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Environmentally sound management of ship wastes: challenges and opportunities for European ports

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Abstract

Ship wastes are incidentally regulated within the regime of marine pollution and the prevention of ship-source pollution is heavily reliant on the provision of adequate port reception facilities on land. However, the coordination between these facilities and further downstream management operations is still an unresolved issue. This paper examines from a legal perspective the challenges and opportunities related to the management of wastes generated on board vessels after they are discharged to port reception facilities. Ship wastes are studied from a European Union (EU) law perspective. Directive No. 2000/59/EC on Port Reception Facilities for Ship-Generated Waste and Cargo Residues regulates the reception of ship wastes on land and it offers a valuable opportunity to evaluate the integration of ship waste management within wider EU waste legislation and national waste management plans.

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1. Introduction

From a legal perspective, waste management has traditionally dealt with downstream disposal operations. A life-cycle approach, by contrast, offers a new perspective that involves every phase, *i.e.*, from the prevention and reduction of waste generation to the actual handling of wastes. Waste handling includes the collection, transport, monitoring, and treatment (re-use, recycling, energy recovery, and final disposal, *e.g.*, landfill) of wastes including the after-care of waste facilities. The main legal challenges of applying a life-cycle approach to waste management are twofold. First, waste management is regulated incidentally, *i.e.*, within media-specific pollution regimes, *e.g.*, sea, air, land-based pollution; or in relation to hazardous substances, *e.g.*, regulation of persistent organic pollutants (POPs). In cases where

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wastes are directly regulated, this regulation is concerned with a particular activity, *i.e.*, transboundary movements or dumping. The incidental regulation of wastes involves a risk of transfer of pollution from one environmental medium to another, resulting in fragmentation. Such fragmentation produces a lack of coordination between different regimes and the proliferation of conflicting and inconsistent legal obligations. The second challenge is that waste management has been traditionally considered as a national affair except in cases dealing with pollution transfer and transboundary movements of wastes. Within this traditional legal perspective, States are virtually free to generate and to dispose of wastes as they see fit, so long as such wastes do not cause harm beyond their national jurisdiction [1].

To address the challenges involved in the regulation of waste, this paper is concerned with the management of wastes generated on board vessels (through machinery, cargo, and living spaces) after they are discharged on land to port reception facilities. Ship wastes were chosen because they are incidentally regulated within the regime of marine pollution. At the international level, ship wastes are governed by the International Convention for the Prevention of Pollution from Ships 1973 as Modified by its 1978 Protocol (hereafter MARPOL). The consequence has been the development of a preventive regime that strictly regulates harmful substances (including wastes) while at sea, restricting discharges in the marine environment. Focusing on the prevention of pollution in specific environmental media (*e.g.*, the sea) leaves little room for a life-cycle waste approach in relation to the management of wastes once they are discharged on land. Consequently, there is a risk of transforming ship-source marine pollution into land-based pollution.

Additionally, the prevention of ship-source pollution is heavily reliant on the provision of adequate port reception facilities for the discharge of wastes that otherwise would end up in the sea. The Parties to this treaty, however, have been reluctant to develop the meaning and extent of the obligation related to the provision of port reception facilities [2, 3] and the relationship between these facilities and further downstream management operations. Such reluctance could be understood from the traditional legal approach towards “domestic wastes,” *i.e.*, once wastes are discharged on land, States manage these wastes at their discretion.

At EU level, Directive No. 2000/59/EC on Port Reception Facilities for Ship-Generated Waste and Cargo Residues regulates ship wastes giving substantial content to the obligation to ensure the provision of adequate port reception facilities. Directive No. 2000/59/EC offers a valuable opportunity to evaluate the integration of ship waste management within wider EU waste legislation and national waste management plans.

2. Port Reception facilities: Interface regulation between international and EU Law

2.1. The relationship between MARPOL and Directive 2000/59/EC

What triggered the adoption of Directive 2000/59/EC on Port Reception Facilities was a growing frustration at the lack of enforcement mechanisms of MARPOL’s standards. The immediate catalyst, however, was the *Erika* affair^b [4]. Directive 2000/59/EC was welcomed as a way of implementing MARPOL because unlike international law, EU legislation is supported by non-compliance mechanisms against EU Member States. In fact, several States including Finland, Germany, Greece, Italy, and Spain have been brought by the Commission before the Court of Justice of the European Union for not complying in time with the obligations set forth in Directive 2000/59/EC [5-9]. Furthermore, Directive 2000/59/EC establishes additional binding obligations that have no parallel in MARPOL, with regard to: a) waste reception and handling plans; b) mandatory discharge criteria for ship-generated wastes; c) cost recovery systems, among others. These novel obligations follow, to some extent, soft law instruments adopted under the auspices of the International Maritime Organization (IMO)[10], and as such they could be seen as an effort to complement international obligations that do not *per se* compete with their international counterparts.

^b In 1999, the Maltese single-hull tanker, *Erika*, “broke in two and sank in the Bay of Biscay ... France. The tanker was carrying a cargo of 31,000 tonnes of heavy fuel oil, of which some 19,800 tonnes were spilt at the time of the incident ... Approximately 400 km of shoreline was affected by the oil, and the incident gave rise to nearly 7,000 claims for compensation for the cost of clean-up operations, other pollution preventive measures and economic losses sustained in the fishing and tourism industries.” Rue, C.D.L. and C.B. Anderson, *Shipping and the Environment: Law and Practice*. 2nd Edition ed. 2009: Informa Law. 1247.

Since the objective of Directive 2000/59/EC is to strengthen MARPOL no serious doubts have been raised over the legitimacy and compatibility of the Directive *vis-à-vis* MARPOL. The EU is not a Party to MARPOL, and in principle the Convention is not binding for the EU^c. Nonetheless, MARPOL is not inconsequential within the EU legal order. The implementation of certain MARPOL obligations within Directive 2000/59/EC has a direct impact on how EU Member States comply with their international obligations, and it also has an effect on non-EU ships calling at EU ports. Furthermore, in the *Intertanko* case [11], the Court of Justice of the European Union recognized that in light of the customary international law principle of good faith, MARPOL is relevant for the interpretation of EU secondary legislation falling within the scope of MARPOL's application. The following sections pursue the aforementioned logic with which Directive 2000/59/EC is interpreted taking MARPOL into account.

2.2. EU competence as a 'Port State'

Article 211(2) of the United Nations Convention on the Law of the Sea (LOSC), prescribe that regulations concerning the prevention of ship-source pollution "shall at least have the same effect as that of generally accepted international rules and standards established through the competent international organization," *i.e.*, MARPOL. From the text of this provision, States are in principle allowed to adopt stricter regulations and enforce them on ships flying their flags. However, regulations of a third State may be applicable to ships voluntarily entering a port of that third State. Ports are located in internal waters, and this maritime zone is closely assimilated to land territory. This means that States exercise territorial sovereignty and, consequently, have full legislative and enforcement jurisdiction.

Considering the territorial nature of internal waters, under customary law prior to the LOSC, port States could legislate ship-source pollution for foreign vessels. For this reason, Port States can demand the compliance of ship-source pollution legislation as a condition to allow ships entering into ports as States. In this sense, the LOSC does not modify the legislative jurisdiction of Port States. Indeed, Articles 25 (2) and 211 (3) confirm the right of Port States to prescribe conditions to access their ports and their offshore terminals. In case of ship-source pollution, such conditions must be communicated to the IMO and Port States shall give due publicity of such requirements.

Overall, in the absence of a customary law right of access to ports,[12, 13] it is generally accepted that States can impose certain obligations on ships, *e.g.*, the master, the ship operator, voluntarily entering their ports. Controversies over port State jurisdiction pertain not to the existence of such ample jurisdictional powers, but rather to their limits according to public international law. The jurisdictional powers and limits of port State jurisdiction in general and the EU in particular have been discussed elsewhere.[14-16] Suffice it to note here that the EU is increasingly making use of their jurisdictional powers as port States to impose obligations on ship operators. Such obligations not only complement international obligations, but also establish standards that compete with their international counterparts. [14, 16] Limits of Port States jurisdiction must be analyzed on a case by case basis and in the light of specific treaties and general principles of international law, including good faith, proportionality, reasonableness, and non-discrimination.[13]

3. Ship wastes

Unlike MARPOL, which refers, in general terms, to harmful substances^d Article 2(c) of Directive 2000/59/EC on Port Reception Facilities explicitly employs the terminology of "ship-generated waste" in reference to residues regulated under MARPOL's Annexes I, IV and V, *i.e.*, oil, sewage, and garbage. Other wastes regulated by the Directive include "cargo residues" defined in Article 2(d) as "remnants of any cargo material on board in cargo holds

^c "It is true that all the Member States of the Community are parties to MARPOL 73/78. Nevertheless, in the absence of a full transfer of the powers previously exercised by the Member States to the Community, the latter cannot, simply because all those States are parties to MARPOL 73/78, be bound by the rules set out therein, which it has not itself approved." *C-308/06, Intertanko and Others in ECR I-4057; ECLI:EU:C:2008:312*. 2008, Court of Justice of the European Union.

^d MARPOL does not employ the terminology of "wastes." It refers in general to harmful substances, which include residues from cargo, machinery, and living spaces of a ship. *See* Article 1 (1) of MARPOL.

or tanks which remain after unloading procedures and cleaning operations are completed and shall include loading/unloading excesses and spillage.” These wastes include substances regulated under MARPOL’s Annexes I and II. There is an important caveat in relation to MARPOL Annex V, *i.e.*, garbage. This Annex was comprehensively revised in 2011 [17] when new categories of garbage were developed, including “cargo residues.” Regulation 1 (2) of said Annex defines cargo residues as:

any remnants of any cargo which are not covered by other Annexes to the present Convention and which remain on the deck or in holds following loading or unloading, including loading and unloading excess or spillage, whether in wet or dry condition or entrained in wash water but does not include cargo dust remaining on the deck after sweeping or dust on the external surfaces of the ship.

According to Article 7(1) of Directive 2000/59/EC, mandatory discharge standards are only applicable to ship-generated wastes, but not to cargo residues. The category of “cargo residues” under MARPOL, Annex V, could potentially create difficulties for port users calling at an EU port, since it is not entirely clear whether those wastes are subject to mandatory discharge criteria. However, all residues under MARPOL, Annex V, must be considered ship-generated wastes for the purposes of Directive 2000/59/EC.[18]

Practical reasons triggered the distinction between ship-generated wastes and cargo residues. Cargo residues come from a vast variety of cargoes, *e.g.*, hazardous chemicals. Some residues remain property of the cargo owner. Others require specialized facilities for collection, storage, and treatment.[19] As such, it is common practice for ship operators to contact private waste management operators with little or no involvement of the port authorities. In fact, port authorities in Europe generally consider that cargo residues are somehow outside the scope of their responsibilities, placing accountability on the ship operator and the “individual terminal.” [19, 20]

Article 6 of Directive 2000/59/EC obliges shipmasters to notify in advance the amount of ship-generated wastes *and cargo residues* to be delivered at port reception facilities or that are kept on board before entering an EU port. Such information must be available to the relevant authorities. Despite this obligation, the communication between the port authorities and the individual terminals regarding cargo residues is limited.[21] This has a negative impact on the implementation and enforcement of Directive 2000/59/EC. If the relevant authorities have little or no knowledge of cargo residues, it is not possible for them to assess whether ships are complying with their discharge obligations as provided in Articles 10 and 11 of Directive 2000/59/EC. Moreover, the lack of information also hinders the compliance of obligations set out in the Waste Framework Directive, including the obligation to ensure the traceability of hazardous wastes. Overall, the control and monitoring of the reception and further management of cargo residues on land are weak.

The distinction between ship-generated waste and cargo residues has generated complications for port users. Shipmasters find difficulties in assessing the different categories of wastes according to MARPOL and Directive 2000/59/EC. In fact, shipmasters are subject to different notification forms depending on whether they call at an EU port or a port located elsewhere.[22] For this reason, in 2015, the notification form set forth in Directive 2000/59/EC was amended.[23] The amended form follows closely the IMO Advanced Notification Form for Waste Delivery to Port Reception Facilities.[24] This amendment aims to avoid administrative burdens for port users as well as reflect the amendments of MARPOL, Annex V. It is expected that ships notify the quantities of wastes “actually delivered at port.” The information could potentially be used to develop waste management plans.

4. The relation between ship wastes and wider EU waste legislation

Considering life-cycle approaches towards waste, *i.e.*, from prevention to final disposal, there is a growing awareness that ship wastes cannot be handled in isolation from other “land wastes”. According to Article 2 of Directive 2000/59/EC, ship-generated waste and cargo residues shall be considered wastes within the meaning of Article 3(1) of the Directive 2008/98/EC on Wastes (hereafter Waste Framework Directive). This provision becomes relevant for the management of wastes once they are discharged to port reception facilities since while on board vessels, the management of these substances, including their accidental and operational discharges, are in principle governed by MARPOL.

Everything that is not governed by Directive 2000/59/EC will be subject to the Waste Framework Directive. Directive 2000/59/EC provides for the collection of wastes at port reception facilities, but management activities related to transport, recycling, re-use, recovery, and final disposal operations must follow the Waste Framework Directive and other relevant EU waste legislation. General duties set forth in the Waste Framework Directive must also guide the application of Directive 2000/59/EC, including the protection of human health and the environment as established in article 13. States are obliged to adopt measures so as to achieve such a general duty. This obligation was subject to judicial scrutiny in the *Comitato di Coordinamento per la Difesa della Cava and Others v. Regione Lombardia and others* case. The Court of Justice considered that this provision had no direct effect since it does not provide for “specific measures or a particular method of waste disposal. It is therefore neither unconditional nor sufficiently precise and thus is not capable of conferring rights on which individuals may rely as against the State.” [25, 26].

4.1. Waste hierarchy

The management of ship wastes must also follow the waste management hierarchy, that is, the priority order that ranks “waste prevention” as the most desirable option followed by preparation for re-use, recycling, other recovery operations and final disposal. In the REFIT^e evaluation [27] of Directive 2000/59/EC, the European Commission noticed that waste reception and handling plans developed by EU ports do not clearly reflect how the waste management hierarchy in general and waste prevention in particular are included in such plans [22].

The EU has taken certain subtle actions to prevent and minimize ship-generated waste, without establishing obligations related to on-board operations, equipment, or ship design. Article 8(2)(c) of Directive 2000/59/EC prescribes that fees for ship-generated wastes “may be reduced if the ship’s environmental management, design, equipment and operation are such that the master of the ship can demonstrate that it produces reduced quantities of ship-generated waste.” Although Member States have implemented such provision, few EU ports apply it [21] because in the absence of minimum criteria regarding actual on-board practices and potential waste handling mechanisms to reduce the generation of wastes, the provision remains of limited utility. In 2017, EMSA commissioned a study regarding on-board waste management treatments, methods, and technologies used to reduce the quantities of ship-generated waste [28]. Given that Directive 2000/59/EC is being revised, the gathering of these data could inform the revision of this Directive in several ways. First, for every type of ship-generated waste, the Directive could include an Annex related to best available techniques that could serve as a basis on which to demonstrate waste minimization, and consequently ship operators may benefit from a reduced fee while using port reception facilities. Second, the EU can also introduce direct obligations relating to on-board practices to secure the prevention of ship-generated waste for vessels bound for EU ports. If these practices follow, for example, IMO recommendations in the field of waste prevention,^f binding obligations could become a welcome development. Such a legislative approach could also exert pressure for the adoption of binding regulations at the international level. The history of MARPOL shows that States are more inclined to adopt strict regulations to improve on-board management practices and technological equipment of ships, rather than imposing obligations on the actual provision and functioning of port reception facilities. [2, 3]

^e “REFIT is a key component of the Commission’s Better Regulation Agenda.” It is a mechanism to assess EU legislation “through a system of impact assessments, retrospective evaluations and stakeholder consultations.” European Commission. *REFIT: Making EU lighter, simpler, and less costly*. 2016 [cited 2017 19 April]; Available from: http://ec.europa.eu/smart-regulation/docs/refit_brochure_en.pdf. last accessed 4 July 2018.

^f MARPOL does not contain any explicit obligation to minimize waste. However, the IMO considers that waste management strategies should follow the waste hierarchy. Indeed, the IMO recommends port users to minimize ship wastes. It has also suggested the adoption of ISO 21070: management and handling of shipboard garbage.

4.2. Waste reception and handling plans

According to article 5 of Directive 2000/59/EC, ports either individually or in a regional setting must develop waste reception and handling plans. The integration of port reception facilities within the broader context of waste management requires that port waste reception and handling plans are adopted and monitored considering national waste management plans set out in Article 28 of the Waste Framework Directive. [23] Although each EU Member State has national waste management policies, the Waste Framework Directive includes several indications of the content of such plans. National waste management plans should be instrumental in achieving a coherent EU waste policy. [29] However, some commentators believe that EU waste policy is still inconsistent and subject to “political divergence within the European Union.” [30]

4.3. Waste separation

Separate collections of wastes may be necessary to ensure those wastes undergo recovery operations according to the Waste Framework Directive 2008/98/EC.^g Port users and providers of port reception facilities encounter difficulties in waste separation and collection, since waste legislation among EU Member States varies considerably. [21] These differences are likely to persist for two reasons. First, standards for separate collection of waste differ between jurisdictions since the Waste Framework Directive 2008/98/EC leaves Member States with greater discretion for setting up such separate collections. Regarding recovery and recycling, Articles 10 and 11 provide, respectively, that wastes must be collected separately if “*technically, environmentally and economically practicable.*” The Directive also includes specific obligations for the separation of waste oils^h and paper, metal, plastic, and glass. Second, the legal basis of the Waste Framework Directive 2008/98/EC is Article 192 TFEU. Consequently, and in accordance with Article 193 TFEU, there is no obligation of full harmonization, and States are entitled to enact more stringent measures. The limit, however, is that those “measures must be compatible with the Treaties.”

Port users and the providers of port reception facilities face further difficulties since waste classification, set out in MARPOL and Directive 2000/59/EC, is not always equivalent to the categories of waste legislation on land. [21] The classification of wastes varies from one jurisdiction to another, and as such, it is necessary that port waste reception and handling plans include guidelines for providers of port reception facilities to identify the equivalent categories according to waste legislation on land. Currently, Annex I of Directive 2000/59/EC requires that waste reception and handling plans incorporate a “summary of relevant legislation.” Such a summary is not entirely adequate without describing how the relevant legislation relates to ship-generated waste and cargo residues.

The management of ship-generated waste and cargo residues does not require dedicated treatment installations. Although some ports may have some pre-treatment or treatment operations, [20] external private operators are usually in charge of both collection and treatment of ship-generated wastes and cargo residues. [20] Article 12(1)(g) of Directive 2000/59/EC provides that the recovery or disposal of ship-generated waste and cargo residues must be carried out in accordance with the Waste Framework Directive 2008/98/EC. As discussed in this section, the collection, storage, transport, and treatment of ship waste must follow the waste management hierarchy. However, waste reception and handling plans in several ports of the EU “focus primarily on the disposal of waste, even for waste types that could easily be recycled.” [21]

Favoring disposal stems from a lack of segregation of waste on board vessels or at port reception facilities (*e.g.*, garbage is not separately collected), [21] as well as the wide discretion that Member States exercise in choosing waste treatment options. For specific waste streams, Article 4(2) of the Waste Framework Directive 2008/98/EC gives Member States the capacity to depart from the priority order established in the waste management hierarchy if it is justified from a life-cycle approach. The strict application of the hierarchy may involve higher risks for the environment and human health. In this case, it is reasonable to depart from the priority order. [31] In practice, however, Member States choose – more or less freely – whether wastes are going to be composted, recycled, incinerated, or

^g See Articles 10, 11 and 21(1)(a) of the Waste Framework Directive 2008/98/EC.

^h See Article 21(1)(a) of the Waste Framework Directive 2008/98/EC.

landfilled. For this reason, some scholars consider that the waste management hierarchy resembles more a recommendation than a binding obligation. [30] [32] The European Commission deems such a hierarchy as binding, albeit subject to a certain degree of flexibility. From the wording of Article 4(1) of the Waste Framework Directive 2008/98/EC, it appears that following the waste management hierarchy is a legal obligation since States “shall apply” this priority order in their waste policy and legislation. Thus, Article 4(1) imposes a legal constraint, [33] but the exceptions to deviate from the hierarchy provided in Article 4(2) are so wide that in practice the enforcement of such an obligation is extremely difficult.

4.4. Waste oils, hazardous wastes and recovery targets

Other obligations of the Waste Framework Directive 2008/98/EC that are particularly relevant for ship wastes pertain to: a) waste oils, *e.g.*, ship-generated wastes from MARPOL Annex I – oil; b) separate collection and recovery targets for paper, metal, plastic, and glass, *e.g.*, ship-generated waste from MARPOL Annex V – garbage; and c) hazardous wastes, *e.g.*, cargo residues from MARPOL Annex II – harmful substances carried in bulk. Subject to certain exemptions, waste oils must be collected separately, and these wastes shall not be mixed with other wastes or with waste oils of different characteristics. Furthermore, Member States could enact laws regarding the regeneration of waste oils.ⁱ Member States are obliged to set up separate collections for paper, metal, plastic, and glass, and by 2020 the preparation for re-use or recycling of these waste materials must increase to at least 50 percent by weight.^j These obligations are especially difficult to implement in respect of the management of ship-generated wastes from MARPOL Annex V, *i.e.*, garbage, because many port reception facilities are not usually “supportive of the on board separation efforts of solid waste.” [21] The lack of waste segregation on board and at port reception facilities limits the possibility of waste recovery.

In terms of hazardous wastes, Member States are obliged to ensure their traceability, in accordance to Article 17 of the Waste Framework Directive 2008/98/EC *i.e.*, from production to final treatment. To this end, producers and operators, including dealers and brokers, who collect and transport hazardous wastes must keep records detailing the quantity, nature, mode(s) of transport, destination, and treatment method of the waste. In port reception facilities, the *traceability* of hazardous wastes, *e.g.*, cargo residues, is problematic since port authorities are generally not involved in any stage of hazardous waste management, *e.g.*, collection and transport. Even though Article 6 of Directive 2000/59/EC obliges shipmasters to provide information on ship wastes to the designated authority, EU ports generally lack adequate systems to collect, exchange, and monitor information regarding ship wastes in general and cargo residues in particular. [22]

Overall, the inclusion of ship-generated waste and cargo residues as wastes within the meaning of wastes set out in the Waste Framework Directive 2008/98/EC is not enough to provide an adequate basis to achieve the environmentally sound management (ESM) of ship wastes. It is necessary to reflect how these particular obligations could indeed be applicable to ships wastes. This section has discussed some of the challenges in relation to the alignment of Directive 2000/59/EC on port reception facilities with wider EU waste legislation. The Commission enacted guidelines for the interpretation of this Directive and it aims to provide assistance on how this Directive relates to EU waste legislation, specifically the Waste Framework Directive 2008/98/EC. [18]

5. Port reception facilities: obligations and current challenges

This section provides an analysis of specific obligations related to the provision and operation of European port reception facilities. In addition, this section examines the difficulties faced by States in the implementation of their obligations and the challenges associated with the ESM of wastes on land.

ⁱ See Article 21 of the Waste Framework Directive 2008/98/EC. Regeneration of waste oils means, according to Article 3(18) of this Directive, “any recycling operation whereby base oils can be produced by refining waste oils, in particular by removing the contaminants, the oxidation products and the additives contained in such oils.”

^j See Article 11 (1) and (2)(a) of the Waste Framework Directive 2008/98/EC.

5.1. *Waste reception and handling plans*

According to Article 6 of Directive 2000/59/EC, Member States must develop – whether individually or in a regional context – waste reception and handling plans for ship-generated waste and cargo residues. The development of such plans on a regional basis does not imply, however, that States enjoy the right to provide port reception facilities on a regional basis as well. On the contrary, port reception facilities must be available at every single port considering, for instance, the types of ships that regularly call at a port. This is consistent with MARPOL that requires the availability of adequate port reception facilities at port level.

Annex I of Directive 2000/59/EC details the content of waste reception and handling plans. This Annex includes mandatory and optional requirements. It is obligatory to include: a) an evaluation of the facilities required to satisfy the needs of ships usually calling at a particular port; b) a description of the type and quantities of ship-generated wastes and cargo residues received on land; c) a description of the technical capacity of facilities including the procedures for reception and collection of ship wastes; d) a description of the cost recovery system; e) mechanisms to report alleged inadequacies of port reception facilities, among others.

From a practical point of view, the assessment of the type of facilities needed should ideally be based on available data regarding the size and location of the port, volume of traffic, type of vessel calling at the port, and the amount of wastes actually received. [18] However, the vast majority of plans do not describe the type and quantities of ship-generated waste and cargo residues that are received at port reception facilities. [18] This is the result of poor collection data mechanisms at port level, and where this information is available, port authorities do not make use of it. [21]

According to Article 6 and Annex II of Directive 2000/59/EC, shipmasters, bound to an EU port, are obliged to notify the type and amount of ship-generated waste and cargo residues “to be delivered and/or remaining on board.” However, for many port authorities, collecting this information may be burdensome, especially where electronic means are not available. [34] To simplify data collection and to reduce administrative burdens for port authorities and shipmasters, from June 2015, EU Member States must “accept” that certain reporting obligations are transmitted electronically through a “single window” in accordance with Article 5 of Directive 2010/65/EU on reporting formalities for ships arriving in and/or departing from ports of the Member States.

If these electronic means are indeed implemented, they could simplify the systematization and analysis of such data. It could also enhance the harmonization of data to assess, for example, the quantities and type of ship-generated waste not only at port level, but also at regional or EU level. The benefits of implementing the electronic means set forth in Directive 2010/65/EU are already noticeable in the Baltic Sea area. Currently, several ports have access to information on cargo residues because such information is notified through national single windows. [34] However, there are still problems with the management of the data collected. Many ports that collect the required information “act on the basis of their own data needs, using their own units of measurement.” [34] Collecting and making use of the information on ship wastes that are actually received at port reception facilities is vital not only in developing waste reception and handling plans, but also in monitoring and enforcing Directive 2000/59/EC in accordance with its Article 12(3).

It is particularly challenging to evaluate whether waste reception and handling plans are integrated into national waste management systems. In principle, national waste management plans should be a good basis on which to evaluate the plans developed at port level. The information included in waste reception and handling plans, however, does not reflect whether the general duties set forth in the Waste Framework Directive 2008/98/EC inform their development and implementation, e.g., the waste management hierarchy, separate collection of wastes, and obligations related to waste oils and hazardous wastes. Annex I of Directive 2000/59/EC includes optional requirements that should be included in waste reception and handling plans including, for example, “a description of how the ship-generated waste and cargo residues are disposed of.” But such a general description fails to address how the disposal of ship wastes relates to other areas of EU waste law.

5.2. *Mandatory discharge criteria for ship-generated waste*

Article 7 of Directive 2000/59/EC provides that ships calling at an EU port must deliver all ship-generated waste to port reception facilities before leaving said port. From the wording of this provision it is uncertain whether operational discharges at sea (which MARPOL allows) are still legal for ships calling at an EU port. According to the Commission,

Directive 2000/59/EC aims at supporting the full implementation of MARPOL “instead of introducing new discharge rules for ships.” [35] Thus, it is reasonable to conclude that this provision establishes a binding obligation for ships in ports, which does not affect the operational discharge standards established in MARPOL. However, the position of the Commission seems to have changed. In the interpretative guidelines of Directive 2000/59/EC, the Commission takes a bold yet cautious step towards a zero-discharge standard, by stating:

the overall delivery requirement should be interpreted in the light of the Directive’s objectives of reducing ship-generated waste into the sea and enhancing the protection of the marine environment. Therefore, the Commission takes the view that what is allowed to be discharged under MARPOL cannot be automatically excluded from the delivery requirement in the Directive. [18]

If this policy is actually pursued, such action will disrupt the jurisdictional framework prescribed in the United Nations Convention on the Law of the Sea, since it would be an attempt to extend legislative jurisdiction beyond internal and territorial waters because many operational discharges allowed by MARPOL occur beyond 12nm from the nearest land.

If adequate port reception facilities are available and enforcement mechanisms are in place, e.g., port State control, then establishing compulsory discharge criteria is an effective mechanism through which to avoid illegal discharges at sea. There is, however, an exception regarding the general obligation to discharge ship-generated wastes at port reception facilities. According to Article 7(2) of Directive 2000/59/EC, if there is “sufficient dedicated storage capacity,” the ship may keep on board the ship-generated waste and proceed to the next port of call regardless of whether this port is within the EU. Port authorities face many difficulties in assessing whether ships have sufficient dedicated storage capacity. Empirical evidence shows significant differences in the application of this provision between EU Member States, whereby interpretation is left to the discretion of port authorities. [21] Considering that the general provision demands that all ship-generated waste is delivered at port reception facilities, the exception cannot become the rule, and the application of such an exception must be strict. Nonetheless, port users fear that using port reception facilities in every port instead of keeping wastes on board could increase their operational costs. [21] The needs of port users must also be taken into account when applying the mandatory discharge criteria because it can translate into an incentive to discharge ship-wastes at sea, or to deliver them to a cheaper facility – whether “adequate” or otherwise.

Dedicated storage capacity is not, however, the only relevant aspect when evaluating whether a ship is exempt from the application of the mandatory discharge criteria. Article 7(2) of Directive 2000/59/EC prescribes:

[i]f there are good reasons to believe that adequate facilities are not available at the intended port of delivery, or if this port is unknown, and that there is therefore a risk that the waste will be discharged at sea, the Member State shall take all necessary measures to prevent marine pollution, if necessary by requiring the ship to deliver its waste before departure from the port.

This article imposes a precondition to allow a vessel to proceed to its next port of call and that inevitably requires a case-by-case analysis based on general information available to port authorities. If the next port of call is outside the EU, this article raises some theoretical questions regarding extra-territorial jurisdiction since the provision calls for the assessment of the “adequacy” of port reception facilities located in another jurisdiction. However, the provision is of such a general nature that it can hardly be construed as an interference of the sovereignty or territorial integrity of other States. The situation will be different if Member States intend to monitor, supervise, or exercise control activities on port reception facilities outside their jurisdictions. From a practical point of view, it is unlikely that this article will raise many questions since several jurisdictions outside the EU avoid imposing mandatory discharge provision because the management of wastes on land is an additional burden. So, the provision could be seen as a welcome development that could potentially avoid not only marine pollution, but also the transformation of one form of pollution into another, by avoiding the discharge of wastes in jurisdictions that still face challenges over the provision of port reception facilities.

Article 9(1) of Directive 2000/59/EC contains another exemption from the application of the mandatory discharge criteria for ships “engaged in scheduled traffic with frequent and regular port calls and there is sufficient evidence of

an arrangement to ensure the delivery of ship-generated waste ... in a port along the ship's route." This exception could be granted in cases where the cost recovery system of port reception facilities is based on contracts and the payments for delivering wastes are made on a monthly or annual basis, for instance. However, several port authorities lack access to relevant information that could provide evidence of such arrangements. [21] Such relevant information includes, but is not limited to, contracts and receipts showing that such contractual arrangements are still valid. [18] This provision aims to prevent any undue burdens for port users and port authorities in cases where a vessel has recurring journeys between identified ports. The provision is silent on whether the exemption applies to a specific journey or is valid for a limited period of time while the vessel is engaged on the same scheduled traffic and while the arrangement for delivery of ship-generated wastes remains valid. Considering the rationale behind the establishment of such provision, it is reasonable to conclude that a port authority will provide an exemption for a determined period of time.

5.3. Discharge criteria for cargo residues

Article 10 Directive 2000/59/EC does not impose mandatory discharge criteria for cargo residues, which must be discharged in accordance with MARPOL standards. MARPOL does not specify where or when "cargo residues" must be discharged. This means that ship operators can freely choose the port reception facility where they will discharge the residues. There are two exceptions to this general rule:

- Ships carrying substances, "which through their physical properties inhibit effective product/water separation, and monitoring, including asphalt and high-density oils," must discharge their residues at the unloading port.^k
- Ships carrying MARPOL, Annex II, substances of category X need to pre-wash their tanks and discharge the residues at the unloading port. If substances of categories Y or Z are not unloaded following the procedures established in Appendix IV of MARPOL, Annex II, tanks must also be pre-washed.^l However, if ships load the same substance, the relevant authority could make an exception for a pre-wash.

In general, dedicated terminals receive cargo and cargo residues with little or no involvement from port authorities[20]. Thus, the relevant authorities are not in charge of making exemptions from required pre-washes, for instance, leaving this responsibility to the terminal. In the absence of information exchange between port authorities and terminals, it is difficult to assess how port authorities verify that ships are complying with the discharge criteria established in MARPOL, Annex II, and the procedures concerning the cleaning of cargo tanks, the discharge of residues, ballasting, and deballasting.

5.4. Cost recovery system

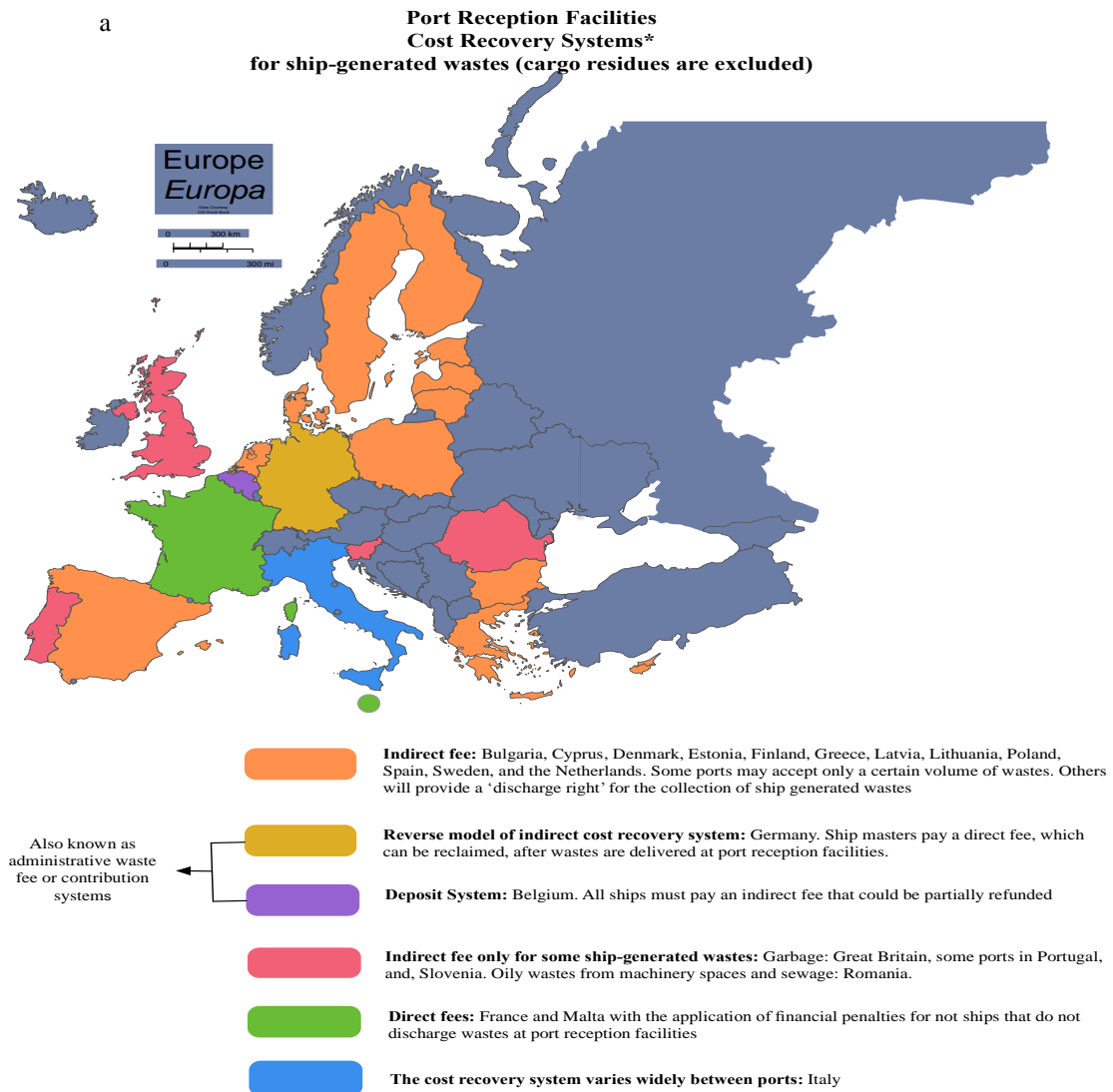
Directive 2000/59/EC adopted the polluter pays principle that serves as the basis for establishing cost recovery systems. Day-to-day operations of port reception facilities generate environmental externalities derived from the reception and management of ship-generated wastes. These externalities must be internalized by port users, i.e., ships, rather than by other members of society. Concerning ship-generated wastes, Article 8(2) of Directive 2000/59/EC provides for the application of a combined cost recovery system, which incorporates both an indirect cost recovery mechanism in addition to an extra direct fee. In relation to cargo residues, Article 10 of Directive 2000/59/EC provides for a direct fee system.

Concerning the combined recovery system, Article 8(2)(a) of Directive 2000/59/EC provides that all ships calling at an EU port must "contribute significantly to the costs" for the reception and treatment of ship-generated wastes. The costs can be included in port dues or as separate waste charges. The establishment of such a fee is based on several parameters, e.g., ship type, size, on-board equipment, crew and/or passenger number, the type of ship-generated waste

^k See regulation 2.4 of Annex I, and numerals 7 and 62 of the Unified Interpretations of Annex I of MARPOL.

^l See regulations 13.6 and 13.7. of MARPOL, Annex II.

and the required treatment. According to the Commission, “significantly” means that the fee should cover at least 30 percent of the costs. Nonetheless, Member States have considerable discretion in deciding what should be deemed a significant contribution. The payments are made regardless of whether a ship uses a port reception facility. In other words, the provision establishes an indirect cost recovery system that aims to discourage the discharge of wastes at sea by allocating costs “over the community of users collectively.” [36] The implementation of this provision varies considerably among EU Member States and, in some cases, significant differences are also found at port level.[20] The following graphic summarizes general trends regarding cost recovery systems around Europe:



*Sources: European Maritime Safety Agency (EMSA). "Final Report: Emsa Study on the Delivery of Ship-Generated Waste and Cargo Residues to Port Reception Facilities in Eu Ports." In *EMSA/OP/06/2011*, August 2012.
European Maritime Safety Agency (EMSA). "Horizontal Assessment Report - Port Reception Facilities (Directive 2000/59/Ec)." December 2010.

Fig. 1. (a) Port reception facilities – cost recovery systems

A direct fee system governs the reception and management of cargo residues. In relation to cargo residues subject to MARPOL, Annex II, the establishment of an indirect fee system may be difficult, given: a) the variety of cargo residues and the specialization required for their management; and b) the lack of knowledge by port authorities regarding the type and quantities of cargo residues that ships actually discharge at port reception facilities.

Empirical evidence demonstrates that port reception facilities receive fewer quantities of wastes if 100 percent direct fee systems are in place [21, 22]. Therefore, indirect or combined cost recovery systems should be preferred to avoid creating incentives for ships to discharge wastes at sea. In cases where direct recovery systems are in place, mandatory discharge criteria must also be implemented and coupled with effective monitoring and enforcement mechanisms not only to prevent illegal discharges, but also to avoid competitive distortions between ports. In the case of cargo residues, where direct fee systems are implemented, establishing framework contracts with waste operators could enhance monitoring activities regarding this type of waste, as well as improving communication channels between port authorities and waste operators.

5.5. Enforcement activities

According to Article 11 of Directive 2000/59/EC, port inspections must be in place to ensure that ships comply with their obligations to discharge ship-generated wastes and cargo residues. Considering that ships run on tight schedules, not all ships can be subject to port inspections without making the system extremely burdensome and ineffective. Additionally, authorities conducting such inspections face several constraints, e.g., budget and time. Thus, port inspections should target vessels that pose a risk of non-compliance.

Article 11(2) contains two parameters to select ships for inspections. First, inspections will take place if shipmasters do not provide the information required in the waste notification form set out in Annex II of Directive 2000/59/EC. Second, inspections will also take place in cases where the information provided reveals “other grounds to believe” that ships are not complying with their discharge obligations. Directive 2000/59/EC does not oblige Member States to conduct port inspections that are exclusively related to the compliance of discharge obligations. Therefore, inspections could be conducted, for instance, within the framework of Directive 2009/16/EC on Port State Control. This Directive targets substandard vessels and aims at increasing the compliance of international and EU legislation in the fields of maritime security and safety, marine environmental protection, and labor standards.

Regarding the compliance of discharge obligations at port reception facilities, the implementation of the provision related to port inspections has been diverse around ports in the EU. Some Member States conduct the inspections within the framework of Directive 2009/16/EC or within other specialized environmental inspections. [21] Some have also developed dedicated port inspections. [21] No matter the legal framework used to conduct port inspection, the application of the selection criteria, i.e., “waste notification form,” has proven to be challenging for several reasons. It is important to be aware that port authorities are not always in charge of conducting port inspections and that other specialized agencies could be responsible for conducting such inspections [19]. In general, the waste notification form does not serve as a basis on which to select ships for inspections because of the difficulties in collecting and actually monitoring such information; moreover, sometimes this information is not transmitted to the authorities in charge of the inspections [19, 21]. When authorities conduct inspections within the framework of Directive 2009/16/EC, other generic or historical criteria are used to select the ships and in several cases the compliance of the discharge obligations set out in Directive 2000/59/EC are not included in the inspection.

To enable authorities to use the selection criteria established in Directive 2000/59/EC, EMSA is developing a module for inspections of port reception facilities within THETIS, i.e., an information system for Port State Control, hosted by EMSA. The module will include information provided by shipmasters on ship-generated wastes and cargo residues [22]. In accordance with Article 12(3) of Directive 2000/59/EC, this database should enable the identification of ships that are not delivering their wastes as provided in the Directive. As such, it is an important tool to facilitate port state control and monitoring activities. This database could also be useful in analyzing, for instance, the quantities and nature of cargo residues received at port reception facilities, and eventually this database could be a starting point to ensure the traceability of these hazardous wastes on land.

Difficulties in assessing the information contained in the waste notification form have a negative impact on the selection of ships for inspection. Concerning ship-generated wastes, ships may be exempted from their discharge obligations if they have “sufficient dedicated storage capacity.” The interpretation of this exemption varies around

ports. For this reason, EMSA adopted guidelines on ship inspection that include several methods for the calculation of the dedicated storage capacity [37]. Regarding cargo residues, the selection of ships for inspection is also problematic because Directive 2000/59/EC does not impose any mandatory discharge criteria other than the standards set out in MARPOL. Shipmasters, subject to some exceptions, are able to freely choose the reception facility for the discharge of these wastes. Authorities, even if they have access to the waste notification form, may not be able to assess the location of the reception facility where cargo residues must be discharged. They could also face difficulties in assessing whether a ship has enough storage capacity because the information provided in the waste notification form usually contains “estimations as the amounts will depend on the methods used to unload the cargo, which vary from port to port.” [37]

6. Concluding remarks: the Future of the Directive on Port Reception Facilities

Directive 2000/59/EC is currently under revision and the Commission submitted a legislative proposal in January 2018 to repeal the current Directive.[38] Such revision is necessary to enhance the integration of ship-generated wastes and cargo residues into wider EU waste legislation. Several aspects should be considered when addressing the management of ship wastes on land and the challenges that port users and port authorities face. First, there is a need for harmonization of terminology between MARPOL and EU legislation. The proposal takes a positive step in this direction by including a general definition of ‘waste from ships’ that includes cargo residues as well as residues subject to MARPOL, Annex VI. This potential amendment is also the result of regulatory developments at the international level. Regulation 17 of MARPOL, Annex VI, requires that State Parties provide reception facilities for “exhaust gas cleaning residues and exhaust gas cleaning systems.”^m

Second, mandatory discharge criteria for all categories of ship wastes should be included. Compulsory discharge criteria include the correlated obligation of States to manage such waste on land in an environmentally sound manner without transforming one source of pollution into another. This could prove particularly challenging for cargo residues due to the diversity of these residues as well as for the practices around ports that leave the management of such residues to individual terminals. The discharge criteria set up in article 7 of the legislative proposal is far from satisfactory. The general rule indicates that before leaving the port, the master of a ship delivers the wastes in accordance to MARPOL. As discussed in this paper, MARPOL does not impose compulsory standards that specify the location where ship wastes must be discharged, *e.g.*, the unloading port. Therefore, ships with enough holding capacity can freely choose, subject to some exceptions, the port reception facility for the discharge of wastes. However, the general rule set forth in the legislative proposal is subject to several caveats. Article 7(7) prescribes that when the next port of call is outside the EU or adequate facilities are not available in the next port of call, wastes must be delivered before departure. This seems to indicate that ship wastes must be delivered at least in an EU port.

The proposal in its article 7(5) prescribes that ships may be exempted from their discharge obligations if they have “sufficient dedicated storage capacity.” From the wording of the article, it seems that such exception will apply if the next port of call is located within the EU. Currently, the challenges faced to implement such exception is the diverse interpretation around ports of the meaning and extent of ‘sufficient storage capacity.’ The legislative proposal confers implementation powers to the Commission to establish the methods to be used for the calculation of the storage capacity.

Third, in order to improve the traceability of these wastes on land it is necessary to include obligations regarding cooperation and exchange of information between dedicated terminals, waste operators, and port authorities. It is positive that the legislative proposal includes reporting and exchange of information based on the Union Maritime Information and Exchange System (SafeSeaNet). This information will be transmitted to the IMO electronic database GISIS. This IMO database aims at increasing the reporting rate among State Parties and enabling “coordination with relevant intergovernmental organizations ... research on trends [and] statistical analysis.”[39] In the pursuit of

^m In ports where ships undergo repairs or where ships are dismantled, facilities should be available for the reception of “ozone-depleting substances and equipment containing such substances when removing from the ship.” Since repairs and ship breaking are not within the day-to-day operations of ships, this requirement will probably be left outside the scope of the Directive.

transparency, States are encouraged to use GISIS as an effective way to comply with their reporting obligations under MARPOL.[40]

Finally, transparency and waste management fees should also be addressed, especially in relation to cargo residues. Article 8 of the legislative proposal details that waste from ships other than cargo residues shall be covered by an indirect fee and if necessary by a direct fee. The positive development of the proposal is the establishment of the basis for the calculation of waste fees. However, cargo residues continue to be excluded from the fee system. This implies that direct contractual arrangements between the ship operator and the terminal will continue to take place. Such scheme certainly hinders the monitoring of obligations, e.g., discharge criteria.

The legislative proposal fails to reflect how the waste management hierarchy is going to be incorporated into waste reception and handling plans; b) the support of waste-minimization practices on board ships; and c) the provision of waste segregation and separate collection obligations. The inclusion of waste from ships within the meaning of the Waste Framework Directive 2008/98/EC has proven to be insufficient as previously discussed in this paper. In general, the integration of ship wastes with wider EU waste legislation will continue to be the major challenge. This uncertainty is a common problem of what Ringbom calls “horizontal environmental requirements,”[14] *i.e.*, “EU legislation of activities that could occur on board ships or that regulates substances that could be transported or generated by ships.” [14] In the absence of an express provision regarding the relation of a piece of environmental legislation to ships, their applicability remains limited because the rationale behind the adoption of these “horizontal measures” may not always consider the particular features of maritime transport. [14] The revision of Directive 2000/59/EC on Port Reception Facilities should be an opportunity to clarify how and to what extent the obligations of the Waste Framework Directive 2008/98/EC are applicable to these wastes in detail. The Current reference at the EU level to horizontal measures is far from satisfactory since such measures are unrelated to daily shipping operations. The result is the inapplicability of such standards to ships.

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