparent and may lead to confusion, since the ships and their agents have to deal with several contact points in the ports.

A system with little or no involvement from the Ports Authorities in ship-waste handling: under such a system the ports leave the collection and processing of all waste, as well as invoicing (except when an indirect fee is applied), to the ships and external operators to coordinate together. Even though the waste notification goes to the Port Authorities, it is often not used.

It seems likely that a port with strong involvement in ship waste handling will have a better overview of the waste handling operations. Equally, when port authorities contract out all activities regarding ship waste handling, they are no longer actively involved in the service and therefore they will be less informed.

In order for port authorities to improve their knowledge of the types and quantities of waste produced and how these elements are changing, they need to be better integrated in the information flows. Greater involvement of port authorities in ship waste handling could, therefore, include the control of the information and money flow. The Port Authority could be the central point for managing the notification form and distributing it to relevant stakeholders (i.e. waste operators and inspection authorities), receiving the waste fees, and paying waste operators based on their services provided.

To improve the waste handling system in European ports, it is recommended:

1. ***Guidelines should be developed under the PRF Directive for a more centrally managed ship waste handling system where the relevant port authority takes overall responsibility for:***
 - ***Planning of waste collection procedures and conditions for waste delivery (updated Port Waste Management plan/manual);***
 - ***Management of all in and out going waste fees;***
 - ***Payment of all private operators based on yearly price negotiations;***
 - ***Reception of all waste notification forms and distribution of these to relevant parties including inspection authorities, and***
 - ***Communication to relevant stakeholders.***

8 Efficiency of ship waste disposal and the 'one stop shop' approach

The PRF Directive does not dictate how ship waste handling should take place except by specifying that it must not cause any undue delay to ships. The PRF Directive requires clear description of waste handling procedures in waste handling plans (Annex I to the Directive) and in Article 12 'Accompanying measures' it states some requirements that Member States should introduce. However, the Directive leaves it to the ports to decide how they should organise waste handling. As a result EU ports have organised their waste handling in different ways, and this has often focused on the needs of the ports rather than those of the ships.

In some EU ports ships only call for a very short time period (e.g. 4-6 hours) before departing for the next port of call. Typically crew members prefer to use this time to rest. It is easy to see in these situations how crew members might lack the motivation needed to deliver ship waste to the waste operator or to carry waste bags to containers on the berth. It is clear given these time constraints that the delivery of waste to port is influenced by the efficiency of port services. If one port does not provide efficient and easy waste collection the ships might prefer to keep the waste on board until next port of call and then deliver the waste there. Worse still, inefficient waste collection creates a greater risk that waste is discharged illegally to sea.

In addition to the lack of time available to dispose of waste, the administration of waste disposal can be a burden and a disincentive to discharge waste. For example, in many EU ports a number of approved waste operators are available and the shipping agent has to be in contact with several authorities and waste operators in order to secure safe waste disposal of different types of waste. Thus the shipping agent has to fill out the waste notification form and then independently organise all waste collection.

In these ports the choice of operators contributes to the complexity of the ship waste system, therefore it would be more efficient if there were fewer or even just one operator appointed to receive waste. Not only would this reduce the burden for ships, but if fewer operators were available the 'information/paper flow' and 'money flow' would be easier for the responsible Port Authority managing the system to handle. The competitive element could be introduced through the selection process, i.e., via tendering.

In such a system the agent provides notification of what waste is to be delivered and the responsible authority then ensures that:

- The inspection authorities are informed;
- The waste operator(s) are informed;
- The waste is collected;
- A receipt is issued and signed by waste operator and ship captain, and
- The shipping agent is invoiced according to an existing price list or quotation (if needed).

There seem to be very few if any ports in Europe that have introduced a system where the waste handling is organised in a way where the shipping agent only has to liaise with one authority/operator. There are ports which have implemented elements of the 'One Stop Shop' approach, such as the ports of Rotterdam and Amsterdam, which have implemented an electronic waste registration into their overall IT system and some Scandinavian ports. It is therefore not possible to refer to ports with a 100 % 'One Stop Shop'.

Such a system would require waste handling to be organised differently in many European ports, but would ease the job of the ship/shipping agent, as they would not have to organise waste collection with the operators or negotiate the price with them. The ship/shipping agents are likely to consider this as a reduced administrative burden and regard it as an improved and more efficient ship waste handling system, which should lead to increased waste delivery.

As a result, the following recommendations are made:

- 1. To introduce a 'One Stop Shop' waste handling system in the implementation of the PRF Directive to ensure that:**
 - **Waste notifications are handled centrally by the responsible authority;**
 - **Arrangements for waste collection by private or public operator(s) are made by the responsible authority and communicated to all relevant stakeholders;**
 - **All payments are made through the responsible authority based on an agreed pricing structure with appointed waste operator(s); and**
 - **A receipt is issued duly signed by the ship captain and waste operator.**

- 2. Shipping agents would be informed of the pricing in advance and only have to provide a complete waste notification form rather than be involved in the administrative and ship waste planning work.**

It is important to note that some European ports would have to undergo substantial organisational rearrangements to allow these changes.

9 Strengthening the inspection regime regarding waste delivery

In many ports it is the Port State Control (PSC) authorities that inspect ships, including their oil and waste record books. Thus Directive 95/21/EC concerning the enforcement of international standards for ship safety, pollution prevention and shipboard living and working conditions (hereafter known as the PSC Directive) is also relevant. The evidence suggests that many European ports have insufficient inspection procedures for ships with respect to the delivery of waste (EMSA, 2012). The following chapter explores the main areas in which the inspection regime for ship generated waste might be improved.

The present legal framework defines a general obligation to carry out a sufficient number of inspections in coordination with the regulatory framework established by the PSC Directive. Article 11 (b) of the PRF Directive states that:

'such inspections may be undertaken within the framework of Directive 95/21/EC (the PSC Directive), when applicable; whatever the framework of the inspections, the 25 per cent inspection requirement set out in that Directive shall apply'

Thus, according to the PRF Directive, Member States should inspect 25 per cent of ship calls, and these may be undertaken within the framework of the PSC Directive. However, the legal framework on PSC has changed several times in recent years. In 2001 it was amended to focus more on pollution prevention and enforcement with respect to ships using Community ports and sailing in the waters under the jurisdiction of the Member States. The amendments also included international standards for ship safety, as well as shipboard living and working conditions. The PSC Directive itself was fully revised in 2009 (Directive 2009/16/EC), requiring a more risk-based approach to inspection based on ships of different 'priorities'.

Moreover, as of 1 January 2011 the Paris MOU introduced a new inspection regime to evaluate a vessel's risk profile, and through this determine the frequency of inspections. Vessels are categorised into three risk profiles (low, medium and high) determined by a number of factors, including previous inspection results, the number of detentions, and the performance of management companies, the flag state, and the classification society. Ships with a high risk factor present a particularly serious risk of accident or pollution. This justifies the need to inspect them more frequently when they call at an EU port.

There are several issues here. Firstly, the present legislative framework on PSC (the PSC Directive and the Paris MOU) mainly addresses issues related to safety, security of ships and working and labour conditions. Accordingly the inspections tend to prioritise these social issues and are not directed towards the prevention of illegal waste discharges. This trend has resulted in the inspections having little relevance to the PRF Directive. Secondly, since the Paris MOU introduced the new inspection regime there is an issue of policy coherence, given that the PRF Directive requires a 25 per cent inspection rate, and the MOU requires more targeted inspections based on level of risk.

Another issue with the inspection regime relates to the relationship between Port Authorities and PSC Authorities. In 2012 EMSA concluded that there is insufficient

communication between the responsible port authorities and the inspection authorities regarding the control of ships and their waste delivery. In part, this is due to the waste notification systems implemented in some ports. The study also concluded that in some ports, the port authority only receives the waste notification form for purposes of organising waste collection. They therefore do not take special interest in control and enforcement and often there are no clear procedures established for forwarding or copying the waste notification form to the relevant inspection authority. In some situations this only happens after the ships have left the port. It has been indicated that one reason for this is that ports see ships as their customers, and do not want to expose them to any 'unnecessary' trouble with inspection authorities. However, some ports such as Rotterdam and Amsterdam have implemented an electronic system where all information regarding ship waste handling is entered. This makes it easier for inspection authorities to log on to the system, have access to the relevant information, and monitor it for any discrepancies. Such discrepancies could relate to length of voyage and content of waste notification for example, or quantity of the waste in the notification form and that on the waste delivery receipt (i.e. what was actually delivered).

Another issue weakening the enforcement of the PRF Directive is the difficulty in obtaining strong evidence to bring ships suspected of illegal discharges to court. To counter this, some countries, for example Denmark, have decided to introduce 'administrative fines', which may be based on strong suspicion only. This means that the relevant national authorities will approach the suspected ship and issue an administrative fine, based only on a suspicion that the vessel has breached the regulations.

With regard to inspections, the following recommendations are made:

- 1. *The requirements for inspection with reference to the Port State Control Directive need to be updated in the light of changes since the original Directive was adopted in 1995.***
- 2. *Clear procedures for inspection authorities on how to carry out individual ship waste inspections and on requirements for reporting should be developed. These should focus on the improvement of the regulatory framework for notification, and the establishment of minimum requirements to ensure an effective inspection system. These procedures should include:***
 - *A transparent waste notification system (see earlier recommendations);***
 - *Clear identification of the responsible inspection authorities in the port;***
 - *A rigorous and systematic communication channel between the inspection authorities and the port authorities, including clear procedures for information flow regarding ship waste delivery to ensure that the inspection authority is able to inspect ships before departure if necessary. Such systems should be established using the best available data communication flow systems and software developed within the framework of EU research and innovation programmes;***
 - *Clearly defined selection criteria to inspect ships should be developed specifically related to SGW (potentially using the frequency of waste discharge as a factor), in order to better focus and increase the number of inspections according to Article 11 of the PRF Directive and the legal provisions of PSC Directive;***

- *The PRF Directive should be amended to better define the relationship between the inspections undertaken within the framework of the PSC Directive, and how the 25 per cent inspection requirement - or the new approach to inspect the ships according to the degree of risk set out in that Directive and its amendments - shall apply, providing more detailed information to the PSC authorities to carry out inspections on SGW.*
3. *Guidelines on inspection should be developed at EU level to better apply Article 11 of the PRF Directive. These guidelines should cover:*
- *selection criteria for inspection of ships (e.g. white list, black list);*
 - *definition of 'sufficient dedicated storage capacity for all ship-generated waste' according to Article 7 of the PRF Directive;*
 - *inspection procedures of certificates, record books on board, and other documents;*
 - *inspection procedures of the ship;*
 - *enforcement tools and means to oblige the ship to deliver waste in port; and*
 - *enforcement tools and means to detain the ship in port.*

10 Conclusions and next steps

The Port Reception Facility Directive came into force in 2002. Since then there has been an increase in waste delivery to Member State ports. Despite this increase there are still illegal discharges of ship generated waste into the sea.

It has become apparent that the Directive is not prescriptive enough in different aspects of its implementation and that clearer guidelines and stricter requirements would be desirable and beneficial for the environment and for ports. This is especially true regarding the cost recovery system, as the Directive leaves a lot of room for interpretation, which has resulted in many different systems being implemented across European ports, thereby creating an uneven playing field and allowing less than optimal systems to be implemented.

This study therefore recommends that the Directive should be revised to put a stronger focus on:

- The applied cost recovery system (degree of indirect fee);
- The efficiency of the waste notification system;
- The port authority involvement in ship waste handling (taking responsibility, control and monitoring);
- The 'one stop shop' approach, and
- The inspection regime in the port regarding waste delivery.

Ports must establish cost recovery systems to encourage the delivery of waste on land and discourage dumping at sea. All ships calling at a Member State port will bear a significant part of the cost (which the Commission interprets as meaning at least 30 per cent), whether they use the facilities or not. This cost recovery system comprises this built-in, fixed element and, possibly, a variable element according to the amount and type of waste actually delivered. However, the PRF Directive is vague at defining the fee/cost recovery system and leaves room for many interpretations. Consequently, with the present system it is impossible to create a level playing field for all ports. It is therefore recommended to define common criteria and precise rules to create a system (such as similar to the Baltic Sea no-special fee system) for the whole of Europe, which would remove to the greatest extent possible any disincentives to delivering waste to ports. The indirect fee in Baltic ports has been shown to reduce illegal discharges of oily waste significantly over the last 10-12 years, and there is every reason to believe it has had the same effect on illegal solid waste dumping.

Captains of ships covered by the Directive bound for a Community port are required to provide certain information, in particular the date and the last port in which ship-generated waste was delivered and the quantity of waste remaining on board. The Directive provisions appear adequate with respect to the format of the notification form. However, it is weak in that it does not provide indications concerning the transmission, information flow and communication means among ships/agents and competent authorities (ports/port authorities, maritime PSC authorities, inspection authorities). This means that in some ports the flow of information between authorities and operators is missing, negatively influencing the efficiency of the procedures for inspecting and controlling ships.

The role and involvement of the port authorities in waste handling also appears to play an important role. Where port authorities have a greater involvement in waste notification and management of the waste handling system, it appears to increase efficiency. Ports should also consider implementing a 'one stop shop' which will make life easier for the calling ships and the shipping agents, and incentivise proper waste disposal further.

When it comes to port inspection regimes, the PRF Directive is closely related to the Directive on Port State Control. The main weakness identified concerns the fact that inspections are mainly related with issues such as safety, security of the ships and working conditions of seafarers according to the IMO conventions, rather than on the prevention of illegal waste discharges. The PRF Directive could be improved by providing specific requirements to PSC Authorities to inspect ships when the Port Authorities identify suspect ships which have not duly fulfilled the notification procedures or which cannot demonstrate sufficient storage capacity. The provisions related to inspections must be closely linked to the improvements made to notification, more prescriptive provisions concerning communication between the responsible authorities, and definition of adequate/sufficient storage capacity.

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