Financial instrument to facilitate safe and sound ship recycling

Final Report

June – 2016

ECORYS

DNV·GL

ERASMUS SCHOOL OF LAW
ERASMUS UNIVERSITEIT ROTTERDAM

EUROPEAN COMMISSION

Directorate-General for Environment
Directorate A — Green Economy
Unit A.2 — Waste management and recycling

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European Commission
B-1049 Brussels

EUROPEAN COMMISSION

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Directorate-General for Environment
Financial Incentive for Ship Recycling

2014

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Starting with its founder, Professor Piet Sanders, one of the drafters of the 1958 New York Convention on the recognition and enforcement of foreign arbitral awards, successive professors, their staff and PhD’s at ESL have contributed substantively and consistently to the development of commercial law in general, and maritime and insurance law in particular.

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PREFACE

This study was executed by a team of Ecorys, Erasmus School of Law, and DNVGL. The work undertaken has benefited much from the active engagement of a variety of stakeholders, both Member States, NGOs and industry representatives, who provided useful information, data and opinions on the matter at hand.

We would like to thank the members of the Steering Committee, in particular DG Environment and DG MOVE for their support and guidance, and their feedback on draft versions of this report.

Disclaimer

Rotterdam/Brussels/Hamburg, June 2016

ABSTRACT

Regulation (EU) No 1257/2013, also referred to as the Ship Recycling Regulation (SRR), entered into force on 30 December 2013. To address concerns over its efficacy, as the Regulation only requires sound recycling for EU flagged ships, a criterion that can easily be circumvented through timely re-flagging to a non-EU flag, the possibility for the European Commission to create a financial incentive is provided in Article 29 of the SRR, stating that the Commission shall report before the end of 2016 on "*the feasibility of a financial instrument that would facilitate safe and sound ship recycling*".

To be effective, a proposed financial instrument must be capable of inducing a change in behaviour on the part of ship owners towards the recycling of their ships in compliance with the SRR.

Various options have been considered for such a financial instrument in previous studies, but an earlier proposal based on these to the European Parliament was rejected.

This study proposes an alternative financial incentive instrument based on the introduction of a Ship Recycling Licence required for the entry to EU ports, connected with fees that serve capital accumulation with the aim to cover the revenue gap between sound and unsound recycling.

EXECUTIVE SUMMARY

The information and views set out in this study are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission's behalf may be held.

Regulation (EU) No 1257/2013, also referred to as the Ship Recycling Regulation (SRR), entered into force on 30 December 2013. However, there are concerns over its efficacy as the Regulation only requires sound recycling for EU flagged ships, a criterion that can easily be circumvented through timely re-flagging to a non-EU flag. To avoid this, a financial instrument could incentivise ship owners to recycle their ships in a safe and sound manner. The possibility for the European Commission to create a financial incentive is provided in Article 29 of the SRR, stating that the Commission shall report before the end of 2016 on "*the feasibility of a financial instrument that would facilitate safe and sound ship recycling*".

To be effective, a proposed financial instrument must be capable of inducing a change in behaviour on the part of ship owners towards the recycling of their ships in compliance with the SRR. More specifically, the current premium (in terms of higher revenue for the ship offered for scrapping) for ship owners who opt to recycle their ships at unsafe and unsound facilities – rather than at SRR-compliant facilities – must be neutralised or even reversed.

Various options have been considered for such a financial instrument in previous studies (Ecorys 2005, COWI/Milieu 2009, Profundo 2013, Milieu 2013). These options can be categorised into two groups:

- Obliging ship owners to collect the required capital through a privately managed mechanism that is attached to a unique ship. This concerns the instruments of a Ship Recycling Guarantee (SRG), the Ship Recycling Escrow-account (SRE) and the Ship Recycling Insurance (SRI);
- Obliging ship owners to contribute to a public regime (a fund) based on payments to be made when accessing EU ports (the port levy/Ship Recycling Fund option).

There are differences between the various options for a financial instrument within these main categories (either public or private). However, some of the most fundamental design elements (e.g. the amount of capital to be collected, duration, procedures for releasing money) apply to all options and influence the eventual, overall design of the options. In addition, specific design aspects exist for each individual financial instrument.

As part of this study, a review of five different instruments was made, which were partly already investigated in previous studies. Key drawbacks of each of these instruments are summarized in the table below:

Option	Main shortcoming
Non-financial measures	Easy to circumvent or stimulating additional circumvention behaviour, and/or lack of suitable enforcement mechanism.
Ship Recycling Guarantee	Difficult to transfer in case of change of ownership; disproportionate to ships with low frequency of calls

Option	Main shortcoming
	at EU ports.
Ship Recycling Account	Difficult to transfer in case of change of ownership; disproportionate to ships with low frequency of calls at EU ports.
Ship Recycling Insurance	Lack of "insured object" due to lack of unforeseen event, other than loss of the vessel due to an accident. Not feasible as separate instrument.
Port levy	High administrative burden for ports; potentially not WTO compliant; possibly considered as tax (outside the mandate of the EC).

As presented in the above table, non-financial instruments are not found to be very effective. Although options 2 and 3 would be possible for ships that are not expected to change ownership over (most of) their lifetime, it is less suitable as an instrument that would apply to all ships. Option 4 is not feasible as a separate instrument. Finally, there are serious questions regarding the legal feasibility of a port levy (option 5). In addition, the levy would be hard to establish and it would cause relatively high administrative burdens. That option was in fact rejected when first proposed to the European Parliament in 2013.

A Ship Recycling Licence

As an alternative to the port levy, we have identified a new financial instrument – the purchase of a Ship Recycling Licence (SRL) as a mechanism to collect capital at port calls – which overcomes the main weaknesses of option 5. The principles of this SRL take note of the advantages of some of the previous options, as follows:

- By **obliging all ships that call at EU ports to obtain a prior licence** from a centralised European agency, an instrument of a public, administrative law nature is created. This licence requirement can be used to impose a financial instrument upon ship owners, which provides a financial incentive to opt for safe and sound ship recycling as well as a penalty (i.e. forfeiture of accrued rights) in case of failure to comply. Since the purpose for the creation of the licence is to achieve the public policy objectives of the Ship Recycling Regulation, this licence is referred to as the Ship Recycling Licence or SRL;
- The basic idea behind the SRL is that a contribution is charged to the ship owner, when he applies for this licence. This contribution consists of two elements. The first part, a (small) charge to cover the administrative costs of issuing the SRL, is retribution. The second part, **a premium, is levied from the ship owner, and transferred to the ship-recycling fund**, where it is administered separately ("earmarked") in a transparent manner, together with the other capital already accumulated by the relevant ship as an individual credit to a future payment of the same amount;
- **The amount of the premium levied, depends on the capital amount that needs to be accumulated for the relevant ship and the set time-frame**, within which the capital is to be accumulated. The capital amount needed for a particular ship in turn depends on factors connected to the individual characteristics of the relevant ship (e.g. its size and ship type). To be effective in terms of recycling behaviour, the said capital amount would need to bridge the revenue gap

between the revenues for a ship owner opting for ship recycling in compliance with the SRR and the situation in which the ship owner opts for the (currently) more lucrative option of non-SRR-compliant ship recycling;

- The full capital amount does not become payable until after the ship has been recycled. **It is payable to the ultimate ship owner and is subject to the fulfilment of a condition precedent**. Only if the ultimate ship owner proves that the ship has been recycled in compliance with the SRR at a ship recycling facility included in the European List, will the capital amount earmarked for the ship be paid out. If, however, it becomes apparent that the ship has been dismantled in a facility not included in the European List, the ship owner forfeits the accrued rights to the payment of the capital amount. Once the forfeiture procedure to be prescribed has been concluded, the capital amount will be transmitted by the Ship Recycling Fund to a general benefit fund in the area of ship recycling. The said procedure will need to be an administrative law procedure at the European level, which allows for the possibility of judicial review;
- In order to avoid that the SRL and the premium thus levied from ships calling at EU ports work out disproportionally for ships with either a very high frequency (e.g. tugboats and coastal vessels) or a very low frequency of calling at EU ports, **the SRL validity would be time-based rather than linked to the number of calls**. The duration of the SRL's validity could be differentiated, e.g. offering ship owners the choice to apply for an SRL with a validity of a month instead of a year, and to adjust the premium accordingly, in the interest of ships with very low frequencies of call in EU ports.

Envisaged impacts of the financial instrument

In the baseline situation, with the SRR in place, the amount of ships offered for sound recycling is still very small. The financial instrument proposed will generate more substantial impacts, not immediately but over a time period of about 20 years, which is needed to allow capital accumulation. By then, on the basis of calculations made with the financial model developed for this study, about half of the world fleet currently calling at European ports will be incentivised to opt for sound recycling, increasing to about 65% for the newest ships sailing today. This will cause social and environmental benefits notably in South Asia as a result of more strict recycling principles being applied.

Adverse economic impacts that the financial instrument inevitably generates include an increase of ship´s operating costs (in the order of 1%), costs of EU port calls (in the order of 2%) and small impacts on trade to/from the EU as a consequence of these cost increases. Furthermore there may be impacts on the shipbuilding market and the second hand sales market of ships. Administrative costs of the mechanism amount to about 0,8% of the licence fees. The financial instrument may have further positive impacts on EU flag registration and fiscal revenue thereof.

Considerations for its implementation

If the European Commission decides to follow the recommendation of this study to introduce a financial incentive in the form of a Ship Recycling Licence as a requirement to be imposed upon all ships calling at EU ports, the roadmap for its implementation envisages the instrument to be introduced through a self-standing regulation or as a regulation that aims to modify the existing SRR. In the short run, a self-standing regulation seems preferable. In the longer run when the SRR is due for its periodical legislative evaluation, it may be considered to incorporate the two regulations into a single regulation to replace the SRR.

Important elements of future implementation include:

- The establishment of a new European Ship Recycling Agency to be set up or alternatively to assign its tasks to an already existing European Agency, to be charged with the task of implementing the new regulatory requirement;
- Further exploration on the possible uses of forfeited funds, in the interest of the objectives of the SRR;
- The elaboration of a certification and notification scheme for sound recycling, in the interest of non-EU flagged ships and monitored by the Ship Recycling Agency (parallel to the one which currently applies to EU flagged ships under the Ship Recycling Regulation, applicable to non-EU flag states[1]);
- Integration of the Ship Recycling Licence requirement into Port State Control as exercised by EU Member States under the Paris Memorandum of Understanding (MOU), the Port State Control Directive 2009/16/EC and into the Thetis information system as developed by EMSA;
- The setting up of a monitoring and evaluation regime, in particular to regularly verify and update the understanding of the revenue gap to be covered by the mechanism, and adjust associated fee levels accordingly. A frequency of revision of once in five years is suggested.

With regard to the implementation timeline, it seems advisable to adopt a timeline starting not earlier than that under article 32 (2) (b) SRR for the requirement of an Inventory of Hazardous Materials (IHM) that applies also to non-EU flagged ships, i.e. 31 December 2020. This would allow time for the legislative process at EU level to be completed, for the setting up of a Ship Recycling Agency or the tasking of an existing agency with the implementation of the Ship Recycling Licence and finally for the shipping industry to adapt to this new regulatory requirement.

The possibility of private mechanisms to take the place of the proposed public regime under the proposed instrument is at this stage considered unnecessary for its effective implementation, but could be left open for later consideration. Also the extension of the mechanism to ships smaller than 500 GT (currently excluded from the SRR) is possible and could be decided upon at a later stage.

1 See Articles 6 and 7 SRR.

FRENCH EXECUTIVE SUMMARY

Les informations et opinions exprimées dans cette étude sont celles des auteurs et ne reflètent pas nécessairement l'opinion de la Commission. La Commission ne garantit pas l'exactitude des données figurant dans cette étude. Ni la Commission, ni aucune personne agissant au nom de la Commission ne peut être tenue responsable de l'utilisation qui pourrait être faite des informations contenues dans le présent document.

Le Règlement (EU) No 1257/2013, ou règlement relatif au recyclage des navires (SRR), est entré en vigueur le 30 décembre 2013. Cependant, des inquiétudes se sont fait jour quant à son efficacité, car le règlement ne requiert un recyclage sécurisé et respectueux de l'environnement que pour les navires battant pavillon européen, un critère facilement contourné en changeant le pavillon du navire avant son démantèlement. Afin d'éviter cela, un instrument financier pourrait inciter les propriétaires de navires à recycler ces derniers de façon sécurisée et respectueuse de l'environnement. La possibilité pour la Commission Européenne de créer une incitation financière est fournie dans l'article 29 du SRR, qui mentionne que la Commission devra soumettre, avant fin 2016, un rapport sur « *la faisabilité d'un instrument financier qui faciliterait le recyclage sûr et écologiquement rationnel des navires.* »

Pour être efficace, l'instrument financier proposé doit être en mesure d'inciter un changement de comportement des propriétaires de navires afin qu'ils effectuent le recyclage de leurs navires en conformité avec le SRR. Plus spécifiquement, la prime actuelle (en termes de revenus plus élevés pour le bateau proposé à la démolition) pour les propriétaires de navires choisissant de recycler leurs bateaux dans des installations ni sécurisées, ni respectueuses de l'environnement - plutôt que dans des installations conformes aux exigences du SRR - doit être neutralisée, voire inversée.

Différentes options pour un tel instrument financier ont été explorées au cours d'études précédentes (Ecorys 2005, Ecorys COWI/Milieu 2009, Profundo 2013, Milieu 2013). Ces options peuvent être catégorisées en deux groupes:

- Obliger les propriétaires de navires à collecter le capital requis par le biais d'un mécanisme de gestion privée, attaché à un navire unique. Ceci concerne les instruments d'une garantie de recyclage des navires (Ship Recycling Guarantee ou SRG), le compte en séquestre du recyclage du navire (Ship Recycling Escrow-account ou SRE) et l'assurance de recyclage du navire (Ship Recycling Insurance ou SRI);
- Obliger les propriétaires de navires à contribuer à un régime public (un fonds) basé sur des paiements à effectuer lors de l'accès aux ports européens (l'option taxe portuaire/fonds de recyclage des navires).

A l'intérieur de ces grandes catégories, il existe des nuances majeures entre les différentes options pour un instrument financier (qu'elles soient publiques ou privées). Cependant, certains des éléments principaux de conception (p. ex. le montant du capital à collecter, la durée, les procédures de libération des fonds) s'appliquent à toutes les options et influencent la conception globale et finale de ces options. De plus, des nuances de conception spécifiques existent pour chaque instrument financier individuel.

Dans le cadre de cette étude, il a été procédé à un nouvel examen de cinq instruments différents déjà partiellement analysés au cours d'études précédentes. Les inconvénients principaux de ces instruments sont résumés dans le tableau ci-dessous:

Option	Inconvénient principal
Mesures non financières	Faciles à contourner, ou stimulent un comportement de contournement supplémentaire, et/ou manque de mesures d'exécution adaptée.
Garantie de recyclage de navire	Difficile à transférer en cas de changement de propriétaire ; disproportionné pour les navires ayant une fréquence d'escale dans des ports de l'UE basse.
Compte de recyclage de navire	Difficile à transférer en cas de changement de propriétaire ; disproportionné pour les navires ayant une fréquence d'escale dans des ports de l'UE basse.
Assurance de recyclage de navire	Manque « d'objet assuré » en raison d'un manque d'évènement imprévisible, autre que la perte du navire en raison d'un accident. Pas réalisable en tant qu'instrument séparé.
Taxe portuaire	Charge administrative lourde pour les ports, potentiellement non conforme aux règles de l'OMC, potentiellement considéré comme un impôt (en dehors des compétences de l'Union Européenne).

Comme illustré dans le tableau ci-dessus, les instruments non financiers ne font pas preuve d'une grande efficacité. Bien que les options 2 et 3 soient réalisables pour les navires dont on ne s'attend pas à ce qu'ils changent de propriétaire pour l'essentiel de leur durée de vie, elles sont moins adaptées comme instruments à appliquer à tous les navires. L'option 4 n'est pas réalisable en tant qu'instrument séparé. Enfin, il existe de sérieuses questions quant à la faisabilité légale d'une taxe portuaire (option 5). De plus, la taxe serait difficile à établir et causerait une charge administrative relativement élevée. Cette option a de fait été rejetée lorsqu'elle fut initialement proposée au Parlement Européen en 2013.

Une licence de recyclage des navires

En guise d'alternative à la taxe portuaire, nous avons identifié un nouvel instrument financier qui réponde aux faiblesses principales de l'option 5: l'achat d'une licence de recyclage de navires (Ship Recycling Licence ou SRL) comme outil de collecte de capital lors des escales en ports -. Les principes de cette SRL prennent en compte les avantages de certaines des options précédentes comme suit:

- En **obligeant tous les navires faisant escale dans les ports de l'UE à obtenir une licence préalable** auprès d'une agence européenne centralisée, un instrument juridique public et administratif est créé. Cette exigence de licence peut être utilisée pour imposer un instrument financier aux propriétaires de navires, ce qui fait office d'incitation financière à opter pour un recyclage sécurisé et respectueux de l'environnement et s'accompagne de pénalités (c.-à-d. l'annulation des droits acquis) en cas de non-conformité. Étant donné que le but de la licence est de parvenir aux objectifs publics du règlement relatif au recyclage des navires, cette licence est désignée comme Licence de recyclage des navires, Ship Recycling Licence ou SRL;

- L'idée de base derrière la SRL est qu'une contribution soit facturée au propriétaire du navire lorsqu'il effectue la demande de licence. Cette contribution est constituée de deux éléments. La première partie est un (petit) coût couvrant les frais administratifs de délivrance de la SRL; il s'agit d'une rétribution. La seconde partie, **une prime, est prélevée auprès du propriétaire du navire et transférée au fonds de recyclage des navires,** où elle est traitée séparément (« réservée ») avec transparence, avec le capital déjà accumulé par le navire en question en tant que crédit individuel sur un futur paiement de la même valeur;
- **La valeur de la prime prélevée dépend du montant du capital devant être accumulé pour le navire et de la période** sur laquelle le capital doit être accumulé. Le capital nécessaire pour un navire particulier dépend de facteurs liés à ses caractéristiques individuelles (p. ex. taille et type). Afin d'avoir un impact sur le comportement de recyclage, ce capital doit couvrir l'écart des revenus entre un recyclage conforme avec le SRR et l'option actuellement plus lucrative d'un recyclage non conforme;
- La valeur totale du capital n'est payable qu'après le recyclage du navire. **Elle est payable au dernier propriétaire du navire, et sujette à la réalisation d'une condition préalable.** C'est uniquement dans le cas où le dernier propriétaire du navire prouve que le navire a été recyclé en conformité avec le SRR dans une installation inscrite sur la liste européenne que le capital réservé pour le bateau sera payé. Cependant, s'il apparait que le navire a été recyclé dans une installation ne figurant pas sur la liste européenne, le propriétaire du navire s'acquitte des droits accumulés pour le paiement de la valeur du capital. Une fois la procédure de confiscation à prescrire réalisée, la valeur du capital sera transmise par le fonds de recyclage des navires à un fonds de bénéfice général dans le domaine du recyclage de navires. Ladite procédure doit être une procédure juridique administrative au niveau européen, qui ouvre la possibilité d'une révision juridique;
- Afin d'éviter que la SRL et la prime prélevée pour les bateaux faisant escale dans des ports de l'UE soient disproportionnées pour les navires ayant soit une fréquence très élevée (p. ex. les remorqueurs et navires côtiers) ou une fréquence très faible d'escale dans des ports européens, **la validité de la SRL serait basée sur la durée plutôt que sur le nombre d'escales.** La durée de la validité de la SRL peut être différentielle, en offrant p. ex. aux propriétaires de navires le choix de demander une SRL à validité d'un mois plutôt que d'un an, et d'ajuster la prime en fonction, dans l'intérêt des navires aux fréquences d'escales très faibles dans des ports de l'UE.

Conséquences envisagées sur l'instrument financier

Dans la situation de départ, une fois le SRR mis en place, le nombre de navires candidats à un recyclage sécurisé et respectueux de l'environnement est toujours très faible. L'instrument financier proposé aura des conséquences plus substantielles, non pas immédiatement mais sur une période de temps d'environ 20 ans, nécessaire pour permettre l'accumulation du capital. D'ici là, selon les calculs effectués avec le modèle financier réalisé pour cette étude, environ la moitié de la flotte mondiale faisant actuellement escale dans des ports européens fera l'objet d'une incitation au recyclage conforme, une augmentation d'environ 65 % pour les navires les plus récents naviguant aujourd'hui. Ceci impliquera des bénéfices sociaux et environnementaux, notamment en Asie du Sud, en conséquence de l'application de principes de recyclage plus stricts.

Parmi les impacts économiques négatifs inévitablement générés par l'instrument financier figurent: une augmentation des coûts opérationnels des navires (de l'ordre de 1 %), des coûts des escales dans les ports européens (de l'ordre de 2 %) et de petits impacts sur le commerce depuis/vers l'UE en conséquence de ces augmentations. Des impacts sur le marché des chantiers navals et sur le marché des ventes de navires d'occasion pourraient également être observés. Les coûts

d'administration du mécanisme s'élèvent à environ 0,8 % des frais de la licence. L'instrument financier peut avoir des impacts supplémentaires sur l'enregistrement des bateaux sous les pavillons européens et sur les revenus fiscaux qui y sont liés.

Considérations pour sa mise en œuvre

Si la Commission Européenne décide de suivre la recommandation de cette étude et de mettre en place une incitation financière sous forme de licence de recyclage de navires comme exigence à imposer à tous les navires faisant escale dans les ports de l'UE, la chronologie de mise en œuvre envisage son implémentation par le biais d'un règlement autonome ou en tant que règlement modifiant le SRR existant. À court terme, un règlement autonome semble préférable. À plus long terme, lorsque le SRR sera soumis à son évaluation juridique périodique, on peut considérer fusionner les deux règlements en un seul règlement.

Parmi les éléments importants de la future mise en œuvre, on retrouve:

- L'établissement d'une nouvelle agence européenne de recyclage de navires, ou bien l'assignation de ces tâches à une agence européenne préexistante, à qui l'on confierait la mise en place d'une nouvelle exigence règlementaire;
- Une exploration plus en profondeur des utilisations possibles des fonds levés, dans l'intérêt des objectifs du SRR ;
- L'élaboration d'un dispositif de certification et de notification de recyclage conforme, dans l'intérêt des navires ne battant pas pavillon européen et surveillé par l'agence de recyclage des navires (parallèle à celui qui s'applique actuellement aux navires battant pavillon européen soumis au règlement de recyclage des navires, applicable aux états ne battant pas pavillon européen[2]);
- L'intégration de l'exigence de licence de recyclage des navires dans le contrôle par l'état du port tel qu'effectué par les états membres de l'UE sous le mémorandum d'entente de Paris (MOU), la directive de contrôle par l'état du port 2009/16/EC et dans le système d'information Thetis tel que développé par EMSA;
- La mise en place d'un régime de surveillance et d'évaluation, en particulier pour vérifier et mettre à jour de façon régulière la compréhension de l'écart de revenus à couvrir par le mécanisme, et pour ajuster en conséquence les niveaux de frais. Une fréquence de révision d'une fois tous les cinq ans est suggérée.

En ce qui concerne la chronologie de mise en œuvre, il est recommandé de ne mettre en place l'instrument qu'à partir de la date fixée dans par l'article 32 (2) (b) du SRR pour l'exigence d'un Inventaire de matériaux dangereux (Inventory of Hazardous Materials ou IHM) qui s'applique également aux navires ne battant pas pavillon européen, c.-à-d. le 31 décembre 2020. Ceci donnerait le temps de compléter le processus législatif au niveau de l'UE, de mettre en place une agence de recyclage des navires ou de charger une agence existante de la mise en œuvre de la licence de recyclage des navires, et finalement de laisser le temps à l'industrie de s'adapter à cette nouvelle exigence réglementaire.

On considère que la possibilité de mécanismes privés prenant la place du régime public proposé sous l'instrument proposé n'est, à ce stade, pas nécessaire pour sa mise en place efficace, mais elle peut être laissée ouverte à la considération ultérieure. Aussi, l'extension de ce mécanisme aux navires de moins de 500 GT (actuellement exclus du SRR) est possible et peut être décidée à un stade ultérieur.

2 Voir les articles 6 et 7 de la SRR.

LIST OF ABBREVIATIONS

AIS	automatic Identification System
Art.	Article
CAPEX	Capital Expenditures
DWT	Dead Weight Tonnage
ECJ	European Court of Justice
EEA	European Economic Area
ESM	Environmentally Sound Management
ETS	Emission Trading System
FTE	Fulltime Equivalent
HKC	Hong Kong Convention
GT	Gross Tonne
IA	Impact Assessment
IHM	Inventory of Hazardous Materials
ILO	International Labour Organisation
IMO	International Maritime Organisation
LDT	Light Displacement Tonnage
MEPC	Marine Environmental Protection Committee
MoU	Memorandum of Understanding
MS	Member State
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Co-operation and Development
OPEX	Operational Expenditures
PCB	Polychlorinated Bifenyls
PSCO	Port State Control Officers
ROC	Return on Capital
ROW	Rest of World
SCM	Standard Cost Model
SRA	Ship Recycling Agency

SRE	Ship Recycling Escrow-account
SRG	Ship Recycling Guarantee
SRI	Ship Recycling Insurance
SRL	Ship Recycling Licence
SRR	Ship Recycling Regulation
TEU	Twenty feet Equivalent Unit
TFEU	Treaty on the Functioning of the European Union
ToR	Terms of Reference
TRL	Turkish Lira
USD	United States Dollar
UNCLOS	United National Convention on Law of the Seas
WRS	Waste Shipment Regulation
WTO	World Trade Organisation

1. INTRODUCTION AND BACKGROUND

1.1. Background

Ship recycling – if not carried out in a safe and sound manner – presents clear risks both for human health and for the environment. Many vessels contain hazardous materials like asbestos, PCBs and heavy metals and the conditions for recycling or disposing of them are often poor or absent, particularly in major ship recycling nations such as India, Bangladesh and Pakistan. The vessels are mostly run on tidal beaches which are unable to support heavy lifting equipment. Many of the dismantling activities are carried out manually and, due to the lack of safety measures, fires and explosions occur regularly.

Against this background, the International Maritime Organisation (IMO) adopted the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships (the HKC) in May 2009. As this is not expected to enter into force before 2020, the EU adopted the European Ship Recycling Regulation[3] (SRR), requiring ships under EU flags to be recycled in a sustainable manner at the end of their lifetime. Although the SRR entered into force at the end of 2013, it will start applying in gradual stages only from the date of publication of the European List of ship recycling facilities.[4]

However, despite the SRR, the possibility exists that EU ships will be re-flagged at the end of their economic life to avoid the requirements set forth by the SRR. Circumvention behaviour is already observed with regards to current applicable legislation, as can be observed from end-of-life flag change data reported by the NGO Shipbreaking Platform. To this purpose, a financial instrument could be created to provide an incentive that prevents the re-flagging of ships in avoidance of the SRR.

1.2. Ship recycling: state of play

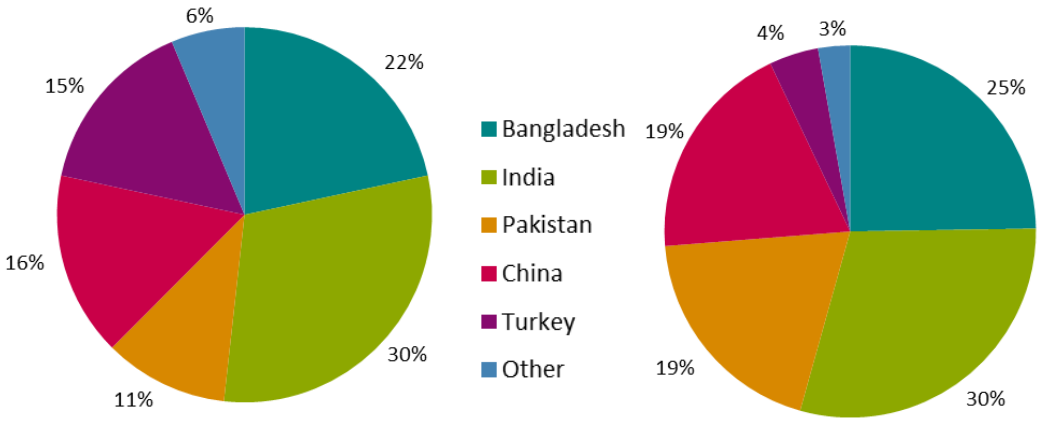
India, China, Bangladesh and Pakistan are currently the major ship recycling states in the world. Although the precise figures differ per source, it is estimated that they jointly recycle almost 80% of all vessels (2014 data). Of the 20% recycled in other countries, Turkey has the most important share of the market. In dead weight tonnage (DWT), the four Asian states have an even more prominent role as they recycled 93% of all tonnage demolished in 2014, showing that larger ships are mostly demolished in these countries, whereas mainly smaller vessels are recycled at Turkish and other OECD yards. These latter yards recycle mainly pilotage ships, offshore supply vessels, fishing vessels and smaller coastal vessels[5], while the Asian yards recycle larger vessels, e.g. bulk cargo carriers, container vessels and tankers.

3 *Regulation 1257/2013.*

4 *See Article 32 SRR which differentiates between subjects to which SRR becomes applicable as from 31 December 2014 (Art. 32 (2) (a) SRR), its general application not earlier than from 31 December 2015 and not later than on 31 December 2018 (Art. 32 (1) SRR); and its limited application to non-EU flagged vessels (Art. 32 (2) (b) SRR).*

5 *European Commission, DG Environment (2013) 'Report on the public consultation on new initiative regarding dismantling of ships.'*

Figure 1.1 Major ship recycling states by number of vessels (left) and DWT (right) in 2014



Source: NGO Shipbreaking Platform (2015), Annual report 2014.

EU flagged ships

The recycling-related provisions of the SRR apply to EU flagged ships only. The share of EU flagged ships in the total world fleet is close to 20%. If end-of-life ships only are considered, this percentage is much lower, at 9% (even without the SRR being effective). Analysis of fleet and flag data (see section 3.2) shows that typically, ships change owner and flag over their lifetime with older ships carrying less than average an EU flag. In terms of EU beneficial ownership[6], the share in the world fleet is 40% of the overall fleet and 24% of end-of-life vessels, respectively[7].

26% of EU flagged ships are dismantled in European yards at present and 39% are dismantled in South Asian yards (2014 data).

Table 1.2 Scrapping of EU Beneficial Owner and EU flagged ships (number of ships sold, 2014)

Dismantled in	EU Beneficial Owner	EU Flag
South Asia	182 (65%)	41 (39%)
China & Turkey	61 (22%)	37 (35%)
EU	39 (14%)	28 (26%)
Total	282	106

Source: NGO shipbreaking platform, What a difference a flag makes, 2015.

6 *IHS Fairplay defines beneficial ownership as follows: (…) the parent company of the Registered Owner, or the Disponent Owner if the ship is owned by a bank. It is the controlling interest behind its fleet and the ultimate beneficiary from the ownership. http://www.ihsfairplay.com/About/Definitions/definitions.html.*

7 *Data NGO shipbreaking platform.*

1.3. The economics of ship recycling

Ship recycling is a commercial business with scrap yards paying owners[8] significant amounts of money to salvage raw materials from the ship. These raw materials include: steel scraps, electric cables, pipes, engines, fuel, interior equipment, and so on. The table below, provided by cash-buyer Global Maritime Services, illustrates reported revenue sources and costs of ship recycling for a sample ship.

Figure 1.3 The economics of ship recycling for a sample ship: Panamax oil tanker of 14,800 LDT (80,000 DWT) – for illustrative purposes only

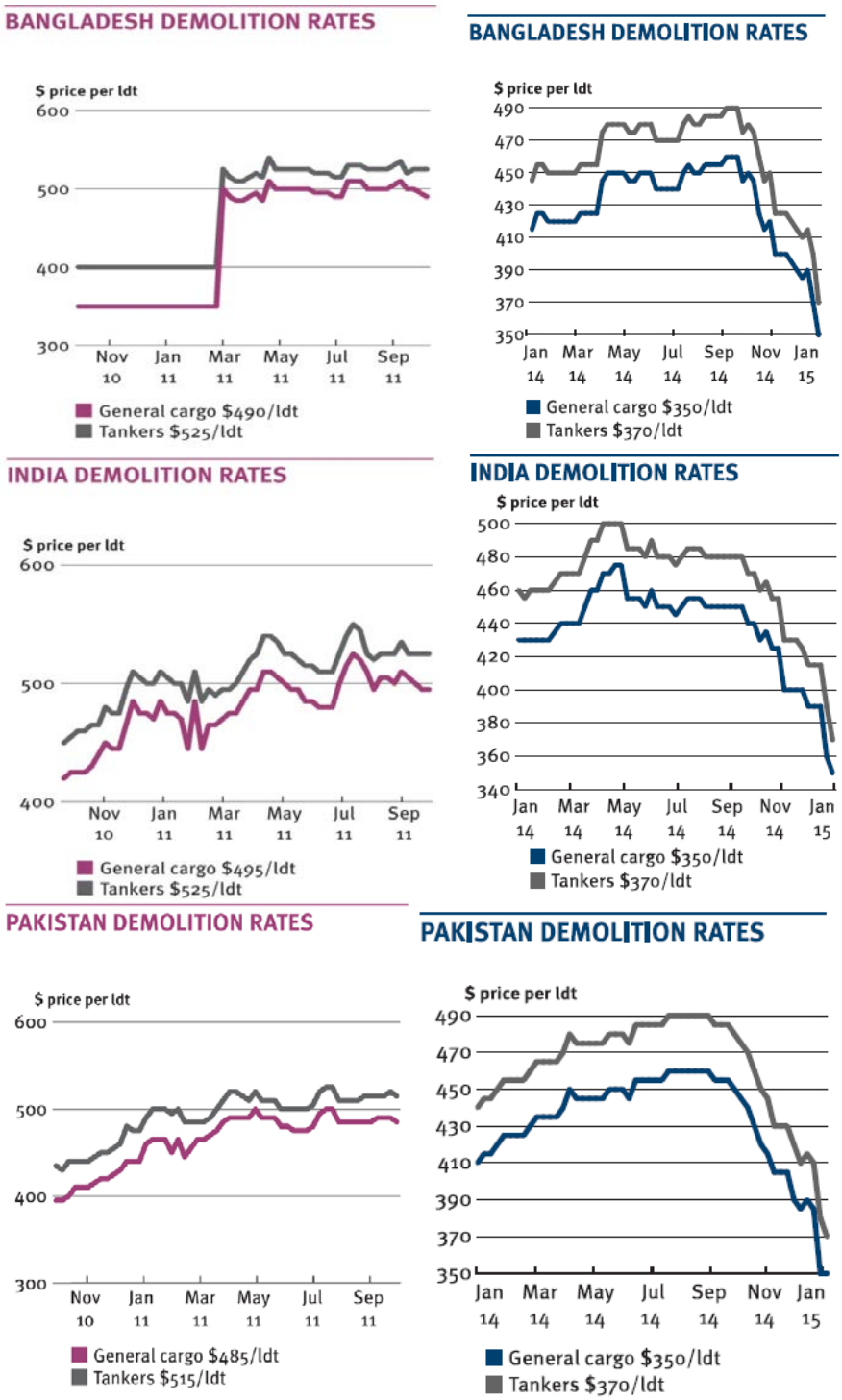
Category	Element	Bangladesh	Pakistan
Revenue	steel	$4,771,500	$4,992,800
	other recyclable items	$842,000	$512,700
	total revenue	$5,613,500	$5,505,500
Costs	purchase of ship	$3,848,000	$3,848,000
	investment costs	$21,900	$18,300
	financial costs	$147,900	$265,700
	labour costs	$92,700	$233,400
	consumables	$302,200	$230,000
	taxes, tariffs and duties	$263,000	$693,600
	rents, levy and permits	$2,700	$500
	other costs	$13,800	$51,300
	total costs	$4,692,200	$5,340,800
Profit	profit	$921,300	$164,700
	%	16%	3%
	$/LDT	62	11

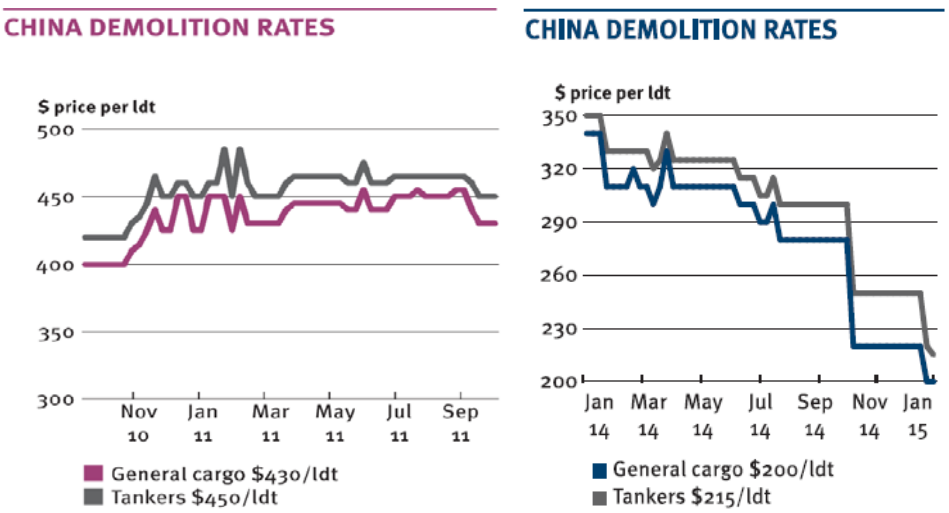
Source: GMSinc 2011.

8 Usually cash buyers, who under the Hong Kong Convention are considered as the final ship owners.

The price of a ship is very much dependent on the prices for the raw materials that can be salvaged, in particular steel. Since these fluctuate significantly over time and per region, the price of ships (demolition rates) also change. Data in the figure below compare 2011 and 2015 and show the high volatility of prices having been around $500/ldt in 2011 and down to approximately $350/ldt by early 2015 (prices have further plummeted since then, while variations between countries seem to have reduced).

Figure 1.4 Demolition rates ($ per LDT) in 2011 (left) and 2015 (right)





Source: Global Marketing Systems 2011 & 2015, in: Lloyds List. www.lloydslist.com.

The pressure to conduct ship recycling as cost effectively as possible has led to environmentally substandard ship dismantling.

1.4. The regulatory framework to improve the quality of ship recycling

To reduce the risk of substandard ship recycling, several international Conventions and EU regulations have been adopted. The most relevant texts are the Basel Convention (1989), The Hong Kong Convention (2009), Regulation (EC) No 1013/2006 on waste shipments and Regulation (EU) No 1257/2013 on ship recycling.

The Basel Convention and the Ban Amendment

The more general and most widely ratified Convention relevant to safe and sound recycling is the 'Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)'. The Basel Convention has been ratified by 183 states and political and/or economic integration organizations. The main aim of the Convention is to manage and dispose of hazardous waste in an environmentally sound manner. In order to minimise the detrimental effects of waste disposal, states are required to minimise the quantities moved across borders and all transboundary movements of waste without prior consent of the receiving state are illegal.

The Basel Convention applies to the transport of all hazardous waste and not just to ships in particular. However, active ship recycling facilities can only be found in a limited number of countries. Therefore, once a ship has been destined for scrapping by its owner, its last voyage to the recycling yard most often qualifies as a transboundary movement of waste.[9] In 1995, the Ban Amendment was concluded. This ban prohibits all transboundary movements of hazardous wastes from OECD to non-OECD states. This covers the recycling of ships sailing directly from Europe to yards in India, Bangladesh and Pakistan.

9 *Voorzitter Afdeling Rechtspraak Raad van State (President Judicial Division of Netherlands Council of State) 12 December 2001 Case No. 2001-12-12/SES_26121, LJN: AK4607, Schip&Schade 2002, 81 The Sandrien.*

The Ban Amendment applies within Europe as the amendment was transposed, together with the Basel Convention itself, into EU law by the Waste Shipment Regulation[10] (WSR, 2006). Under the WSR, all vessels in EU waters intended for recycling should be recycled at shipyards located within the OECD. Although the Ban Amendment applies within Europe, the amendment does not apply for other OECD states as the amendment has not been ratified by the minimum required number of states.

The Hong Kong Convention

As stated above, the Basel Convention is not specifically tailored towards ship recycling and scrapping. Since shipping is an international activity and most recycling is conducted at yards not located in the states of ownership, there was a need for an international treaty for ship recycling. At the initiative of IMO, the Hong Kong Convention (HKC) was adopted in 2009. The HKC aims to operate ship recycling facilities in a safe and environmentally sound manner. The following measures need to be taken to ensure an improved operation:

- Each ship sent for recycling needs to provide an Inventory of Hazardous Materials (IHM). The inventory will be compiled once the vessel is built, updated during the vessel's lifetime and a final survey is needed to complete the inventory before recycling;
- Ship recycling yards need to provide a ship recycling plan to indicate how the ship needs to be recycled. Parties under the Convention need to ensure that recycling yards comply with the Convention rules;
- All Parties to the Convention need to take effective measures in order to ensure compliance with the Convention.

The HKC suffers several shortcomings: it does not include the Polluter Pays Principle, and it is currently unclear when or whether the HKC will enter into force. As of 8 March 2016, it had been ratified or acceded to by only four states (Norway, France, Congo and Belgium), which account for only 2.27% of the world fleet.[11]

Regulation 1257/2013 on Ship Recycling

In order to speed up the agreements made under the HKC, the European Union has adopted the SRR. The SRR entered into force on 30 December 2013. It does not only implement the HKC at European level, but it also introduces some additional, stricter measures. The main addition is the European List of recycling facilities: vessels flying the flag of an EU Member State can only be recycled at facilities included in that list. Facilities need to be approved by the individual Member States (for yards within the EU) or the Commission (for yards in third states).[12]

In addition, all vessels – irrespective of their flag – entering European ports will need to carry an Inventory of Hazardous Materials (IHM).[13] An overview of the relevant hazardous materials is given in the annexes to the regulation.

10 Regulation (EC) No 1013/2006 on shipments of wastes.
11 IMO, Summary status of Conventions, http://www.imo.org/About/Conventions/StatusOfConventions/Pages/Default.aspx.
12 Article 16, Regulation No 1257/2013.
13 Pursuant to Article 32 (2) (a) and (b) SRR this requirement applies to EU-flagged vessels as from 31 December 2014 and to non-EU flagged vessels as from 31 December 2020.

The SRR is mainly applicable to vessels flying the flag of one of the Member States.[14] The only exception is article 12 of the SRR, stating that non-EU flagged vessels calling at EU ports shall carry an IHM. The fact that the recycling-related obligations of the SRR apply only to vessels flying the flag of a Member State has caused concerns that these European rules can be circumvented through timely re-flagging of the vessel.

The 2013 proposal for a Ship Recycling Fund

During the legislative process for the adoption of the Regulation in the Spring of 2013, the Environment Committee of the European Parliament drafted a proposal for a Ship Recycling Fund. The concept consisted of a levy system whereby each vessel entering a European port would have to pay € 0.03 per gross tonne (GT) to a centralised fund. It was assessed that the port dues in European ports would increase and that traffic evasion would be limited. This proposal was made in the form of a draft amendment to the European Parliament's plenary assembly in April 2013, but the latter rejected the proposal, by a narrow margin. The main arguments against the proposal were: the lack of sufficient elaboration of the option; that it was unclear how the levy would be implemented; and the possible negative impact the levy would have on the competitiveness of EU ports.

Actions taken since the adoption of the SRR

The European Commission is preparing the first European List of recycling facilities. This list will include recycling facilities in Member States. The exact date of application of the SRR's main requirements will depend on the recycling capacity available on the list – the recycling facilities included in the list should jointly have a minimum recycling capacity of 2.5 million light displacement tons. The main requirements of the SRR will apply as of six months after the recycling facilities included in the list have achieved this minimum capacity.[15]

1.5. Problem identification

The current SRR is an important step towards the establishment of safe and sound ship recycling practices. However, the costs of re-flagging a ship to a flag of convenience are low compared to the expected loss of revenue for ship owners resulting from compliance with the stricter recycling rules under the SRR. Without the ratification of the HKC, stricter ship recycling rules would apply only in Europe, hence incentivising circumvention of the SRR through re-flagging.

As indicated in table 1.2, at present (2014 data) some 106 EU-flagged ships were dismantled. About 39% of these ships were dismantled in sub-standard facilities in South Asia, which offer the highest demolition rates (hence pointing to financial optimisation behaviour of ship owners). Without any additional mechanism, these ships would be facing additional costs for safe and sound recycling, which might be significant (see section 3.5) and are likely to offset the additional costs related to re-flagging, which are minor). As yet it is unknown how many ships will resort to re-flagging once the SRR has fully entered into force.

To some extent, the above reasoning might also be valid for ships that are currently being dismantled at Chinese and Turkish shipbreaking yards or in Europe. However, other factors come into play for these ships (e.g. transportation costs) as these countries already offer lower demolition rates in general than South-Asian yards, which make them less sensitive to circumvention of the SRR by re-flagging. It is expected that these countries will introduce clean and safe recycling according to the SRR.

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14 Article 2.1 SRR.
15 Article 32 (1) (a) SRR.

Apart from circumventing the SRR, re-flagging of ships can have additional negative consequences, as EU flag rules are not anymore applicable to re-flagged ships. This may, for instance, have additional negative consequences in e.g. following national EU Member State labour and environmental regulations.

Future developments influencing the problem

Apart from the fact that the SRR is stricter than the HKC, it may take quite some time before the HKC enters into force (this requires that at least 15 countries have ratified, whose fleet should account for at least 40% of the world fleet in GT and whose recycling volume should at least cover 3% of the world's fleet[16]). It is in fact uncertain whether it will ever enter into force.

1.6. Aim of the study: a financial instrument to incentivise safe and sound ship recycling

In view of the above considerations, the challenge for a successful introduction of EU requirements for green ship recycling is to overcome the possible circumvention of the SRR through re-flagging by lack of an economic incentive for ship owners to follow the new European rules.[17] One way to address this issue is through the introduction of a financial instrument.

The possibility for the European Commission to create a financial incentive is provided in Article 29 of the SRR. The provision states that the Commission shall report before the end of 2016 on the feasibility of a financial instrument that stimulates safe and sound ship recycling. If needed, a legislative proposal can accompany the report.

The aims of the study are therefore to build upon the work previously carried out, to design an operational financial instrument that addresses the key issues and is feasible under current and foreseeable market realities.

1.7. Structure of the report

Chapter 2 is the central chapter of this report in which the various options are presented and elaborated, while chapter 3 provides the starting point for the assessment of options by presenting and analysing data and establishing a baseline for the world fleet, port calls, as well as for the costs (foregone revenues of the ship owner) of sound recycling of ships. In chapter 4, the impacts of a financial instrument are assessed. Finally, in chapter 5 a possible roadmap to implementation of the preferred option is given.

16 Art 17.1.1 HKC.
17 Milieu & COWI (2009).

2. DESIGNING A FINANCIAL INSTRUMENT

2.1. Introduction

In this chapter, the key elements for the introduction and design of a financial instrument are presented. Firstly, a review of the literature is presented (section 2.2) followed by an elaboration of the main design elements – of which many are valid for multiple options (section 2.3). Based on these design criteria, a first set of options is assessed. These options stem from earlier studies and were included as references in the Terms of Reference of this study. First the issue of the scope of the instrument is addressed (in particular EU flagged ships versus all ships calling at EU ports in 2.4), followed by an assessment of the first set of options identified (2.5). Based on this assessment, conclusions are drawn on the feasibility of the different options and an additional, new option is introduced and assessed on its feasibility, with the objective to overcome the weaknesses of the earlier options (2.6).

2.2. Literature review – conclusions from past analyses

The focus of the literature review is on the four studies describing different financial instruments to incentivise ship owners to scrap their vessels in a safe and sound manner. The aim of this review is to highlight the main features of the instruments proposed in the earlier studies and to ensure that only the successful factors of the previous instruments are subsequently considered in this study.

The four main studies on possible financial instruments and the different options that were considered are presented below:

Title of publication	Author	Publisher	Year of publication	Options considered
The Ship Recycling Fund	Ecorys	Greenpeace	2005	▪ Ship Recycling Fund.
Study in relation to options for new initiatives regarding dismantling of ships	Cowi & Milieu	DG ENV	2009	▪ Ship Recycling Fund.
Financial mechanisms to ensure responsible ship recycling	Profundo	Shipbreaking Platform	2013	▪ Ship Recycling Fund; ▪ Ship recycling account; ▪ Ship recycling insurance (SRI), also referred to as a ship life insurance.
Financing the environmentally sound recycling and treatment of ships	Milieu	European Parliament (Impact Assessment)	2013	▪ Ship Recycling Fund; ▪ Ship recycling guarantee (SRG); ▪ Ship Recycling Account; ▪ Ship recycling insurance (SRI), also referred to as a ship life insurance.

The different instruments and the main findings of these studies are summarised below.

Ship Recycling Fund

All four sources agree that the aim of the fund would be to close the financial gap between conventional and green ship recycling, and therefore provide incentives for ship owners to choose environmentally sound ship recycling (Profundo 2013).

While there is little information on the governance of the fund, the Ecorys 2005 study (which addresses the issue at a global rather than an EU scale) proposed that the fund should be set up under the auspices of a UN organisation (IMO, ILO etc.).

In view of the introduction of a global instrument, the Ecorys 2005 study proposed that the fee should be levied on newly built vessels, together with the registration of an IMO number. However, all other sources (which focus on the introduction at a European level) convene on charging ships, of both EU and non-EU flags, upon entering EU ports. Milieu & Cowi 2009 and Milieu 2013 estimated this fee to be around $200 per call, or $0.04 per GT (or €0.036[18]). The Profundo 2013 study did not make concrete estimates, but suggested that fees should be dependent on ship size, type and frequency of call (i.e. differentiate between short and long distance shipping), which was also encouraged in Milieu 2013 study.

According to the Milieu 2013 study, the fund would provide a subsidy directly to certified recycling facilities for each ship recycled within environmental standards. The level of subsidy (the incremental cost of sound recycling) would depend on annually revised guidelines and would be specific to the ship type/size, its hazardous waste inventory, etc. Furthermore, the Profundo 2013 study suggested that such calculations should be done by one of the authorised certification bodies (such as classification societies).

In other words:

Upon each entry to an EU port, a fee would be levied on each ship and the money would be channelled through the EU recycling fund as a subsidy to recycling facilities to cover the incremental costs of sound recycling, for each ship recycled in accordance with the SRR requirements.

The Milieu 2013 study proposed that the subsidy paid to recycling yards would be available only for ships flying the flag of an EU Member State for at least two years prior to the approval of the recycling plan, whereas the levy would be raised on all ships calling at EU ports. However, the Profundo 2013 study argued that such an arrangement would be contrary to the WTO non-discrimination principle. In order not to face legal objections, Profundo 2013 recommended imposing a disbursement mechanism for both EU and non-EU flagged vessels.

The Profundo 2013 study argued that there is a legal precedent for imposing such a fund (ECJ 2011 judgement on Case 366/10). Similar mechanisms already in existence include the Dutch ‘car recycling fund’, although the later cannot easily be compared with, as the market it targets has different characteristics than ship recycling.

Finally, an amendment to the SRR introducing this fund levy – based on the designs set out in the Milieu 2013 study – was put to the vote in the plenary in April 2013, but it was rejected by a narrow margin. The European legislators did however call upon the European Commission to report by the end of 2016 on the feasibility of an incentive-based system (the starting point for this study).

18 Conversion done on the basis of average $ and € exchange rate for Q1 2015.

Ship recycling insurance

The Milieu 2013 study defined a ship recycling insurance as an "insurance against damages caused to the environment or to people resulting from unsound recycling". This proposal addressed a key point made in the Profundo 2013 study, which pointed out that there is a reasonable possibility that insurers will refuse to insure old vessels. In order to reduce the possibility of this happening, it was suggested that the introduction of an instrument that can be characterised as a "liability insurance product", rather than a mere "life insurance product", would be beneficial.

Both the Profundo and Milieu studies suggest that ships (EU and non-EU flagged alike) calling at EU ports should be obliged to carry a certificate as evidence that the required insurance is in place for the ship. The insurance should be obtained from an accredited insurance company. Once the vessel is recycled at an accredited facility included on the European List, the insurance company would reimburse the assured, upon proof of safe and sound recycling.

The insurance would cover the cost difference between sound and unsound recycling. This difference may vary between vessel types and sizes. The two studies propose that the private sector is best suited to forecast the future monetary difference between sound and unsound recycling. Their forecast needs to be based on, for instance, the type of ship, the timeframe, and the market conditions. In addition, they would be allowed to charge a premium to cover their own risk.

> ***In other words:***
>
> *Each ship calling at EU ports must have a certificate stating that it is insured. The insurance would cover the difference between sound and unsound ship recycling. To cover this, the monthly/annual fee, to be paid by the owner, would be calculated by the insurance company. Once the ship is recycled in a sound way, the difference would be reimbursed by the insurance company.*

The Profundo 2013 study explained that this arrangement would ensure that even in case of bankruptcy or default of the owner, the higher costs of sound recycling are covered. At the same time, the owner is protected from uncertainty concerning the risk of possibly higher than anticipated costs of sound recycling at some point in the future.

Lastly, upon the sale of a ship (as the Milieu 2013 study explained), it would be the responsibility of the new owner to ensure that a new insurance of the ship is issued, while the insurance company would be responsible for deciding the structure and the premium of the insurance policy.

Although the Profundo 2013 study described some similar existing products, these mainly relate to unforeseen (environmental) accidents. Such a ship recycling insurance product would therefore need to be created or, as the Milieu 2013 study proposes, be attached as an amendment to the existing Directive 2009/20/EC on the insurance of ship owners for maritime claims.

Ship Recycling Escrow Account

The Profundo 2013 study proposed the set-up of a Ship Recycling Escrow Account that would serve as a savings account, kept at a financial institution, to finance the incremental costs of responsible ship recycling. The owners would make at least minimal annual deposits per ship and proof of such deposits would be carried aboard the ship in order to gain access to EU ports.

The study proposed that the incremental costs would be calculated by independent certification bodies (such as classifications societies) based on the type of ship and divided by 20 years (standard depreciation period for ships). The study estimated that the annual minimal deposit would need to be at an average $37,500 per ship (approximately € 34,000).

Given that the escrow account would be attached to the ship and that proof of payment would be a mandatory requirement for entering EU ports, the sale of a ship would not require any additional procedures, besides the actual sale transactions and contracting, and the transfer of the account to the new owner.

The monies accumulated in the escrow account would be paid by the financial institution to the ultimate owner, upon proof that the ship was recycled in an environmentally sound manner in one of the accredited facilities. This implies that the risk of the future costs of sound recycling is taken by the owners, who may then want to insure the said risks.

In other words:

Each ship owner would open a normal savings account attached to a specific ship and make (at least) annual minimum contributions. They would need to provide proof of these contributions in order to enter EU ports. Once the ship is recycled in an environmentally friendly manner, the deposits and the interest accumulated would be released to the ship owner.

The Profundo 2013 study elaborated that in addition to this escrow account, there would be a need for a transitory fund for the recycling of older ships (those built more than 15 years before the financial mechanism comes into effect). For a transitional period, there would be an additional surcharge on the annual deposit, also collected by the financial institution. The money would then be used to subsidise the difference between the money accumulated in the escrow account and the total incremental costs of sound recycling. Interestingly, the Profundo 2013 study proposed that as the fund would be filled with regular annual contributions, it would be able to raise money (for instance through an EIB loan) to cover the higher subsidies in the early years. As time passes and the share covered by the escrow account increases, the amount of subsidies could decline, thus allowing for the fund to repay such loans.

Ship recycling guarantee

The Milieu 2013 study described the guarantee as: a deposit of funds, a mortgage on the ship owner's property, or any other notarised commitment to the payment of funds required by a competent authority, sufficient to cover the costs of sound ship recycling.

In other words:

The owner would be obliged to equip their ship with a guarantee equivalent to the incremental costs of sound ship recycling.

The requirement would hold for both EU and non-EU flagged ships. EU ports would require proof or a certificate of this guarantee as a condition precedent to granting access to the port.

The guarantee would be released (the money would go back to the ultimate ship owner) upon proof that the ship had been recycled in an environmentally sound manner in an EU approved facility. In the absence of such proof, the guarantee would be enforced and the total value of the guarantee would be transferred from the guarantor to the EU recycling fund for promoting and supporting sound ship recycling.

In other words:

In the event that sound ship recycling does not take place, the owner would lose the money set aside in the guarantee and effectively pay a "fine" for not following regulations. The money would then be used for other related purposes through an EU recycling fund.

Issues to be considered when designing the guarantee, account and insurance options:

According to the Milieu 2013 study, the challenges that need to be overcome for the three options to be effective include:

- The set-up time needed by different MS and financial institutions may vary;
- Older ships would require higher contributions as they are closer in time to being recycled (a standalone guarantee could therefore encourage re-flagging of old ships before the instrument is operational). Furthermore, if it is designed that older ships need to contribute more, the regime would face objections from a WTO compliance perspective (see annex B for a detailed review of WTO compliance);
- Setup administrative costs of establishing rules and recurring costs for oversight of system;
- For financial institutions there would be initial costs of creating a new financial product and assessing risks;
- If only EU financial institutions would be allowed to create such guarantees, it could provide an advantage for EU-owned ship owners as they may have easier access to such institutions than non-EU owners – the alternative of allowing non-EU financial institutions to provide the guarantee needs to be examined.

2.3. Design elements valid for multiple options

After reviewing the instruments proposed in previous studies, it appears that the different financial options often have similar key design elements. The common design elements are addressed first, followed by a detailed analysis of the possible options and the accompanying indication of impacts.

The following common design elements are discussed:

1. Relation with the public policy objectives of the SRR;
2. Overall objective of the instrument;
3. Underlying concept behind the instrument;
4. Capital amount to be accumulated;
5. Purpose of the release of the capital amount;
6. Duration of capital accumulation;
7. Scope of applicability of the instrument;
8. Conditions for the release of the capital amount;
9. Role of the provider of the instrument (public or private);
10. Role of a public Ship Recycling Fund;
11. Role of a public ship recycling authority/agency;
12. Enforcement mechanism;
13. Link with the ship and transferability of the financial instrument to a new ship owner.

In the following sections, these design elements are further elaborated.

1. Relation with the public policy objectives of the SRR

The rationale for this study into a financial instrument to facilitate safe and sound ship recycling coincides with the policy objectives as stated in the SRR. In Art. 1 "Subject matter and purpose" of the SRR, the public policies pursued by this Regulation are defined as follows:

- to prevent, reduce, minimise, and to the extent practicable, eliminate accidents, injuries and other adverse effects on human health and the environment caused by ship recycling;
- to enhance safety, the protection of human health and of the European Union's marine environment throughout a ship's life-cycle; in particular to ensure that hazardous waste from ship recycling is subject to environmentally sound management;
- to ensure the proper management of hazardous materials on ships;
- to facilitate the ratification of the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships.

Furthermore, Art. 29 SRR explicitly charges the European Commission to submit to the European Parliament and to the Council by 31 December 2016 a report on the feasibility of a financial instrument that would facilitate safe and sound ship recycling, and, if appropriate, accompanied by a legislative proposal. As follows from Recital 19 of the preamble to the SRR, the Commission was charged with this task "in the interest of protecting human health and the environment and having regard to the 'polluter pays' principle". Furthermore, this recital clarifies that the report concerns the "feasibility of establishing a financial mechanism applicable to all ships calling at a port or anchorage of a Member State, irrespective of the flag they are flying, to generate resources that would facilitate the environmentally sound recycling and treatment of ships without creating an incentive to re-flag".

2. Overall objective of the instrument

The overall objective of a possible financial instrument to facilitate safe and sound ship recycling is essentially to change undesired behaviours of ship owners. The aim is to induce a change in the conduct of ship owners towards the recycling of their ships in compliance with the SRR and to avoid re-flagging behaviour to circumvent the SRR. The SRR, which incorporates the requirements of the HKC, imposes an obligation upon ship owners to recycle their ships at ship recycling facilities included in the European List (Article 16 SRR). At present, however, this obligation can easily be evaded by ship owners through timely re-flagging of the ship to a non-EU flag.

Furthermore, ship owners experience a perverse financial incentive when selling their ships for recycling, contrary to the social and environmental standards that have been introduced under the SRR. This is due to the fact that a compliant ship recycling facility must deduct the costs involved in maintaining such standards from the scrap (or residual) value (minus profits) of the ship. The scrap value is the price that the recycling facility pays to the ship owner in return for the vessel. If the local legal system and the business model allow a non-compliant ship recycling facility to mostly ignore these social and environmental standards and avoid the related costs, the result is that the latter ship recycling facilities can offer ship owners higher scrap values. This would place SRR-compliant *ship recycling facilities* at a competitive disadvantage towards non-compliant ship recycling facilities.

In order to achieve the desired change in the behaviour of ship owners to scrap their ship at sub-standard yards and to re-flag their ships at the end of their life, a financial

incentive needs to be created which makes it more financially attractive for ship owners to comply with the SRR standards for safe and sound ship recycling.

3. Underlying concept

The basic idea common to all financial incentives discussed in sections 2.4 and 2.5 below is that – during the operational life of the ship – ship owners are compelled, directly or indirectly, to contribute periodically to the accumulation of a certain capital amount. This amount is tied to the ship and is, at a later stage, to be released for the benefit of the ultimate ship owner only when the ship has been recycled safely and soundly at a facility on the EU List.

Therefore, in essence, the contribution is not a charge or a tax. Rather, it is a premium, which generates credit to the future payment of a capital amount, which will benefit the ultimate ship owner if the ship is recycled in compliance with the SRR. If, however, this ship owner were to opt for a non-compliant ship recycling facility, then as a penalty the ship owner shall forfeit the credits to the future payment. The capital amount accumulated in relation to the ship shall instead be transferred to a general fund, controlled and administered by a public entity (see e.g. item 10 below, the Ship Recycling Fund), and committed to achieving the objectives of safe and sound ship recycling.

4. The capital amount to be accumulated

For the design of the financial instrument, irrespective of its form, it is necessary to understand the amount of capital that it should raise. After all, the overall objective of this capital amount is to incentivise the desired behaviour – that is, safe and sound ship recycling at approved facilities instead of non-sound recycling practices. This implies that a financial incentive should be of such a level that it outweighs the current financial disincentive of sound scrapping (the lower revenue for the ship owner).

To define the capital amount required, the following elements need to be taken into account:

1. What should this amount cover as a minimum? In short, it should cover the extra costs of safe and sound ship recycling compared to unsound ship recycling practices – in other words, the lost revenue for the compliant ship owner. In section 3.4, a methodology to estimate this capital amount is elaborated further.
2. How should the capital amount be defined? Again, the methodology presented in section 3.4 could be a basis for this.
3. What procedure can be used to define the amount to be accumulated? This procedure can be:
    - Specifically defined for each individual ship that wishes to enter a particular regime. This implies that for each applicant, whether it is a new-build ship or an existing ship already operational, a review needs to be made of the expected amount needed to cover the aforementioned revenue gap between sound and unsound recycling;
    - A standardised approach applicable to all vessels. This standardised approach would aim to simplify the procedure and to lower the administrative burden for entering a particular regime. The standardised approach could take the form of a tariff table, which differentiates according to ship types, size classes, and other main factors influencing the price gap. Alternatively, it could take the form of a formula based on key cost factors identified. In any case, there needs to be a clear relation between the capital amount to be accumulated and the actual costs of sound recycling;

    - A procedure to periodically review or revise the defined capital amounts. The cost gap between sound versus unsound recycling is unlikely to remain constant and may change over time – for instance due to technological

progress resulting in more efficient sound scrapping practices, or increased demands on working conditions or higher environmental standards that also affect the costs of non-sound recycling. In an ideal case, the costs would converge as unsound recycling practices gradually disappear, or if current unsound practices gradually improve towards the levels required under the SRR.

4. What requirement needs to be set in the instrument with regards to this capital amount? The instrument should provide clear, and easy to apply, rules on the capital amount to be accumulated.

5. Purpose for the release of the capital amount

With regards to the release of the capital amount, which is closely connected to the sound recycling of ships, two fundamentally different approaches can be considered:

1. Payment of the amount directly associated to the individual ship that is (to be) recycled, and for which the amount is accumulated. As already shown in previous studies, this is the standard approach for a Ship Recycling Escrow Account, a Ship Recycling Guarantee and a Ship Recycling Insurance, which are all, by their nature, instruments intended for a pre-defined use. However, this approach could also be applied in the case of a fund, if contributions made (related to port calls) are earmarked for the individual ship for which they were paid;
2. Payment for other purposes contributing to increased levels of sound recycling that are not (necessarily) linked to the recycling of an individual ship. Such an approach would not match the principles of a private instrument (SRG, SRE, SRI) and can only be relevant for a public licence (levy) and fund mechanism. Instead of using the capital to directly compensate for the revenue gap of the ship owner (whether paid to the owner, the recycling facility or otherwise – see item 8 below), the accumulated capital could also be used for purposes not connected to the recycling of an individual ship, but rather for lowering the barriers to sound recycling at a broader level. As such, the amount could operate in a similar way as subsidies used in other sectors, for instance:
    - Applications for a financial compensation to ship owners that opt for sound recycling of their ship, but that do not possess a SRI/SRE/SRG for that specific ship, or for a ship for which insufficient funds have been accumulated at the time of recycling.
    - Applications for financial support to upgrading ship recycling facilities to the required standards of the SRR.

Obviously, the capabilities of a public fund to subsidise the above activities are limited to the amount available at a given time. Furthermore, it would be necessary under this approach to establish that EU rules on state aid are observed.

6. Duration of the capital accumulation scheme

Ideally, the accumulation of a substantial sum of money is done over a long period of time. Spreading the collection of money over an extended time frame makes the carrying of these costs bearable for an economic operator (in this instance, a ship owner). In addition, it becomes possible to accumulate capital through returns on capital realised through proper financial management. Returns on capital in turn reduce the net amount that the operator must contribute annually. If the time frame is shorter, higher annual input contributions are necessary to accumulate the same capital amount, affecting the cost structure and thus the competitiveness of the operator concerned.

In particular, the SRE, SRI and SRG alternatives are based on the principle of a financial instrument that builds up over the economic lifespan of the ship. In all three mechanisms, capital is being collected over a longer period of time, based on regular (e.g. annual or monthly) contributions by the ship owner related to a particular ship, that, combined with returns on capital over the duration of the financial mechanism, should ultimately suffice to cover the extra costs of sound recycling.

In the previous studies, it was often assumed that the payment period would be equal to the lifetime of a ship.[19] However, the lifespan does not necessarily need to be the same for every ship and every ship owner. Bilateral agreements on the duration and contribution levels can be negotiated between an individual operator and a supplier (e.g. a bank, insurer or other financial institution). This would allow ship owners to enter into a regime not only when a new-build ship is delivered, but possibly also at a later stage.

It is also possible to design the regime so that although its duration is as long as the expected remaining lifetime of the ship, the structure of contributions is not linear. For instance, there could be higher contributions in early years and lower amounts in later years, aligned with the financial capacity of the owner/operator concerned (and/or the market in which it operates). This approach would allow ship owners to enter into a scheme in later years instead of on the year the ship is newly delivered.

One factor of uncertainty that influences the duration of the capital accumulation relates to the length of the economic lifespan of a ship. Although averages can be calculated, these lifespans tend to vary over time due to market incentives for earlier scrapping (e.g. an economic crisis causing overcapacity in the freight market) or later scrapping (e.g. a shipping boom causing high freight rates and calling for more ship capacity). If recycling is opted for at an earlier stage than the previously defined duration assumed by the instrument, the attractiveness of safe and sound recycling may decrease as not enough capital is accumulated. To avoid these situations, the required time frame for the financial mechanism could be set at a period shorter than the average economic lifespan – for instance, at the lower levels found (see section 3.23.2 on average ship ages). As a simple rule, if the average lifespan of a ship is 25 years, the capital accumulation could be based on a period of 20 or 15 years, after which no subsequent contributions from the ship owner would be required (with the exception, perhaps, of administrative costs to cover the capital management).

7. Scope of application

For any instrument chosen, its scope of application needs to be defined. In other words: which ships are required to take part in the proposed regime? Various criteria deserve consideration here:

- *EU flagged ships only or all ships calling at EU ports*: Currently, the SRR applies mainly to ships sailing under EU flags (apart from the requirement to carry an IHM which is valid for all ships calling at EU ports). However, as assessed in previous studies (see section 2.2), re-flagging is a major concern to the efficacy of the SRR, which cannot be addressed through a financial regime that applies solely to EU flagged ships. In fact, it could rather incentivise re-flagging at an earlier stage of the lifespan of a ship (even from the moment of construction/start of operation);
- *Age*: For a financial instrument which aims at accumulating a substantial amount of capital, a reasonable time period should ideally be available (see item 6 above). This implies that owners of ships whose remaining lifespan is shorter than this period would not be able to accumulate sufficient capital – or, in order to do so, they would need to provide higher annual sums of capital. To overcome this issue,

19 *In this case, the ship owner starts contributing to the instrument when the vessel is newly delivered and stops contributing once the vessel is sold for recycling.*

a transitional fund could be created at the time of introduction of the financial instrument;

- *Size*: The SRR applies to ships sized 500 GT or above. As a matter of consistency, the financial instrument could follow the same threshold, or another one. For instance, if there is a threshold in recycling costs, another level could be chosen;
- *Type*: The regime could apply to all commercial ships (excluding warships as the SRR also does) and exclude ships of certain types as these types operate in regional waters only and re-flagging and/or recycling in non-sound shipyards is unlikely;
- *Operating profile*: For the same reason, operating profiles could be chosen as a criterion for exempting ships. The SRR itself refers to "ships operating throughout their life only in waters subject to the sovereignty or jurisdiction of the Member State whose flag the ship is flying".[20]

8. Conditions for release of the capital amount: when, to whom and under which conditions?

An essential element of all financial instruments is the regulatory mechanism which controls payment of the accumulated capital amount. When, under which conditions and to whom can the provider of a financial instrument release the funds accumulated and receive full and final acquittal of his financial obligations under this instrument? Furthermore, what procedure applies if the ship owner forfeits the credits to the payment of the capital amount by having the ship scrapped at a non-accredited ship recycling facility? When and under which conditions can the provider of the financial instrument transfer the capital amount accumulated to the (public) Ship Recycling Fund (see item 10 below) and receive full and final acquittal of their financial obligation?

The following elements are to be included in the regulatory mechanism:

- Advance notice in writing of the intended ship recycling at an accredited ship recycling facility, as well as the ready-for-recycling certificate[21] and the ship recycling plan[22] shall be given by the ship owner to both the provider of the financial instrument and the public supervisory Ship Recycling Agency (see item 11);
- Notice in writing of the statement of completion[23] shall be given by the ship owner to both the provider of the financial instrument and the Ship Recycling Agency;
- It shall be the duty of a public organisation (this could be an existing agency or it could be a task assigned to a new Ship Recycling Agency) to monitor and establish whether a ship has been recycled in compliance with the SRR or not. In the former case, such a public organisation would need to issue a declaratory decision to the effect that the financial provider may pay out the capital amount to the entitled party (this could be the ship recycling facility or the last registered ship owner). In the latter case, the Ship Recycling Agency could declare that all rights under the financial instrument in relation to the ship have been forfeited and that the provider of the financial product needs to transfer the capital amount to the Ship Recycling Fund. Operationally, such monitoring might require on the spot monitoring, or may be organised through satellite technology (e.g. AIS and satellite data confirming that recycling of the vessel took place at the indicated EU listed facility);
- In either case, the declaratory decision will be published and notice of it could be given *inter alia* to:
    - The last registered ship owner;
    - The last flag state of the ship;

20 Art 2 (c) SRR.
21 Art. 9 (9) SRR
22 Art. 13 (2)(a) SRR.
23 Art. 13 (2)(c) SRR.

  - The ship-recycling facility where the ship was recycled;
  - The provider of the financial instrument.
- The said declaratory decisions of the Ship Recycling Agency could be subject to appeal to the Court of First Instance of the European Union;
- Once the declaratory decision of the Ship Recycling Agency has entered into legal force and is no longer subject to appeal, the provider of the financial instrument could pay the capital amount in accordance with the declaratory decision to the entitled party or to the Ship Recycling Fund.

9. The role of the provider of the financial instrument

All financial instruments under discussion presuppose the involvement of an independent third-party institution (public or privately operating under some form of public supervision). In relation to the port levy/charges, this is a public body – for instance, the public supervisory agency/Ship Recycling Fund. In relation to the other financial instruments, these are private entities, e.g. a bank or other financial institution in relation to the SRE and the SRG and an insurance company or a group of underwriters in relation to the SRI. Collectively, these independent third-party institutions are referred to here as providers of financial instruments. The role of the provider of a financial instrument is:

1. to collect, at set intervals, certain financial contributions from ship owners;
2. to administrate and manage the accrued funds effectively, in order to reach the relevant capital amount at the relevant future moment;
3. to arrange for payment or transfer of the relevant capital amount in accordance with the declaratory decision of the Ship Recycling Agency once it has entered into legal force;
4. to issue an official document (e.g. a certificate and/or a licence) as evidence that a financial instrument in relation to a ship exists as required by the SRR.

The roles of the provider as described above do not change, irrespective of the organisational form of the provider. It does not matter whether the provider is purely private (e.g. a bank or insurance company), publicly managed, or a mix of public and private actors.

10. The role of a Ship Recycling Fund

Part of each financial instrument will be a ‘public’ fund (though its management might be assigned to a private entity), which could be called the Ship Recycling Fund. Such a fund is not a separate instrument in itself, but comes along with either a port levy or a private instrument (SRE, SRG, SRI). Effectively, the fund needs to be composed of two parts and plays a dual role:

- On the one hand, it can serve as a depository and administrator for all contributions levied from ship owners who wish to access an EU port (Credits Fund for ship owners). In this capacity, it may also register the credits to a future payment accrued by contributing ship owners, in the case that an earmarking of funds associated to a particular ship is envisaged (see item 5 above);
- On the other hand, the Ship Recycling Fund could receive and administer all capital amounts accumulated under (public or private) financial instruments, forfeited by the relevant ship owner when the ship was not recycled in compliance with the SRR. This part of the Ship Recycling Fund could be termed the Public Benefit Fund. This public fund could still be managed privately but under the auspices of a public body (i.e. outsourcing fund management).

The Ship Recycling Fund should execute its tasks independently but in close collaboration with the agency overseeing the financial instrument (the Ship Recycling Agency, see item 11).

11. The role of a public agency (named here as the 'Ship Recycling Agency')

The supervisory task of monitoring the implementation of any financial instrument is a public responsibility (even though this task may be outsourced to the private sector, similar to areas like ship inspection). It could thus be given as a task to an existing agency (EMSA, EEA) or a newly established agency or public institution – which we suggest naming the 'Ship Recycling Agency'. The task could also be outsourced to a private body, which would still require some form of public supervision. The choice between these options requires further scrutiny.

The European Commission could task this agency with the following duties, *inter alia*:

- monitoring the implementation of the SRR;
- issuing certificates to ship owners required to call at EU ports;
- monitoring the collection of contributions from ship owners and the granting of credits to future payments in relation to ships by the Ship Recycling Fund;
- accrediting providers of financial instruments;
- monitoring the recycling of ships generally, establishing whether individual ships have been recycled in accordance with the SRR and issue declaratory decisions accordingly;
- monitoring the payment or transfer of capital amounts by providers of financial instruments further to such declaratory decisions.

To summarise the allocation of tasks between public and private parties, the table below gives a simplified structure.

Table 2.1 Public and private roles

Instrument	Private sector responsibilities	Public responsibilities
SRE, SRG, SRI	Collect money, manage funds, issue certificate of evidence, arrange for payments	Supervisory and monitoring role
Port levy	-	Collect money, manage funds, issue certificate of evidence, arrange for payments
Port fund	Transfer unused funds to the public fund	Manage the fund, allocate to appropriate purposes

12. Enforcement mechanism

As a result of the financial instrument opted for, an authorised third-party (public, or private operating under public law) will issue an official document proving that a certain ship, identified in the said document, is in compliance with the requirements of the SRR. Such an official document, in the occurrence of a SRE, SRG or SRI, is issued upon presentation of a certificate from the private institution to the ship owner, confirming that all financial requirements have been met. Alternatively, a ship owner can apply for this licence upon payment of a fee to a public fund (whether managed publicly or privately). The documents are valid for a limited time span and are periodically renewable, e.g. every year.

The enforcement mechanism will be essentially the same for all financial instruments. The documents need to be present on board the ship at all times and would be made subject to inspection by Port State Control Officers (PSCO) whenever the ship calls at an EU port. Non-compliance with this documentary requirement may lead to detention, expulsion and even banning of the ship from ports in EU Member States. The procedure could be similar to those regarding the Inventory of Hazardous Materials (IHM)[24]. Alternatively, in the case of the SRL, it is conceivable that the existence of a valid licence may also be proven in an approved digital format, e.g. on a website of the Ship Recycling Agency charged with the task of issuing such SRL's. Existing systems such as THETIS and SafeSeaNet could be adapted for this purpose.

13. Link with the ship and transferability of the financial instrument to a new ship owner

An essential feature common to all private financial instruments (SRE, SRG, SRI) is that the capital amount accumulated shall be linked to the ship, rather than to its owner at any time prior to the recycling of the ship. As mentioned, such a connection could also be considered for a public instrument (fees paid for a particular ship that are earmarked to this ship under a public fund). This connection implies at least three elements:

1. Although the current ship owner is obliged to keep and maintain the financial instrument and make the necessary financial contributions, the capital amount accumulated must be detached from the patrimony of the ship owner, so that their possible insolvency would not affect them;
2. When ownership of the ship passes to a new owner, the obligation to keep and maintain the financial instrument and make financial contributions shall pass to the new owner. As a consequence, the provider of the financial instrument (a bank, insurance company or other financial institution) will have to accept the new owner of the ship who was not initially approved by the provider as their client;
3. The ultimate payment under the financial instrument is subject to a condition precedent, i.e. the recycling of the ship. If the recycling was undertaken at an approved ship recycling facility in compliance with the SRR, the capital amount will be paid to the ultimate ship owner or alternatively to the ship recycling facility. If the ship is not recycled in compliance with the SRR, the ultimate ship owner shall forfeit the accumulated amount, which is then paid to the Public Benefit Fund of the Ship Recycling Fund.

2.4. Financial instrument: EU flagged ships or EU port of call

One of the key design factors mentioned above for all financial instruments is whether they apply only to EU-flagged ships or to all ships calling at EU ports[25]. The current SRR applies to EU flagged ships, except for the requirement to have an inventory of hazardous materials on board (in accordance with articles 5 and 12 of the SRR). However the preamble recital 19 of the SRR states: "In the interest of protecting human health and the environment and having regard to the 'polluter pays' principle, the Commission should assess the feasibility of establishing a financial mechanism applicable to all ships calling at a port or anchorage of a Member State, irrespective of the flag they are flying, to generate resources that would facilitate the environmentally sound recycling and treatment of ships without creating an incentive to re-flag."

24 Art. 8 SRR.

25 As also indicated in the Profundo report, in theory more options exist such as EU ownership or ships sailing from EU ports to a recycling facility, but for a variety of reasons as outlined in the report these are not feasible or very effective.

The application of a financial instrument to all ships calling at EU ports is judged to be superior to limiting the regulation to EU-flagged ships alone. Three key arguments underlie this conclusion:

- The possibility of re-flagging as a way to circumvent the applicability of the financial instrument;
- Possibility of infringement with WTO rules;
- Ease of enforcement.

Re-flagging of ships

One of the main arguments to introduce a financial instrument is to create a mechanism which reduces the incentive to re-flag ships under the SRR to circumvent the regulation. However introducing a financial instrument based on EU-flagged ships alone is not expected to avoid this but rather further stimulate re-flagging. If financial instruments are introduced on EU-flagged ships only, ships are required to accumulate capital to eventually overcome the revenue gap between substandard and safe and sound ship recycling. This would indeed create an incentive to avoid putting ships under EU-flags from the start, in those cases where ship owners do not want to be bound by new regulation on safe and sound recycling. Obviously, not all ship owners will necessarily do so as there are clear benefits from keeping ships under EU-flags, but to some extent this behaviour can be expected. Introducing financial instruments that apply to ships calling at EU ports are not hampered by this type of circumvention. In this respect, similarities can also be found in the application of ETS in air transport.

Infringement with WTO rules

Introducing a financial instrument that applies to EU flagged ships only might create tensions with existing international WTO regulation, in particular regulation based on the principle of non-discrimination. This is primarily the case if a financial instrument is created which would benefit only EU ship owners (e.g. by being able to receive payments from a fund which are not fully reflecting the contributions made by that ship owner to the fund, and hence can be interpreted as a subsidy). As Profundo 2013 describes: "*If the disbursement of the fund only concerns EU ship owners, meanwhile the fee is levied from all sorts of ships, EU and non-EU, the fund could be considered as contrary to the non-discrimination principle.*"

A regulation imposing a financial contribution on non-EU companies was held to be lawful by the European Court of Justice in a decision of 21 December 2011 (Case 366/10) on the obligation of non-EU aviation companies to pay for the emission of greenhouse gas under the ETS.

This aspect should also be incorporated in a system which uses EU ports of call as the main design factor, provided that the monies which are built up not only benefit EU-flagged ships, but are equally accessible to all ships that have contributed to the financial instrument.

In the case of an instrument applying to all ships calling at EU ports, WTO compliance also needs to be considered. A refined assessment is included in section 2.6.

Extraterritoriality

Port state jurisdiction can serve as a sufficient legal basis under international law for giving extraterritorial effect to the proposed financial instrument of a ship recycling licence. By seeking access to an EU port, a non-EU flagged ship submits voluntarily to the jurisdiction of the port state, which extends also to prescribing regulatory rules with financial consequences to all ships calling at EU ports.

Failing a comprehensive and exhaustive regulation of the jurisdiction of the port state over foreign flagged ships in Unclos or under customary international law and in the absence of judicial challenges by flag states of extensions of port state jurisdiction, it remains unclear where ultimately the limits of port state jurisdiction lie. Nevertheless, it seems safe to conclude that Unclos and the customary international law of the sea in general and the concept of flag state jurisdiction in particular do not constitute an unsurmountable obstacle to the EU – based upon the port state jurisdiction of the EU member states – giving extraterritorial effect to the proposed financial instrument of a ship recycling licence by making this requirement applicable to all ships calling at EU ports, hence also to non-EU flagged ships.

A more detailed analysis of extraterritoriality aspects is presented in annex C.

Enforcement

According to UNCLOS, coastal states can impose regulations on ships that (voluntarily) sail into their exclusive economic zone or enter one of their ports. This mechanism is reflected in Directive 2009/16 on Port State Control. This Directive introduces a relatively simple instrument to enforce and control existing regulations that are relevant to ships entering EU ports and allows for the possibility to introduce the necessity of having a licence (to show that financial requirements under a financial instrument have been met).

Conclusion

Based on the above considerations, the introduction of a financial instrument based on an EU port of entry principle is judged to be superior to using EU flagged ships as a defining factor. An additional benefit would be that the impact on safe and sound recycling would be much greater as a significantly higher number of ships would be affected by the new regulation/financial instrument.

In applying the financial instrument to all ships calling at EU ports (including non-EU flagged ships) also notice needs to be taken of WTO law (see section 2.7). In principle, WTO law requires that both payments and access to funds should be guaranteed to ships that have called at EU ports.

As a result, the following analysis of the options only focuses on those options which include the EU port of call as a design element and excludes a further analysis of non-financial instruments. As mentioned in the introduction to this chapter first the previously identified option will be assessed on their (technical and legal) feasibility, followed by the introduction of a new option, the ship recycling licence which is intended to overcome the weaknesses of the earlier options.

2.5. Feasibility of pre-identified options

In the Terms of reference of this study the following options were pre-identified, which follow earlier options identified in literature (see section 2.2):

0. SRR in force in its current form (reference/baseline option);
1. Non-financial measures;
2. Ship Recycling Guarantee (SRG);
3. Ship Recycling Escrow Account (SRE);
4. Ship Recycling Insurance (SRI);
5. Port Levy.

The establishment of a ship recycling fund, referred to in the ToR, is not considered an option in itself but is an element which is relevant for several of the above options, as explained in section 2.3.

2.5.1. Option 0: SRR in force

In the reference or baseline option, the SRR as it stands now will apply. This means that the obligation under the SRR to recycle ships at ship recycling facilities included in the European List is applicable to ships operating under an EU flag. As indicated in chapter 1, owners of EU-flagged ships can circumvent the SRR in two ways:

1. Re-flagging of the ship by the same owner: the ship changes the flag in favour of a flag state that does not have the environment regulations stipulated by the SRR and the like, but the owner remains the same;
2. Re-flagging of the ship by a new owner: the owner sells the ship to a new owner, who subsequently re-flags the ship to a flag state that does not have environmental regulations such as the SRR.

Although re-flagging is not illegal, doing so with the direct intention of circumventing the SRR is against the spirit of the regulation.

2.5.2. Option 1: Non-financial measures

In theory, the problem of re-flagging, and thereby circumvention of the SRR, could be overcome by introducing additional non-financial instruments. Two typical solutions would be:

- Extend the SRR to beneficial ownership[26].
  By extending the SRR to beneficial owners, it will not be advantageous for an owner to:
  - use a third party entity to own a ship on paper;
  - be based in non-EU state and flag; or
  - re-flag its ship outside the EU to avoid the SRR.
- Responsibility rests also upon the penultimate owner.
  The responsibility to comply with the SRR does not only rest on the last owner of a ship, but also on its penultimate owner. The aim of this solution would be to ensure that if any sale (which in itself is completely legitimate) takes place, the aim of the sale is not to circumvent the SRR. The administrative burden and responsibility both rest with the penultimate owner, who therefore has to ensure that the subsequent owner of the ship complies with the regulation.

The first solution would not solve the problem: it would actually lead to new circumvention mechanisms as European ship owners can simply change the ownership from an EU-based company to a company based in a non-EU state, through setting up separate subsidiaries in different states. Managing and owning ships through separate subsidiaries in non-EU countries is already a common practice in the shipping community. An option to overcome this pitfall would be to hold the (European) parent company liable. However, as also noted in earlier studies (see Profundo 2013), a parent company cannot be held automatically liable for the actions of a subsidiary both under European and international private law.

The second solution – based on penultimate ownership – could potentially overcome the disadvantage of the first solution as the first European owner would here be held responsible for ensuring that the next owners abide by the SRR, even if the ship changes to a non-EU flag or a non-EU owner. The key weakness of this instrument is the lack of possibilities to enforce the regulation after the initial sale of the ship. This solution could even reduce the attractiveness of ships falling under this obligation for potential buyers, as the ship would be sold with an additional obligation (without

26 *IHS Fairplay defines beneficial ownership as follows: (…) the parent company of the Registered Owner, or the Disponent Owner if the ship is owned by a bank. It is the controlling interest behind its fleet and the ultimate beneficiary from the ownership. http://www.ihsfairplay.com/About/Definitions/definitions.html.*

having any financial compensation built in), hence exerting a downward pressure on prices. This, in turn, may create new circumvention behaviour where ships are already put under non-EU flags at the start of their lifetime to circumvent the regulation.

An alternative non-financial option could be to see whether the obligations under the Basel Convention which establishes a ban on exports of hazardous waste to countries that are not members of the OECD can be strengthened. However this approach falls outside the scope of the current study.

It was also suggested to reactivate the 1958 Geneva Convention which requires a 'genuine link' between flag and ship owner. This is repeated in article 91 of UNCLOS. In the 1980s it was tried to establish a convention on the requirements for registration of ships, but this never reached the stage of ratification, and it is not likely that it would do so today.

An international example of a non-financial scrapping scheme is found in China. The Chinese scrapping system is compulsory for Chinese ship owners in case their vessel is qualified as old and worn ship. In such a case, the ship owner can obtain a subsidy to scrap his vessel, which qualifies the Chinese system as a mere subsidization scheme aiming to reduce over-capacity on the Chinese shipping market. As the scheme is seen as a subsidy, a similar scheme cannot be adopted in the EU, as the scheme would not be in line with EU state aid rules. In addition, it can be argued that such a scheme would not be in line with the principles of the SRR, as the SRR aims to improve scrapping activities, while the Chinese scheme mainly aims at a reduction of shipping overcapacity by promoting the scrapping of older vessels.

2.5.3. Option 2: Ship Recycling Guarantee (SRG)

A SRG ensures that a third-party financial institution, such as a bank, will make a future payment if the preconditions defined in the guarantee are met. In practical terms, this means that the ship owner has entered into certain financial obligations towards the bank, which will be secured by forms of collateral such as a ship mortgage. An advantage of an SRG is that, from day one, payment of the fixed amount is guaranteed, even if the ship owner becomes insolvent or the ship becomes a constructive total loss due to a maritime casualty.

However, there are a number of practical issues to consider before the viability of this option can be ascertained. Firstly, in order to be able to issue a SRG at the request of a ship owner, the bank needs to secure the possible repayment of a large amount by the ship owner. If the bank, in its relation with the ship owner, provides a loan in combination with a savings scheme, the risk remains that the ship becomes a constructive total loss due to a maritime casualty before the full capital amount has been accumulated. If this risk materialises, the bank is exposed to a liability greater than the security they received from the ship owner. As a result, the bank will require that the ship owner locks up part of its equity with the bank, gives collateral in the form of – for instance – security rights on the ship (mortgage) or on rights to future payment (pledge) to the bank. A combination will mostly be required.

These requirements will make it difficult to transfer the SRG to the new owner if the ship is sold. Alternatively, the bank could cover the risk of the vessel becoming a constructive total loss by obtaining insurance against this risk. This can be done by incorporating the premium payable into underwriters in the commission or into charges payable by the ship owner to the bank.

Secondly, the regulatory rules applicable to banks are strict and banks are obliged to know and verify the identity of all their clients – and under these compliance rules, "clients" refers to human beings. This makes it very difficult for banks to issue a guarantee linked to a ship. The bank can only issue a guarantee for its owner. If a ship is sold to a new owner, the bank is obliged to verify the identity of the new owner.

If the bank, for any reason, cannot accept the new ship owner as its client, the compliance rules require that the guarantee is discontinued. Therefore, a mechanism would be needed to allow the bank to transfer the funds accumulated by the ship owner under the SRG arrangement to the Ship Recycling Fund and to be turned into credits to a future payment in relation to the relevant ship.

Thirdly, from the perspective of the ship owner, the SRG implies a long-term financial commitment to the bank, which might easily last (much) longer than their ownership of the ship.

Fourthly – particularly for ships calling upon EU ports infrequently – it might appear disproportionate to require the ship owner to enter into a scheme of such long duration for the sole purpose of being able to call at EU ports.

2.5.4. Option 3: Ship Recycling Escrow Account (SRE)

A SRE implies that the ship owner is obliged to open an escrow account at an accredited bank or financial institution, to which the owner makes regular deposits which can later be used to pay for environmentally sound ship recycling. In effect, it is a special type of savings account with the following important characteristics:

- The SRE is a blocked or escrow account: this means that the owner is not at liberty to withdraw the money from the account whenever they see fit. Nor is the bank at liberty to give effect to directions from the ship owner. Payments made from the SRE – whether by the ship owner or by the bank – are strictly controlled by the regulations which govern the SRE;
- The obligations under the SRE should be transferred to the new owner if the ship is sold: this means that if the ship is sold, the SRE (and the value accumulated) will follow the ship and is not confined to the previous owner.

The first drawback of the SRE is that, contrary to the SRG and the SRI, it does not guarantee from day one that the required capital amount for the ship will be available. This might cause problems if the ship becomes a constructive total loss due to a maritime casualty at an early stage in its lifetime. In this case, the balance of savings in the SRE will be insufficient: only once the savings scheme has been completed is the full capital amount required for the ship available.

A second drawback, from the perspective of the ship owner, is that the SRE, similar to the SRG, implies a long-term financial commitment to the bank, which might easily last (much) longer than their ownership of the ship.

Thirdly – as for the SRG, particularly for ships calling upon EU ports infrequently – it might appear disproportionate to require the ship owner to enter into a scheme of such long duration for the sole purpose of being able to call at EU ports.

2.5.5. Option 4: Ship Recycling Insurance (SRI)

As pointed out earlier, the use of the term “Ship Recycling Insurance” (SRI) is preferred in order to avoid confusion with the concept of a life insurance, since there is no (human) body as an insured risk involved.

We initially considered the idea of a new, “stand-alone” insurance product which would be compulsory for the ship owner and that was to be linked to the ship itself. This product, as imagined, would consist of two elements. On the one hand a capital amount to be saved for (the part referred to as the capital insurance) and on the other hand a loss insurance, providing cover against the occurrence of a fortuitous or uncertain event. A parallel was drawn with the example of a funeral costs insurance. A part of the insurance premium could accumulate during the “normal” life-span of the

ship to the capital amount needed for safe and sound ship recycling. The other part of the insurance premium would be a risk premium, to cover the risk of the unexpected earlier disruption of the life-span of the ship mentioned (if it occurred).

In the meantime, feedback received from the marine insurance industry suggests that the market strongly doubts the feasibility and challenges the desirability of the delicately composed SRI as initially considered. Many aspects of the novel mixed insurance product were considered highly problematic, e.g.:

- The mixture of a savings component and a risk insurance element;
- The long duration of the insurance contract, in view of the savings element;
- The alleged lack of a fortuitous event;
- The possibility of linking the new mixed insurance contract to the ship;
- The possibility of making it transferable with ownership of the ship.

Furthermore, there appeared to be no appetite on the part of the insurance market and the P&I Clubs to take an active role in developing the initial concept into a workable insurance product.

In view of the above feedback, it was decided not to explore the initial “mixed” insurance product any further. Instead, a new approach has been adopted in which the element of capital accumulation would be clearly distinguished from any (supplementary) loss insurance product. For the accumulation of the capital amount, another financial instrument would need to be created, such as a public Ship Recycling Fund or a private ship recycling escrow-account (as addressed in the other options).

Irrespective of the exact way in which the said financial instrument operated, time would be a critical factor, since any system of capital accumulation presupposes a certain time frame during which the targeted amount can be gathered through periodic payments. This implies that an early end to the ship’s life span, is likely to leave a gap between the amount already accumulated and the amount needed. Because of this gap, the financial incentive for the ship owner to opt for safe and sound ship recycling might be insufficient. However, if a loss insurance would pay out in the event of such a casualty and bridge the said gap if the ship is recycled at a ship recycling facility included in the European List, at least in theory the financial incentive would be reinstated.

Unlike the mixed insurance product discussed earlier, a ship recycling insurance conceived as a pure loss insurance against the risk that the ship will become a (constructive) total loss before its time seems a more realistic possibility. Obviously there is a fortuitous event (i.e. the early constructive loss of the ship). The insured amount could be limited to the difference between the saved amount at the time of the incident and the capital amount required for the said ship. Neither is there a need for a contract of long duration, since the insurance contract could be renewed each year.

Nevertheless, it is doubtful whether there would be sufficient demand on the part of ship owners to enter into such a ship recycling loss insurance on a voluntary basis, even if it is assumed that underwriters would be prepared to offer such an insurance product. This depends in part on how high underwriters will estimate the risk and the level at which the insurance premiums will be set. Apart from this however, for a ship owner to take out such an additional insurance cover, seems only rational, if he is already inclined to opt for ship recycling in compliance with the SRR. At present – admittedly in the absence of a functioning financial instrument – the state of play as to ship recycling as described above in section 1.2, suggests that the vast majority of ship owners would not be so inclined.

In view of the above, the SRI, which is reduced to a loss insurance product is rather an additional design element that can be introduced under one of the other options, than a standalone option in itself.

2.5.6. Option 5: Port Levy

Introducing a port levy is one of the considered options as reported in previous studies. In this option every visiting vessel needs to pay a levy once the vessel enters an EU port. For various reasons, it is important to determine the exact legal nature of the port levy.

From the perspective of tax law, if the port levy is essentially a forced payment to the government and the government does not provide any direct, individual performance to the ship owner in return, the port levy must be considered a (general) tax. In that case the government can spend the revenues from the port levy as it sees fit.

From the perspective of EU law however, it would be problematic if the port levy constituted a general tax, because the Member States have mostly withheld the competence to raise taxes from the EU. This implies that any move within the EU towards introducing a tax measure is subject to unanimous consent within the Council.[27] The EU has no competences in taxation except for those conferred to it by treaties, e.g. customs. In all remaining areas the EU is competent if and to the extent that it has dealt with a tax issue by means of a Regulation or a Directive. In such case the legislative competence has been transferred by the Member States to the EU. The EU has exercised its competences predominantly in the areas of excise duties and value added taxation. However, it has remained reticent in the field of direct taxation.

Alternatively, the port levy could be constructed as a retribution. This is a fee or duty levied regarding a specific, individual service rendered by the government, acting in its governmental capacity. Port dues levied from ships calling at a port in return for the right to use the port and its facilities are a good example. No retribution is due if the government has not rendered any specific services. Neither should tariffs be set in such a way that the projected revenues exceed the projected costs.

The rejected proposal of 2013 for a Ship Recycling Fund[28] envisaged an additional port levy on top of the existing port duties as a way of financing the fund. This approach has its difficulties however. Firstly, the port levy to be collected by the local port does not directly relate to any services provided by that port, but is collected to fund the ship recycling policies of the EU. As a result, the link between the retribution and the particular service offered by the government is rather weak. It is questionable as to whether the port levy can be considered retribution rather than general tax[29]; ultimately this depends on national tax law and national legal concepts.

Secondly, in order to introduce the port levy at EU level, realistically a Directive introducing the levy for EU ports would have to be drafted. Next, this Directive would need to be implemented by the national legislatures, who in turn need to impose rules on local governments and/or port authorities that have the obligation to transfer the EU legislation into local rules. At each stage of this process, problems, mistakes and considerable delay can occur, such as regulatory loopholes and protracted legal proceedings before various courts at the national and the European level.

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27 Articles 113, 115 TFEU.

28 See above § 1.4 under "The 2013 proposal for a Ship Recycling Fund".

29 If the levy becomes a tax, the EU will not have the legislative power to introduce such a tax alone. In case a new tax is imposed on the EU member states a unanimous decision in the European Council is required.

Thirdly, the port levy would require the collection, administration and accounting of port levies at the level of the local ports, followed by the transmission of the collected monies from the local to the national level and finally to the European level. This would probably result in disproportional administrative costs compared to the amounts to be raised.

An alternative to a levy could be to design the instrument in the form of a waste disposal fee. In Box 2.1 below, a review of similar mechanisms in other sectors is made.

Box 2.1 The legal aspects of a waste disposal fee

One of the options considered to finance ship recycling is the introduction of a waste disposal fee. The ship owner needs to pay this fee once he decides to scrap his vessel. The fee will cover the additional costs needed in order to recycle the ship in a safe and sound way. Using a waste disposal fee is not a new instrument. The instrument has been introduced in different sectors, e.g. a waste disposal fee exists for end-of-life-vehicles, batteries, accumulators and electrical waste.

All these fees find their origin in EU law. The EU can introduce legislation regarding waste management, including the obligation to pay a fee. The EU legislative power is based on article 174 and 175 of the Treaty on the function of the EU (TFEU) and waste disposal fees for the above mentioned sectors are all based on this article. For each of the sectors a separate directive has been drafted regulating not only the fee, but also all relevant conditions. A short summary of the directives is included in the Annex.

What the directives have in common is that the basic principles for financing waste management are set at the community level, but the actual setting up of the system is done nationally. Member States can opt for a system that is best suited to their own national system and therefore the operational and financial structure of waste management differs per Member State and per type of product. For each of the products mentioned a different system can be chosen. A large variety of systems focusing on waste management is in place.

However, replicating this system for ship recycling might be challenging. Firstly, under this system, each Member State is obliged to introduce an operational and financial structure. If every Member State introduces its own system, large differences might occur, which could stimulate state shopping in order to select the most beneficial system. Preferably, the fee system should be regulated and operated at a European level – however no examples were found in other sectors, so it is unclear if this would be legally possible.

Another difficulty with regard to the shipping sector is its international character. All examples of waste fees relate to products that are often locally used, or only within the EU. It is relatively easy to design a system for products that do not leave the territory of a state. Ships, however, are often outside the EU and both flag and ownership can easily be transferred to non-EU member states. By doing this they can circumvent the waste disposal fee, thus making this instrument less effective.

2.5.7. Conclusion on pre-identified options

As described above, all pre-identified options have specific shortcomings which would make it difficult to introduce them as EU-wide instruments. Key drawbacks are summarized in the table below:

Option	Main shortcoming
Non financial measures	Easy to circumvent or stimulating additional circumvention behaviour, and/or lack of suitable enforcement mechanism.
Ship Recycling Guarantee	Difficult to transfer in case of change of ownership; disproportionate to ships with low frequency of calls at EU ports.
Ship Recycling Account	Difficult to transfer in case of change of ownership; disproportionate to ships with low frequency of calls at EU ports.
Ship Recycling Insurance	Lack of “insured object” due to lack of unforeseen event, other than loss of the vessel due to an accident. Not feasible as separate instrument.
Port levy	High administrative burden for ports; potentially not WTO compliant; possibly considered as tax (outside the mandate of the EC).

As presented in the above table, non-financial instruments are not judged to be very effective. Although options 2 and 3 would be possible for ships that are not expected to change ownership over (most of) their lifetime, they are less suitable as instruments which would apply to all ships. Option 4 is not feasible as a separate instrument. Finally there are serious questions regarding the legal feasibility of a port levy (option 5). In addition, it would be hard to establish and it would cause relatively high administrative burdens. That option was in fact rejected when first proposed to the European Parliament in 2013.

As an alternative to the port levy, we have identified a new financial instrument – the purchase of a Ship Recycling Licence (SRL) as a mechanism to collect capital at port calls – which overcomes the main weaknesses of option 5. This instrument is further elaborated in section 2.6 below.

2.6. A new option: the Ship Recycling Licence (SRL)

An alternative financial instrument, which overcomes most of the objections of a port levy, involves the introduction of a licence requirement. By obliging all ships that call at EU ports to obtain a prior licence from a centralised European agency, an instrument of a public, administrative law nature is created. This licence requirement can be used to impose a financial instrument upon ship owners, which provides a financial incentive to opt for safe and sound ship recycling as well as a penalty (i.e. forfeiture of accrued rights) in case of failure to comply. Since the purpose for the creation of the licence is to achieve the public policy objectives of the Ship Recycling Regulation, this licence will be referred to below as the Ship Recycling Licence or SRL.

The basic idea behind the SRL is that a contribution is charged from the ship owner, when he applies for this licence. This contribution consists of two elements. The first part, a (small) charge to cover the administrative costs of issuing the SRL, is a retribution. The second part, a premium, is levied from the ship owner, and transferred to the ship-recycling fund, where it is administered separately ("earmarked") in a transparent manner, together with the other capital already accumulated by the relevant ship as an individual credit to a future payment of the same amount.

The amount of the premium levied, depends on the capital amount that needs to be accumulated for the relevant ship and the set time-frame, within which the capital is to be accumulated. The capital amount needed for a particular ship in turn depends on factors connected to the individual characteristics of the relevant ship (e.g. its size and ship type). As discussed in section 2.3, to be effective, the said capital amount would need to bridge the revenue gap between two scenarios. On the one hand where the ship owner opts for ship recycling in compliance with the SRR and on the other hand where he opts for the more lucrative option of non-SRR-compliant ship recycling.

The full capital amount does not become payable until after the ship has been recycled. It is payable to the ultimate ship owner and is subject to the fulfilment of a condition precedent. Only if the ultimate ship owner proves that the ship has been recycled in compliance with the SRR at a ship recycling facility included in the European List, will the capital amount earmarked for the ship, be paid out. If however, it becomes apparent that the ship has been dismantled in a facility not included in the European List, the ship owner forfeits the accrued rights to the payment of the capital amount. Once the forfeiture procedure to be prescribed has been concluded, the capital amount will be transmitted by the Ship Recycling Fund to a general benefit fund in the area of ship recycling. The said procedure will need to be an administrative law procedure at the European level, which allows for the possibility of judicial review.

Contrary to the port levy discussed above, neither of the two elements of the contribution charged in connection with the SRL qualify as (general) tax. Clearly, the minor part of the contribution concerns a retribution since it relates to the administrative costs involved in the handling of the application for the issuance of the SRL. The major part of the contribution, the premium, does not have the legal nature of a direct tax, since the amount levied immediately gives rise to an individual credit to a future payment of a similar or even increased (by interests accrued) amount. Although the premium paid is no longer part of the patrimony of the ship owner, it gives rise to rights to a future payment of the capital amount accumulated. These – transparent – rights are linked to the vessel.

The premium part of the contribution is similar to a premium paid by a private person to a pension fund in relation to his private pension plan. The premium paid (after deduction of costs) is added to the capital amount already accumulated and immediately gives rise to or increases the individual right to future payment(s) of (a) specific amount(s) from that capital amount.

In order to avoid that the SRL and the premium thus levied from ships calling at EU ports work out disproportionally for ships with either a very high frequency (e.g. tugboats and coastal vessels) or a very low frequency of calling at EU ports, the SRL validity would be time-based rather than linked to the number of calls. The duration of the SRL's validity could be differentiated, e.g. offering ship owners the choice to apply for an SRL with a validity of a month instead of a year, and to adjust the premium accordingly, in the interest of ships with very low frequencies of call in EU ports.

In principle it would be possible to introduce also a combination of a SRL, with a private option (option 2: SRG or Option 3: SRE) for those ships for which such an option would still be applicable. This is further described in text box 2.2 below.

Box 2.2 Combination or hybrid option

So far the various alternatives for a financial instrument have been discussed separately from each other. A sub-variant of the SRL would be a combined or hybrid option in which the SRL is combined with an SRG and/or and SRE.

If the Ship Recycling Licence is taken as the basic (public law) approach for the financial instrument, a licence requirement would be imposed upon ships that call upon EU ports. When the ship owner applies for the SRL a contribution is levied composed of an administrative charge (a retribution) and a premium to be transferred to the Ship Recycling Fund. However, it does not follow that the payment of premiums into a public Ship Recycling Fund is necessarily the only permissible option to accumulate the required capital amount. It is conceivable that ship owners would prefer to opt for private system in which they make periodical payments to a SRE kept with a bank. For ship owners, a private mechanism may prove more efficient and may yield a higher return on the capital accumulated and therefore be less expensive than to pay premiums to a public fund.

Such an option raises the question whether the ship owner who applies for the Ship Recycling Licence might be released of his obligation to pay the premium part of the contribution, if he provides sufficient evidence (e.g. through a prescribed certificate to be issued by the financial institution) that he has opted for an approved private financial instrument such as the SRE, or an SRG from an accredited financial institution and that he has fulfilled his financial obligations under that private financial instrument.

Furthermore, financial institutions could offer combined products of a SRE with a SRI. In that case, the SRE is used as the savings instrument through which the ship owner accumulates the required capital amount during the economic life span of the ship. The SRI complements the SRE in providing insurance cover against the risk that due to a casualty the ship becomes a (constructive) total loss prematurely, i.e. before the full capital amount has been saved through the SRE. A similar combination could be imagined between the SRG and the SRI.

Obviously, this would require the design and creation of an adequate regulatory framework governing the private financial instrument itself, as well as the accreditation and monitoring of the financial instrument and the financial institution providing it. Also it raises the question whether it is possible to allow private financial institutions – within clearly defined parameters and subject to accreditation and monitoring by a public authority – to develop alternative financial instruments such as the SRE or the SRG or otherwise and to compete with the public Ship Recycling Fund. This possibility deserves serious consideration, because it would add more flexibility and efficiency to the system. It could also help to broaden the appeal of the financial instrument proposed and assist in bringing about the objective of inducing a change of behaviour on the part of ship owners towards SRR-compliant ship recycling.

It is possible to imagine that under a future amendment to the SRR, the European Commission would be authorized to approve a private financial instrument offered by a financial institution and mandated to draw up legal acts as to minimum requirements that such a private financial instrument should meet.

2.7. Conclusion

Based on the above considerations the following conclusions can be drawn.

- For all financial instruments proposed, application to all ships calling at EU ports is preferred to EU-flagged ships only, for a number of reasons, including the legal feasibility, avoidance of unwanted behaviour (reflagging) and possibilities for enforcement.

- All pre-identified options suffer from serious weaknesses:

  - The options of a SRG or SRE each create a financial incentive for ship owners, and follow the principle of earmarking funds for a specific purpose (sound recycling) of a specific ship. However, individually they are considered less feasible as these more traditional financial products are based on a contractual relation between the financial institution and the ship owner, rather than on a link between the financial product and the ship;
  - These contractual relations between the ship owner and the financial institution providing the financial instrument are not easily transferable to a new ship owner who has purchased the ship. Firstly, the regulatory framework with regard to financial institutions such as banks and insurance companies increasingly requires the bank to establish the identity of the natural person who (ultimately) is their client and to verify the credentials and background of this person. As a result, it might be that compliance rules force the financial institution to discontinue the existing financial instrument for the sole reason that the new ship owner is not a person who the bank or the insurance company can or is willing to accept as their client;
  - Secondly, in the case of a Ship Recycling Guarantee (SRG) the underlying contractual relation between the ship owner and the bank will impose upon the ship owner the obligation to provide collateral to the bank as security and in return for the financial obligation that the bank enters into on his behalf under the SRG. If the ship is sold to a new owner, the contractual relation under the SRG between the bank and the former ship owner will cease and a new contractual arrangement between the bank and the new ship owner would have to be created;
  - The option of a port charge has previously been rejected by the European Parliament, amongst others because of fear for a major administrative burden for port authorities and impacts on port competition. Furthermore it was unclear how funds collected at local level would be transferred to a European fund. More generally, models involving tax instruments are considered unfeasible, as taxation is a competence of Member States rather than of the EU. Models involving forms of retribution however may be feasible, although legislation on this varies among Member States and coherence across countries would be needed to make it work.

- As an alternative to a port charge or levy, a Ship Recycling Licence (SRL) is introduced, which overcomes the main objections of the port levy. In the remainder of the study this SRL is retained as an option rather than the port levy. As a sub-variant a combination of the SRL with the SRE can be introduced. This sub-variant potentially brings additional advantages by offering additional flexibility. On the downside it also create some additional complexity.

In conclusion, the assessment of the feasibility of the previously identified options reveals that all of these have serious shortcomings if introduced on a wide scale. The only option which potentially is able to overcome the identified shortcomings when widely introduced is the Ship Recycling Licence. The impacts of this option, vis-à-vis the reference option (Option 0 “Introduction SRR in its current state”) are assessed in the next chapters. To assess the impacts, first the baseline is further developed addressing the number of ships affected and the costs involved (chapter 3). Based on these underlying data, impacts are then elaborated on in chapter 4.

3. ESTABLISHING THE BASELINE

3.1. Introduction

To assess the impacts of any of the proposed options for a financial instrument, a clear understanding of the baseline is needed. This regards:

- The current world fleet and its characteristics, as well as the envisaged trends of the fleet for the coming 30 years (section 3.2);
- The characteristics of port calls made by ships in EU ports, and how this will evolve in future (section 3.3);
- The supply of ships for recycling (section 3.4);
- The foregone revenue of recycling a ship in a sound manner compared to non-sound recycling practices (section 3.5).

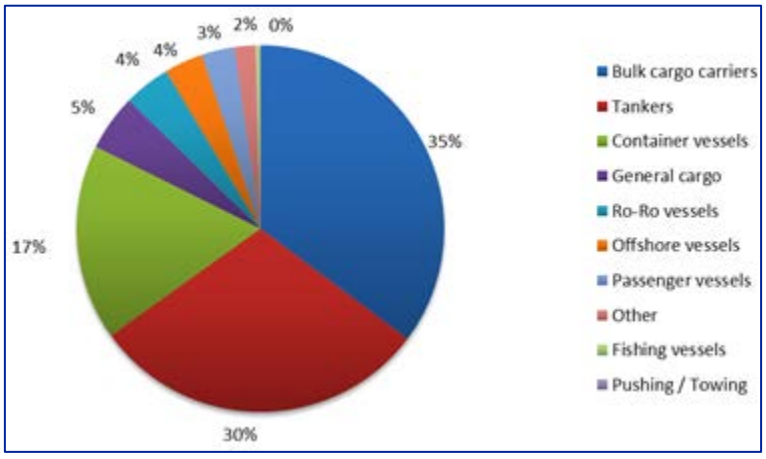
The analysis in the subsequent sections is based on the most recent data available.

3.2. Baseline: the world fleet

Size of the world fleet and main ship types

In 2014, the world fleet consisted of approximately 54,400 commercial vessels larger than 500 GT. In terms of Gross Tonnage (GT), the largest categories of ship types are bulk cargo carriers (35%), tankers (30%) and container vessels (17%).

Figure 3.1 Share per vessel type of the world fleet (calculated in GT, data 2014)

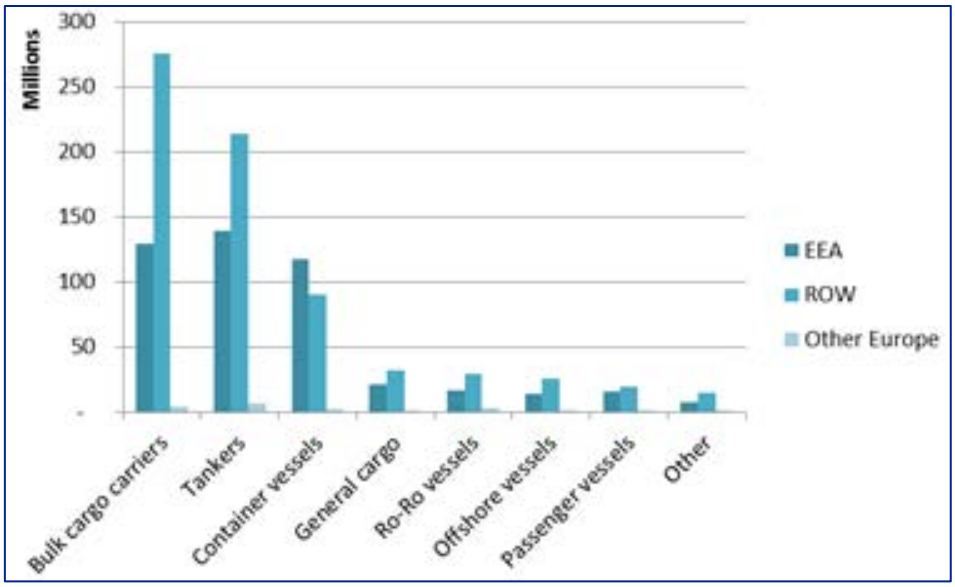


Source: IHS Fairplay + DNV-GL (2015).

Ownership of the world fleet

About 18,300 vessels are registered in an EEA country, i.e. 34% of the world fleet. In some of the categories, the representation of EU owners is higher than this figure: container ships (52%) and passenger vessels (45%). In other categories the share of EEA ownership is lower (see Figure 3.2).

Figure 3.2 Division between EEA and Non-EEA owned ships per ship type (mln GT, 2014)

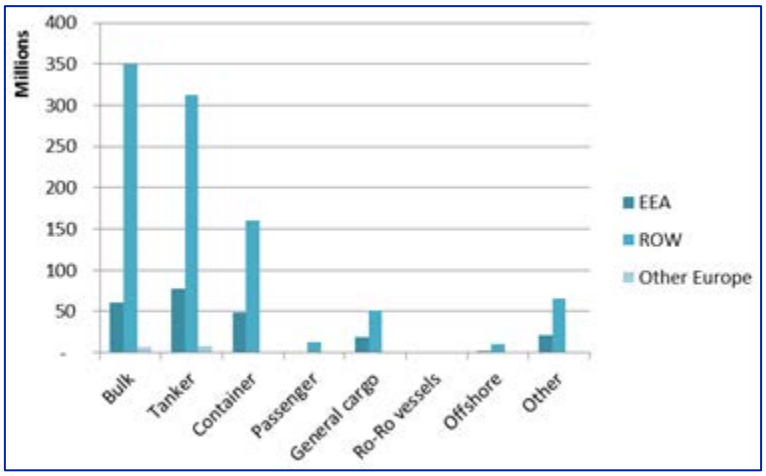


Source: IHS Fairplay + DNV-GL (2015).

Flags of the world fleet

While 34% of the world's ships are EEA-owned, only 19% are EEA-flagged (some 10,220 vessels). Again, these shares vary between the ship types. Fishing vessels (49%), passenger ships (47%) and other vessels (30%) have a higher share of EEA-ownership (see Figure 3.3).

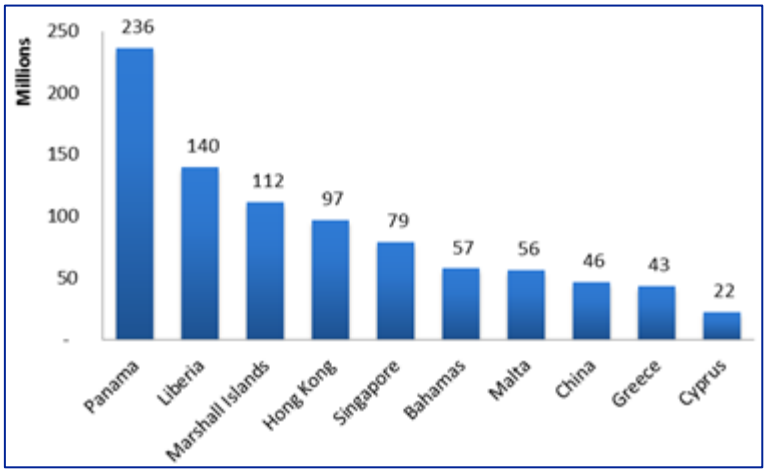
Figure 3.3 Division between EEA and Non-EEA flagged ships (mln GT, 2014)



Source: IHS Fairplay + DNV-GL (2015).

The largest flags in the world are Panama (236 mln GT), Liberia (140 mln GT) and the Marshall Islands (112 mln GT). There are three EEA countries in the top-10 of largest flag states (Malta, Cyprus and Greece). The top-10 represents jointly 51% of the entire world fleet.

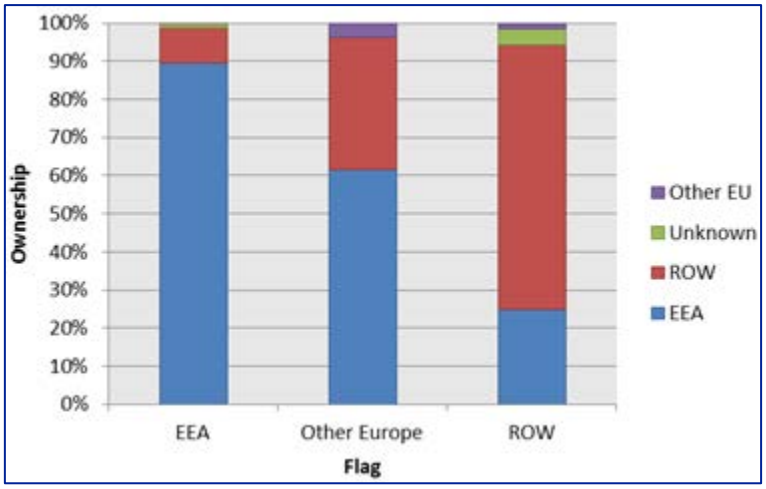
Figure 3.4 Top-10 flag states for the entire fleet (mln GT, 2014)



Source: IHS Fairplay + DNV-GL (2015).

When comparing EEA ownership and EEA flag, it is clear that a large part of EEA owned ships is operated under a non-EEA flag. In Figure 3.5, a division is made between EEA, other Europe, Rest of the World (ROW) and unknown. The figure shows that a large share of the EEA owned vessels also fly an EEA flag (not necessarily of the same country). EEA-based owners also often choose a flag from 'Other Europe', which includes flag states such as Gibraltar, Jersey, Guernsey and Monaco.

Figure 3.5 EEA ownership in relation to EEA flags (based on GT, 2014)

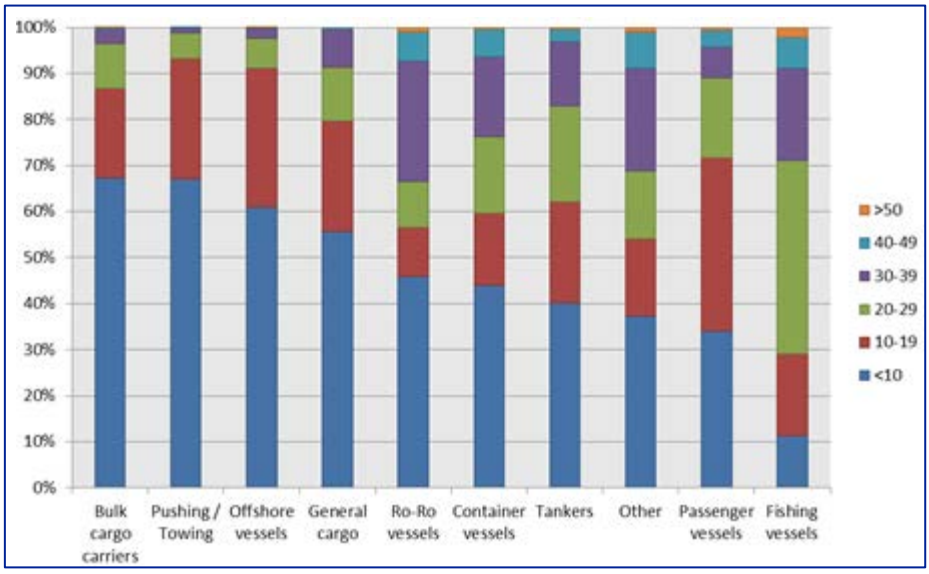


Source: IHS Fairplay + DNV-GL (2015).

Age of the world fleet

There are considerable variations in the average age per ship type, as Figure 3.6 shows. In total, almost 9,000 ships (16% of the world fleet above 500 GT) are older than 30 years, an age generally considered as fit for recycling. The age profile however differs considerably between ship types. The world bulk fleet, offshore vessels, container vessels and tankers are all relatively young, with more than 50% of the Gross Tonnage built from 2005 onwards. Fishing vessels are rather old, with less than 40% of the Gross Tonnage built in the last 20 years.

Figure 3.6 Share of vessels per age class (based on GT, 2014)

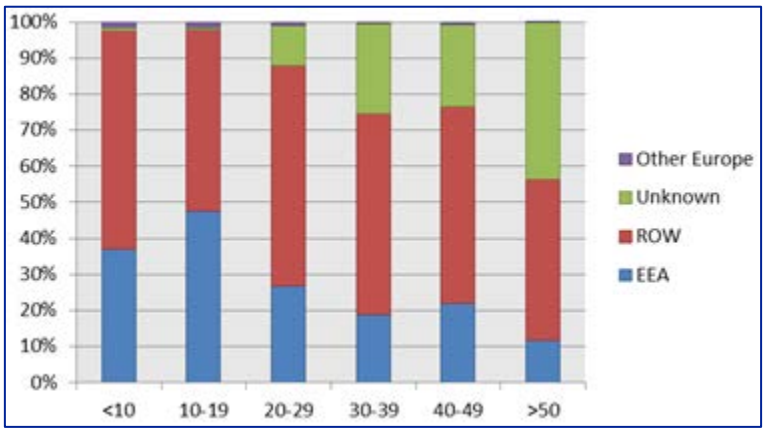


Source: IHS Fairplay + DNV-GL (2015).

Age and ownership

Contrary to what one may assume, the EEA-owned fleet is not young compared to the fleet of non-EEA countries, as Figure 3.7 shows. Of the ships aged less than 10 years, the EEA share measured in GT is a bit more than 30%. The EEA share declines with increasing ages.

Figure 3.7 Age of vessels by region of ownership (based on GT, 2014)

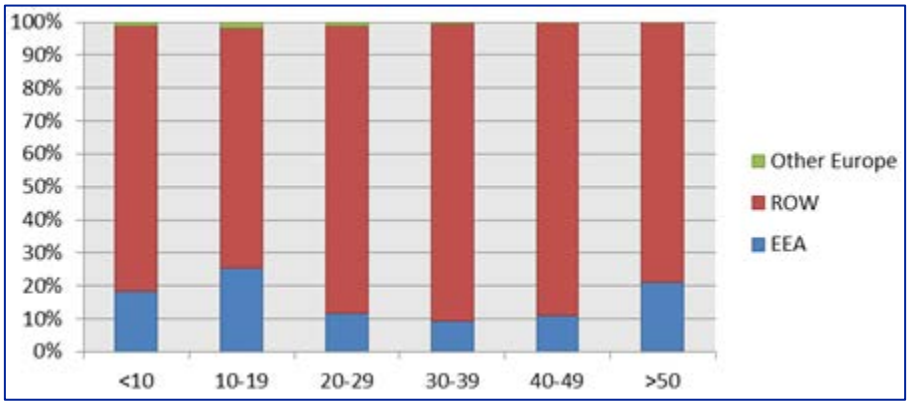


Source: IHS Fairplay + DNV-GL (2015).

Age and flag

When considering the flag of a ship in relation to its age, this picture looks different and there is no clear pattern of flag share over time.

Figure 3.8 Age of the vessels divided by flag region (based on GT, 2014)



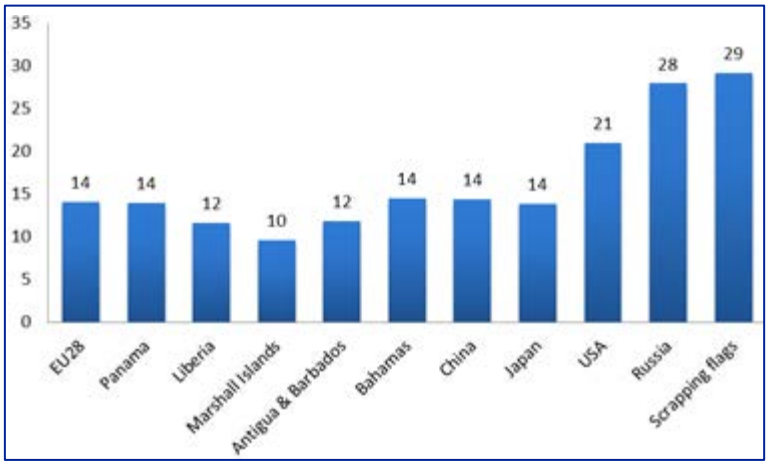
Source: IHS Fairplay + DNV-GL (2015).

Average age

The average age of the fleet, considering all vessels built from 1960 onwards, has been calculated for the main flag states. The average age of the fleet flying the EU-28 flag, measured in GT, is 14 years. The average age of other major flags ranges from 10 years for the Marshall Islands to up to 14 years for Panama and the Bahamas. Other flags with a relatively young fleet are China and Japan. This could be explained by the fact that these states started developing their fleet more recently than European countries.

Flags with relatively old fleets are the USA and Russia, with averages of 21 and 28 years respectively. Also the most popular end-of-life flags[30] (Comoros, Sierra Leone, St Kitts & Nevis, Tanzania, Tuvalu and Togo) show a relatively high fleet age, at 29 years.

Figure 3.9 Average age for major flags (number of ships, 2014)



Source: IHS Fairplay + DNV-GL (2015).

Evolution of the fleet over time

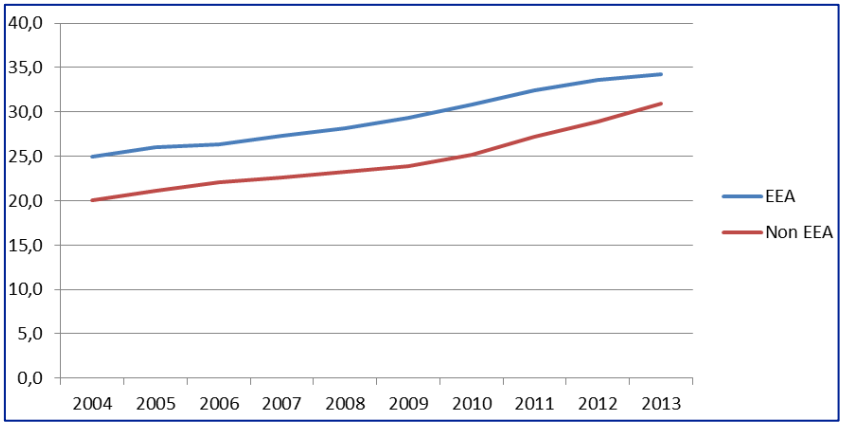
The characteristics of the maritime market have changed during the last decades. One of the trends identified is the increase in ship size. Figure 3.10 presents this trend based on data for the entire world fleet over a 10 year period. No distinction between

30 NGO Shipbreaking platform (2015), What a difference a flag makes.

ship types was made, but calculations were done separately for EEA flagged and non-EEA flagged ships. For both groups the average deadweight (DWT, a measure of the ship's size) per ship was calculated. The graph shows that the average size of EEA flagged vessels is larger than that of non-EEA flagged ships, and for both categories, a gradual size increase can be observed.

Based on this trend as well as other market signals (i.e. new-build orders) it is safe to assume that the size will continue to increase gradually. However, this trend may not continue forever, as vessel size is also restricted by the capacity of ports and sea straits that have a maximum depth and width. A convergence between the sizes of EEA and non-EEA flags also appears from the graph.

Figure 3.10 Development of average ship size in DWT (*1000) over time



Source: ISL shipping data (2004-2013).

3.3. Baseline: Port calls in the EU

We analysed port calls by ship type and size category, using port call data for 2014. For the analysis, 7 size classes have been defined.

Table 3.1 Size classes of ships applied (dwt ranges)

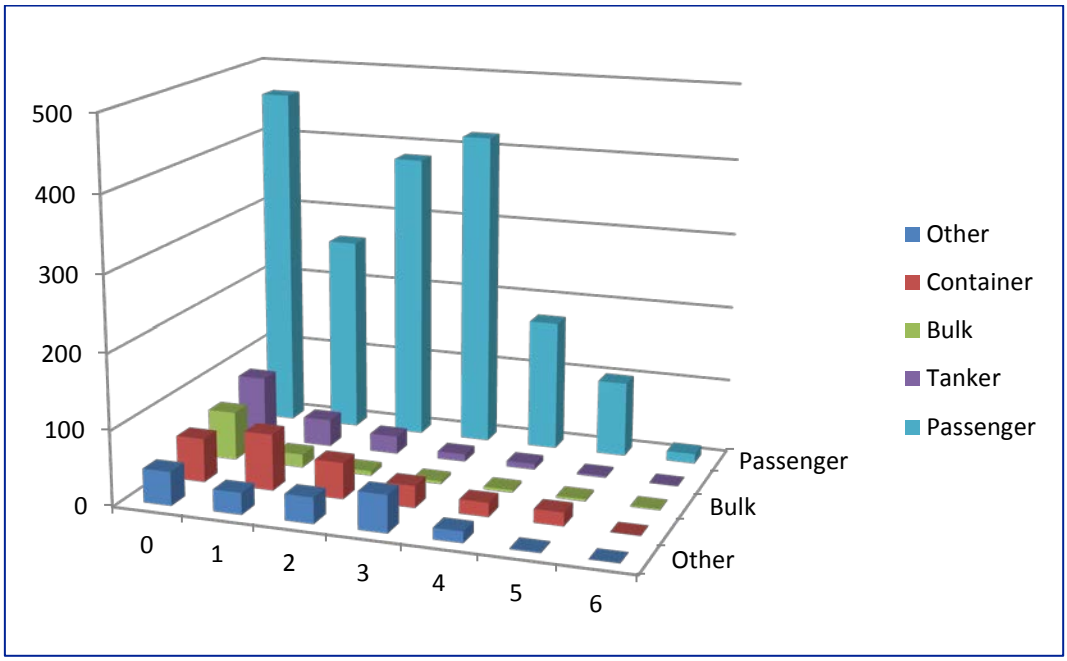
Size class	Size from	To
0	500	5.000
1	5.000	10.000
2	10.000	20.000
3	20.000	50.000
4	50.000	100.000
5	100.000	200.000
6	200.000	>

It is clear from the data below that passenger ships make the most frequent calls at EU ports, in particular the small and medium sized ships (size categories 0 up to 3).

Typically these categories include ferries operating frequent services between EU ports.

Among bulk, tanker and container ships, also the smaller ships (size category 0 and 1) make the highest number of calls (between 6 to 36 calls per year). Bigger ships of all types have significantly lower numbers of average port calls, although there are variations within each category.

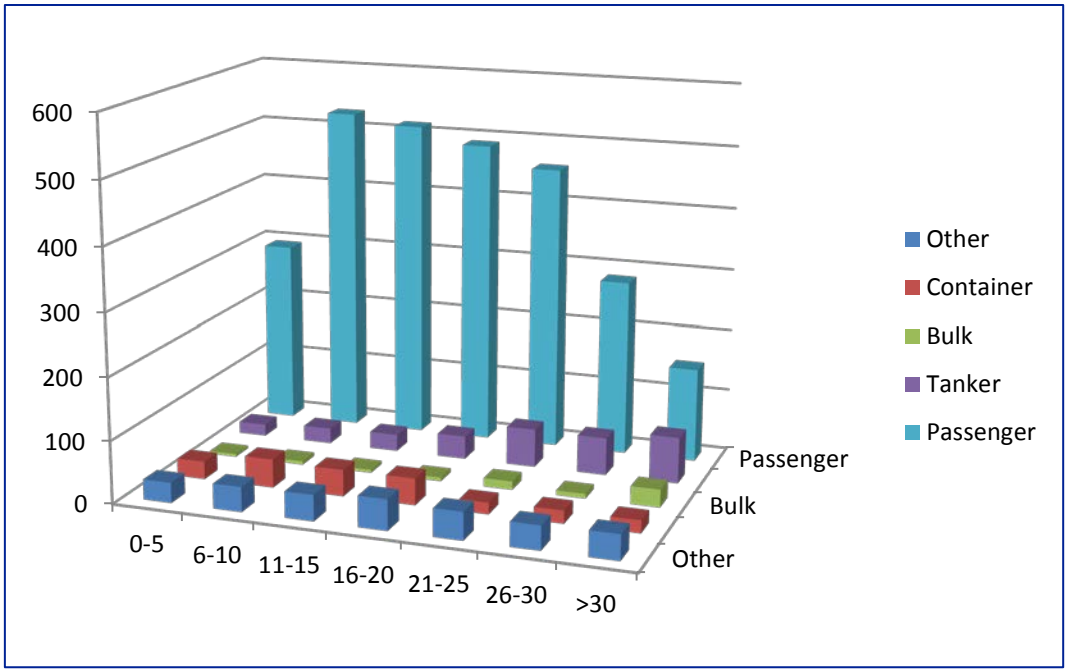
Figure 3.11 Average number of EU port calls per ship type and size category (data for 2014)



Source: DNV-GL, 2015, AIS data (2014 data).

The call frequencies appear to also vary according to the age of the ships, although not as much in every segment and not according to the same pattern. For passenger ships, frequencies are the highest for the age groups between 6-25 years, with frequencies in the range of 450/500 calls per year. For other vessel types, frequencies are lower throughout their lifetime. Remarkably for tankers, it is mainly the older ships of over 20 years that have the highest frequencies of EU port calls. This is also seen for bulk ships, to a lesser extent. For container ships, the opposite is true:, it is mainly the younger ships of up to 20 years that call at EU ports with higher frequencies of on average 43-46 times per year, declining as they age. The category of other ships, including a variety of ship types, shows a stable pattern across age categories.

Figure 3.12 Average number of annual EU port calls per ship type and age category (data for 2014)



Source: DNV-GL, 2015, AIS data (2014 data).

3.4. Baseline: supply of ships for recycling

In 2014, more than 1,000 ships were sold for recycling, of which bulk cargo vessels made up the largest group, with a total of 287 vessels, followed by general cargo vessels (242), container vessels (187) and tankers (161). Most vessels, 155 in total, sailed under Panamanian flag, followed by the flags of St Kitts & Nevis (66) and Liberia (45).

Measured in dead weight tonnage, these 1,000 ships accounted for more than 34,000,000 DWT. The largest ship types measured in tonnage were bulk cargo vessels (13,062,000 DWT) and tankers (8,420,000).

As indicated in table 1.2 European beneficial owners[31] sold, in 2014, 182 vessels for recycling purposes to South Asian yards (India, Bangladesh and Pakistan). They accounted for approximately 40% of all vessels scrapped at yards located in these countries. Greece was the state with the largest share of ships sold for recycling (70 vessels), followed by Germany (41 vessels) and Cyprus (11 vessels). Although these vessels had a European owner, they often did not sail under a European flag. Most popular flags for end-of-life vessels in 2014 were Panama (31 vessels), Liberia (29 vessels) and St. Kitts-Nevis (20 vessels).

31 *IHS Fairplay defines beneficial ownership as follows: (…) the parent company of the Registered Owner, or the Disponent Owner if the ship is owned by a bank. It is the controlling interest behind its fleet and the ultimate beneficiary from the ownership. http://www.ihsfairplay.com/About/Definitions/definitions.html.*

Table 3.2 Common European states of (beneficial) ownership and most popular last flags for ship recycling for ships broken at South Asian beaches (2014)

State of ownership	Number of vessels	Flag state	Number of vessels
Greece	70	Panama	31
Germany	41	Liberia	29
Cyprus	11	St. Kitts-Nevis	20
Italy	8	Malta	16
UK	6	Comoros	13

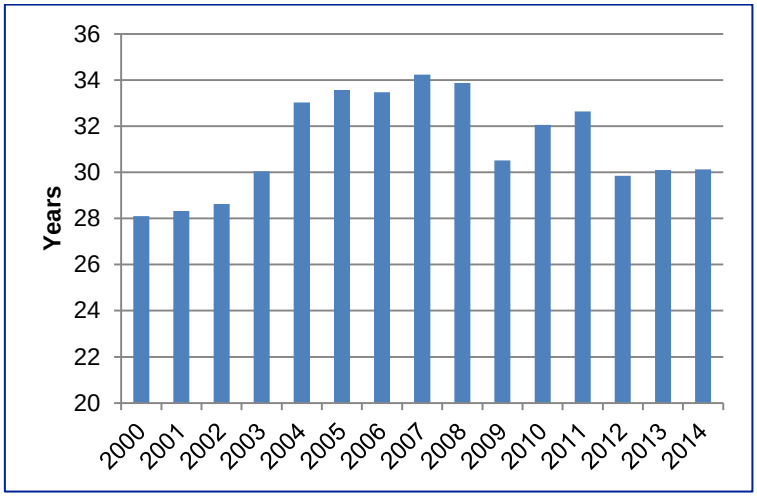
Source: NGO Shipbreaking Platform annual report 2015.

Supply of ships for scrapping is primarily determined by a number of economic factors, including the overall economic climate and resulting freight rates, but also steel price developments. In addition, a number of specific impacts might influence the number of ships that are coming on the market for scrapping and recycling which might affect a specific market segment. Clear examples are/were:

- The recycling of large single hull tankers; it is no longer allowed to buy single hull tankers as the risk of oil spills is much larger than for double-hull tankers. Single hull tankers are no longer allowed to entire most ports. As they are being phased out and as there is no new usage for these single hull tankers, they are being recycled even if they are not at the end of their technical life-span;
- Medium-sized container vessels: in the container market, ships are getting bigger and bigger. These newer and larger vessels are able to carry the same amount of TEU as several medium-sized container ships combined. Some container vessels might be used in a feeder network; however a large group will become redundant. The redundant vessels are likely to be recycled, which increases the number of vessels recycled per year;
- Large newly constructed bulk carriers: before the economic crisis of 2008, many new bulk cargo carriers were ordered at shipyards. Due to the crisis, the demand for additional vessels has decreased. However, the vessels are still being built. To reduce the current vessel fleet, many bulk carriers are laid up, which is costly. Some ship owners decide to recycle their vessels as the new steel etc. might have value.

The average age of ships offered for recycling in 2014 was 30 years. During shipping boom years (2004-2008), ships were kept in use longer and the averages ranged 33.0 to 34.2 years, compared to shorter lifetimes of 28.1 to 30.0 years between 2000 and 2003 and 29.9 to 32.6 years between 2009 and 2014.

Figure 3.13 Average age of recycled vessels, 2000- 2014 period (in years)



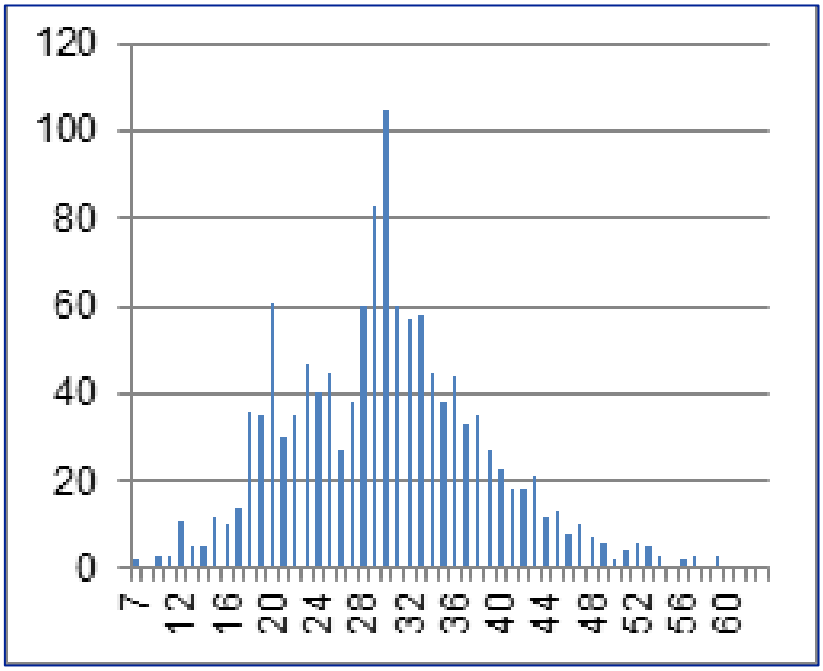
Source: IHS Fairplay + DNV-GL (2015).

Recycling ages also vary between ship types and between recycling regions.

Spread of recycling ages

While the average recycling age in 2014 was 30 years, there is a significant spread around this average, with about 20% of ships recycled before they reach the age of 20 years, but also ships kept in service far beyond 40 years.

Figure 3.14 Distribution of recycling age (number of ships per year, 2014 recycling data)

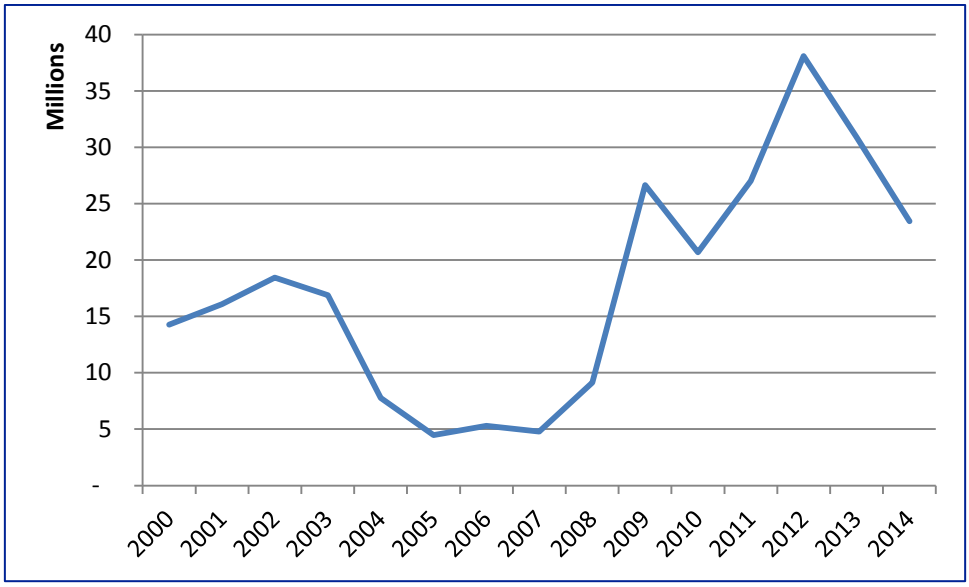


Source: IHS Fairplay + DNV-GL (2015).

Volume offered for recycling

The variation of shipping market conditions is also observed in the volumes offered for recycling by year. The total volume of scrapped vessels was relatively low between 2004 and 2008. While the volume reached about 14.3 million to 18.4 million Gt between 2000 and 2003, it reached only 4.5 to 9.1 million Gt between 2004 and 2008. Between 2009 and 2014, higher volumes were reached again. After a peak volume of 38.1 million Gt in 2012, the volume decreased to 23.4 million in 2014, but still remained higher than the 2004-2008 levels.

Figure 3.15 Volume (in Gt) of scrapped vessels over time (2000-2014)



Source: IHS Fairplay + DNV-GL (2015).

3.5. Baseline: the costs of sound ship recycling

Price differences between environmentally sound recycling according to the SRR and recent common practices of scrapping

When a ship owner decides to offer a certain ship for recycling, his main objective is generally to receive the best price for the ship. This goal is independent from whether the ship will be sold directly to a recycling facility and delivered by the ship owner to the recycling facility or whether it is sold to a broker or cash buyer with the official intention to scrap the ship.

The basic understanding of ship recycling, from which the need for a financial incentive is derived, is the following:

Table 3.3 Simplified comparison of sound vs non-sound recycling (figures for explanation purposes only *)

Cost / revenue item	Non-sound recycling facility	Sound recycling facility
Residual value of the ship	90	100
Minus profit yard	10	10
Minus ship breaking costs	10	20

Cost / revenue item	Non-sound recycling facility	Sound recycling facility
Minus extra costs of sound recycling process + sound treatment of wastes	-	30
Net revenue ship owner	70	40

** See figure 1.3 in Ch.1 for a more elaborate presentation of recycling revenue and cost components.*

1. Every yard will aim for some profit margin; if too high, they would be priced out of the market. The profit margin may however be volatile over time depending on demand & supply balances;
2. Ship breaking costs are likely to be higher in SRR-approved yards than in substandard yards;
3. Recycling in a sound way will bring extra costs to the recycling yard as it has to invest in e.g. better quality facilities and working conditions;
4. As a result, the net revenue that remains for the ship owner differs between the two options. The gap identified would be the basis for a financial instrument. Ideally, this gap is overcome so that the instrument takes away the financial disincentive of non-sound recycling.

Recent example of recycling costs on a Turkish recycling yard

A major problem in assessing the additional costs for a recycling facility to provide sound recycling is that reliable recent data is not publicly available. Active ship recycling facilities are generally not willing to give a detailed view on their recent condition of the recycling process and may need investments for an environmentally sound recycling with regard to the SRR or HKC requirements.

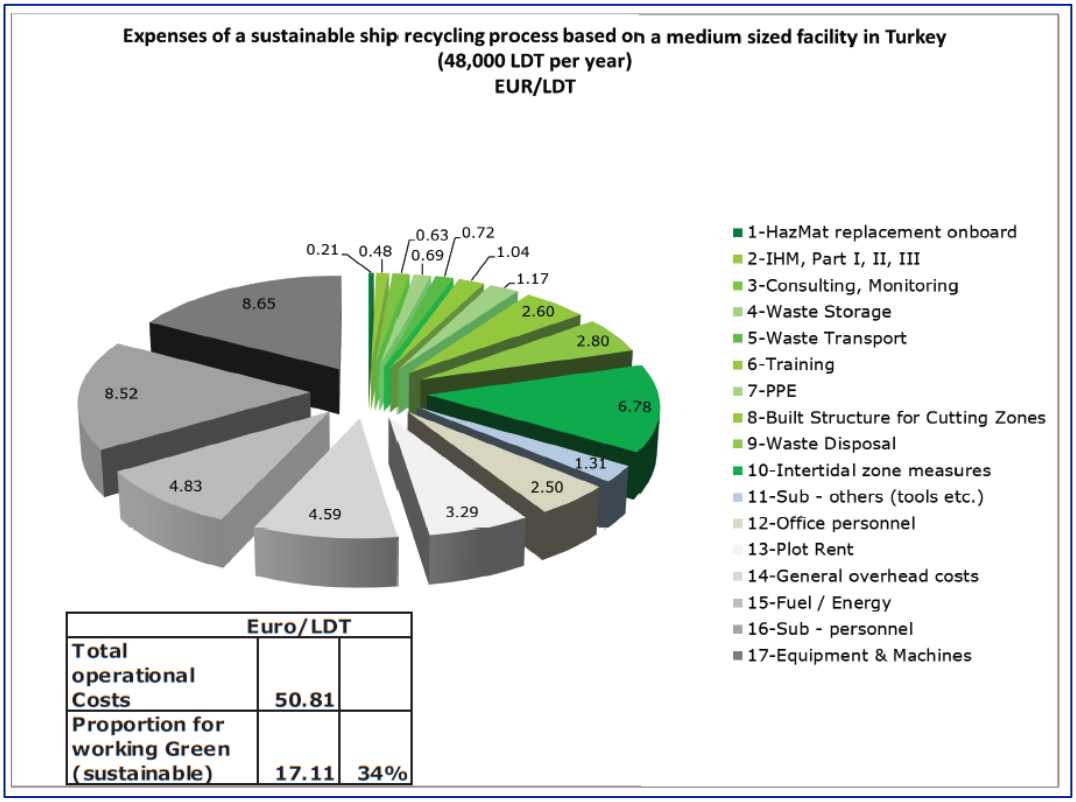
Based on recent work of DNV GL for the Turkish Government (Undersecretariat for Maritime Affairs) and for several recycling facilities in that country, it was possible to make a complete evaluation of one of these scrapping yards including a detailed evaluation of further investments needed to improve this enterprise to the levels of operation of SRR and HKC.

An evaluation of DNV GL together with a medium sized ship recycling yard in Turkey gives a good overview of the additional costs (= foregone revenue) of an environmentally sound recycling process. The yard concerned has been active in the area of recycling for quite some time and has a capacity of about 50.000 lightship tonnes (ldt) per annum, i.e. an average yard in Turkey.

The evaluation considered investments in the yard which are needed to fulfil the requirements set out in articles 13 and 15 of the SRR. The different cost titles and their values can be found in Figure 3. and explanations in Table 3. below. Investments have been depreciated between 5 years to 20-25 years (floating dock, pontoon, building structures, etc.) within the calculation. Capital cost based on 6% interest rate has been considered.

The analysis gives an additional cost for recycling in accordance with the SRR of about 34%, or about €17 per ldt additionally. This evaluation does not yet consider impacts for different ship types and –sizes, but it covers all items to be considered for environmentally sound recycling. It is noted that the costs given here (and used in the rest of the study) assume an already largely compliant downstream waste management infrastructure. For yards that will need major investments to comply, either at the yard itself or at waste handling facilities outside the yard, these costs would obviously be higher.

Figure 3.16 Expenses of a sustainable ship recycling process



Source: DNVGL 2015.

Table 3.4 Explanation of recycling cost titles

	Cost titles	Costs (€/ldt)	Notes
1	HazMat replacement onboard	0.21	Team of specialists of 10 persons will remove and clean Hazardous Materials before starting the scrapping process, 2 weeks per ship (operational cost only, no further investments required)
2	IHM, Part I, II, III *	0.48	Preparation of IHM Part I, II, II by HazMat Expert and respective Certification for two ships. This cost package could become lower in case of ALL ships do have a "ready for recycling" – certification. (operational cost only, no further investments required)
3	Consulting, Monitoring **	0.63	Case by case consultancy plus continuous monitoring programme for soil, air and water protection. 2

	Cost titles	Costs (€/ldt)	Notes
			reports per year. (operational cost only, no further investments required)
4	Waste Storage	0.69	200 sqm storage building, roofed and special sealed floor plus drainage. Intended for storage of asbestos/6tons, bilge water/50t, sludge/12t, waste oil/214t & further dangerous solid waste/55 m^3 (Investment of capital, depreciation of 20 years)
5	Waste Transport	0.72	All wastes are transported to waste management facility, distance 1 hour drive (operational cost only, no further investments required)
6	Training	1.04	4 one day trainings related to safety and work processes on site. (operational cost only, no further investments required)
7	PPE	1.17	All workers use PPE according to DNV GL standard (considered as operational cost as this is expendable material related to endurance)
8	Build structure for Cutting Zones	2.60	10.000 sqm concrete floor incl. Drainage and collection and disposal of 5000 cbm waste water, office building. (Investment of capital, depreciation of 20/25 years)
9	Waste disposal ***	2.80	Amounts of wastes are calculated based on average volumes for 10 year old vessels, based on DNV GL experience & internal data. (operational cost only, no further

	Cost titles	Costs (€/ldt)	Notes
			investments required)
10	Intertidal zone measures	6.78	Additional beams, oil collection facility (oil & sludge collection boat) and Pontoon/floating dock with cranes for bottom part dismantling is calculated. (Investment of capital, depreciation of 25 years, for the beams 5 years)
11	Sub - others (tools etc.)	1.31	Licence fee, Fencing, membership association
12	Office personal	2.50	10 admin staff for proper management of the site
13	Plot Rent	3.29	The plot rental is based on local actual costs
14	General overhead costs	4.59	10% admin overhead is calculated
15	Fuel / Energy	4.83	Fuel for the machinery based on a fuel price of 1.50 Euro/Litre
16	Sub – personnel	8.52	Subs are used to do the cutting, the service includes wages, gas for cutting, torches, lunch
17	Equipment & Machines	8.65	2 excavators, windlass and wheel-loaders are supplied for the daily work
	Subtotal (green)	17.12	
	Total (all cost items)	50.81	

** To line (2): IHM is a basis for any sustainable ship recycling on site. Assuming some vessels will not have a proper IHM it has to be established first before the recycling process can be started.*

*** To line (3): This cost group considered refers to Article 13 (d). For recycling facilities it is international standard to have a soil, water, air monitoring in place at least 2x per year samples will be taken and the impact of the facility on the direct neighbourhood environment will be checked and recorded.*

**** To line (9): Hazardous waste is disposed at authorised waste recycling facilities only. Evaluation of DNV GL found that the waste receiving facilities operate in accordance with human health and environmental protection standards that are broadly equivalent to relevant international and Union standards. A detailed cost evaluation is available.*

Impact of ship size & type

Independent from ship size and type (with some exemptions like cruise ships, special vessels and small ships below 500GT for instance), most of a ship's value comes from its steel. Between 85 and 65% of a ships' light weight is steel. This material is the main revenue for recycling facilities, from which the purchase price and own expenses for recycling (Opex and Capex) need to be covered. From a seller's perspective, LDT is in fact the dominating value for a ship's sale price in the global recycling markets. Two of the world's largest cash-buyers, GMS and Wirana, differentiate offers between general cargo & wet tankers only. The recent price differences between these two categories are only about +/- 10%. From this perspective it is considered reasonable to take €/LTD as the basic unit for setting a financial instrument for sound recycling.

However, in the future, ships may also have more, and more complex, technologies on board as a result of regulations (e.g. ballast water treatment & exhaust gas cleaning systems). This trend may contribute to an increase of the costs of sound recycling. Still, as for other valuable supplies and installations on board, it depends on the ability of the recycler as well as the (local) resale market whether this equipment can be seen as an additional asset in reselling recycled materials and supplies.

Impact of facility capacity per year

To obtain a unit cost in terms of "€/LDT recycled" for calculating the required funding for a ship to be scrapped/recycled in a sound manner, the evaluated amount of expenditures of a facility for environmental sound recycling must be divided by its annual maximum scrapping capacity. This number should ideally be independent from the actual volume of scrapped ships but should consider its capacity when applying for the European yard list according to the SRR.

The recycling capacity per year is defined in the Regulation itself and further clarified in the official template for applications to the European List:

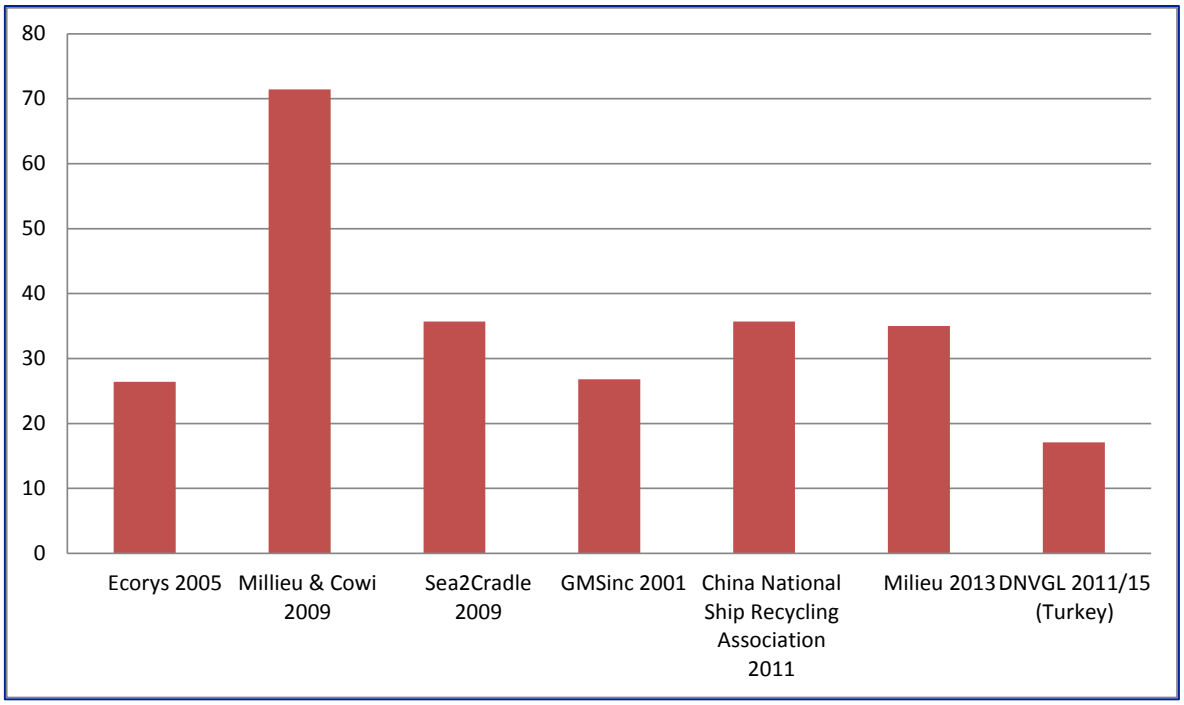
> *Maximum ship recycling output achieved on a given year in the past 10 years (in LDT):*
>
> *The figure should be documented, e.g. via official confirmations of completion of recycling of ships recycled that year, indicating LDT of the ships. As per Article 32 of the EU SRR, the figure is calculated as 'the sum of the weight of ships expressed in LDT that have been recycled in a given year in that facility. The maximum annual ship recycling output is determined by selecting the highest value occurring in the preceding 10-year period for each ship recycling facility, or, in the case of a newly authorised ship recycling facility, the highest annual value achieved at that facility'.*

With this information about the recycling capacity of a facility per year in LDT, the investments and additional costs for environmental sound recycling can be converted into additional cost per LDT recycled.

Data on recycling costs from other sources

When we compare the previous estimates for the marginal cost of environmentally sound ship recycling, compiled by the previous studies we can see an overall trend of decreasing costs. The figure below also shows that all sources (except the Milieu & Cowi 2009 study) are in the range of €20-40 per LDT, including the estimate presented above (and again here under DNVGL 2015).

Figure 3.17 Estimates of marginal cost of sound ship recycling (in EUR per LDT)



Sources: see in graph; USD data converted using 2011 exchange rate.

The Milieu 2013 study[32], which is the most recent other source, uses data from China about an "offset" for environmental recycling. The assessment was done on the basis of stakeholder consultation and assumptions. The shown value of 35 €/LDT is a medium offset. The lower offset is mentioned with about 20€/LDT and the high offset with 50€/LDT for environmental sound recycling. A possible worst case is given with 75 €/LDT. The large difference of additional cost for environmental recycling between lower offset and worst case of 55€/LDT shows the uncertainty of this evaluation.

The Milieu & Cowi 2009 study shows the highest value for cost of green recycling based on data from Chinese stakeholders. They mention a value of 100 €/LDT as a "central estimate" with a low estimate of 25 €/LDT and a high estimate of 150 €/LDT.

All studies mention that the additional cost for environmentally sound recycling has a high volatility due to lack of individual investigation with reliable numbers.

Finally, it is noted that while the above assessment is presenting the revenue gap based on calculations in EURO, recycling facilities outside of the EURO-zone may incur costs in other currencies, which implies their cost gap may be affected by volatile exchange rates. As an example, the exchange rate between the Euro and the Turkish Lira deteriorated between 2011 and 2015 (2.45 €/TRL in 2011 compared to about € 3,20/TRL at the end of 2015).[33] Since the financial instrument will be used to build up capital over a longer period of time (20 years or more), such variations may need to be accounted for by foreseeing some margin in the annual fees to be paid.

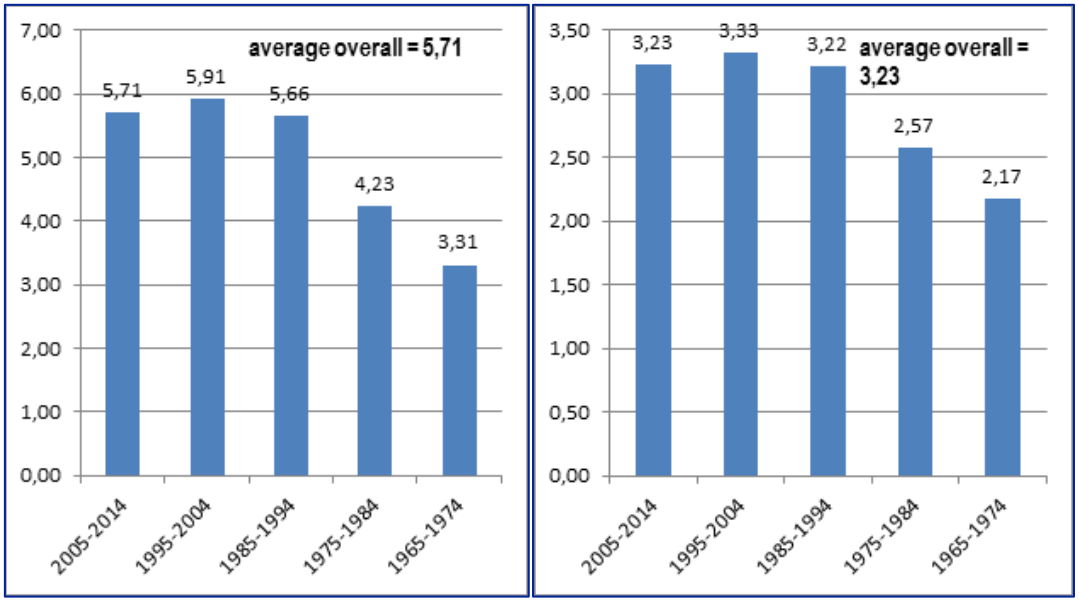
32" Financing the environmentally sound recycling and treatment of ships"2013, Impact Assessment Unit, Directorate for Impact Assessment and European Added Value.

33 Source: Oanda Corporation.2015, online, historic exchange rates.

Converting from DWT or GT to LDT

The costs of recycling are thus expressed in costs per LDT (light weight of the ship), whereas vessels are usually registered on the basis of their deadweight (DWT) or Gross Tonnage (GT). Hence a conversion needs to be made. In the Commission's Impact Assessment (2012), average GT/LDT conversion factors were calculated for a variety of ship types. More recent fleet data from DNVGL indicate higher average conversion factors, i.e. for bulkers in the range of 3.23 GT/LDT versus 2.6 in the Commission's report. It should also be noted that the conversion factors appear to evolve over time with lower values for older ships.

Figure 3.18 Conversion ratio of DWT/LDT (left) and GT/LDT (right) for bulk vessels by age class



Source: DNVGL & Clarksons Research.

4. ASSESSMENT OF IMPACTS

As indicated in chapter 2, the most feasible option to be considered in the assessment of the impacts is the Ship Recycling Licence. In general, apart from the feasibility of the instruments, impacts of the different financial instruments will be comparable, as all instruments need to be able to accumulate sufficient revenue to bridge the revenue gap between sub-standard and safe and sound ship recycling practices. Differences do exist but these relate mainly to the design and implementation of the instruments, although to some extent minor differences might also exist between private and public instruments[34].

To assess the impacts of the financial instrument, a dedicated model has been designed which allows for an assessment of the funds required for safe and sound recycling, the resulting impact on premiums/licence costs, resulting recycling behaviour of ship owners and the development of the size of the fund over time. This model is presented in section 4.1. Subsequently, in section 4.2 the economic, social and environmental impacts are assessed, building upon the results of the financial model.

4.1. Description of the quantitative model

A number of key assumptions are built into the model. The model and the underlying assumptions are further explained below.

In order to analyse the feasibility of the proposed options, three aspects have to be modelled:

- Price of licence – this is the only variable which is free to determine and which drives the model throughout. In order to achieve the required aims, the following design condition was set:
  Any new ship (of any type and in any size class), with a typical frequency of EU port calls (in its ship type and size class) to be able to accumulate enough funds over a 20 year period to cover the revenue gap of sound versus unsound recycling.

  While the average age of a ship amounts to approximately 30 years (varying over time between 28 and 34 years as a result of scrapping decisions following shipping market conditions), the distribution of recycling age shows that a remarkable share of ships are recycled at earlier ages. Therefore for the analysis, a 20 year period for accumulating capital has been chosen to ensure that a sufficiently large share of the fleet is able to accumulate the required amount. Furthermore, it is assumed that payments (licence fees) are paid over a period of only 15 years, after which the capital continues to grow through returns on capital. This duration can be set otherwise and will therefore be considered as part of sensitivity analysis.

- Individual ship decision – by using principles of optimisation theory, the modelling determines the rational[35] behaviour of ship owners for each ship for each year of operation and therefore its financial accumulation over its lifetime[36]. Thus, the model estimates the likelihood of an individual ship being sent for sound recycling as a result of the financial product[37]. Such detailed information per individual ship

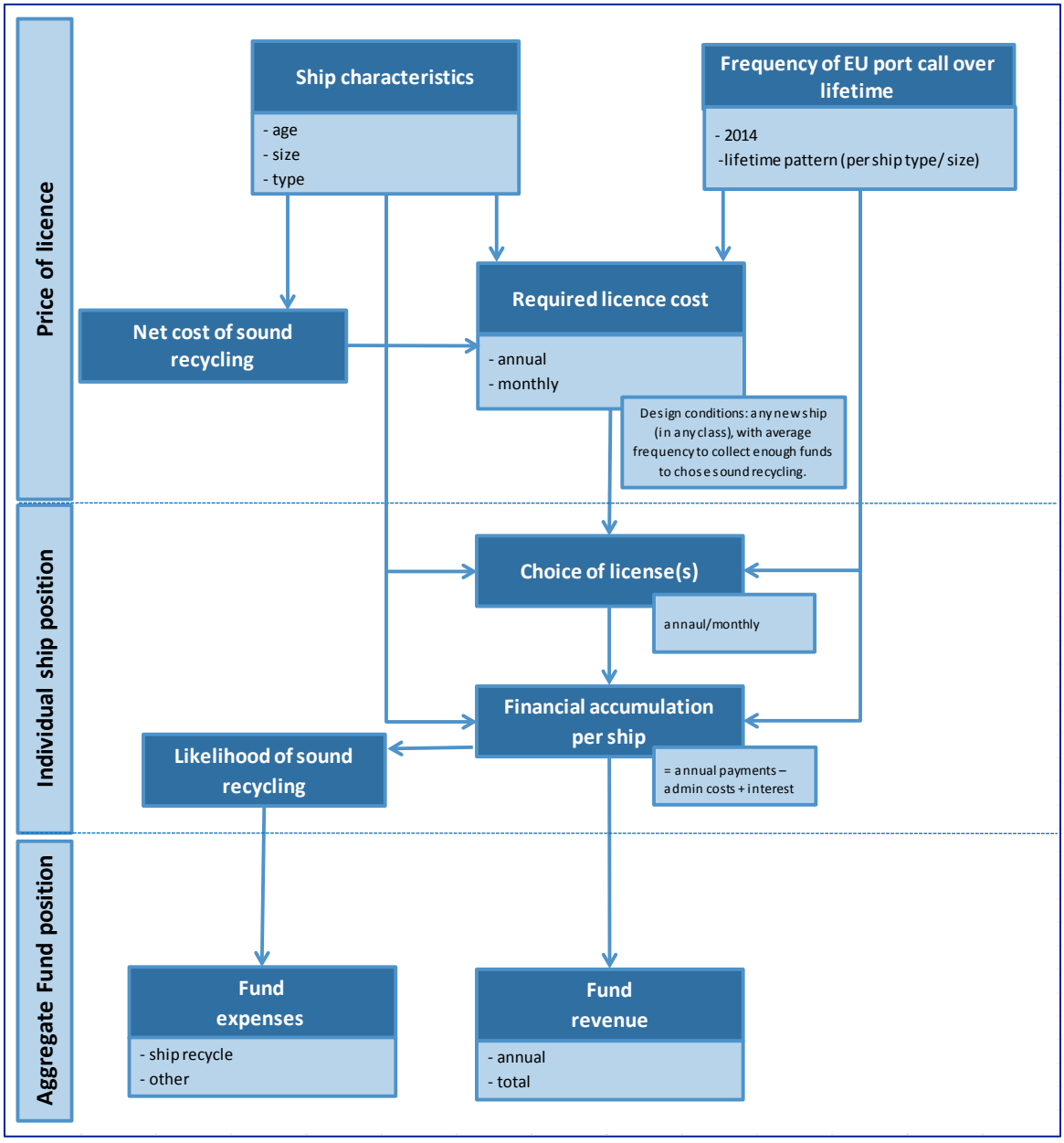
34 *For example in the efficiency of management of the instrument and the return on accumulated capital.*
35 *A key assumption was that each ship was only trying to minimize costs, while keeping its habits (ie EU port calls) constant. In later models it will be possible to relax such an assumption, but for the time being this is a key criteria.*
36 *Paying attention to different sizes, types, age of ship and frequency of call to EU ports.*
37 *Here the assumption is that ship owners will opt for sound recycling if the amount accumulated exceeds 60% of the net cost of sound recycling. Such assumptions can be further refined and the sensitivity of other assumptions tested.*

can then be extrapolated to make conclusions about ship size classes, ship age groups etc.;

- Aggregate fund position – with information about the annual behaviour for ships (i.e. the choice for a yearly or monthly licence), the model also considers the cash-flow implications for the fund, taking into account both revenue streams (from licence payments) and cash expenses (when ships are recycled in a sound way and funds are withdrawn).

The figure below provides an illustration of the different modelling steps in the overall model. Each step is described in more detail hereafter.

Figure 4.1 Visualisation of the quantitative model



Price of licence calculation

Ship characteristics

The data used is taken directly from IMO and includes all the publicly available information on each ship (based on the ship's IMO number). This allows each ship to be categorised according to its:

- size class (the following size classes have been used);

Min size (dwt)	Max size (dwt)	Size Category
500	5,000	0
5,000	10,000	1
10,000	20,000	2
20,000	50,000	3
50,000	100,000	4
100,000	200,000	5
>200,000		6

- ship type (based on the available information, ships have been grouped into five main categories);

Ship type category	
Bulk	Bulk Dry
	Bulk Dry / Oil
	Other Bulk Dry
	Self Discharging Bulk Dry
Tanker	Chemical
	Liquefied Gas
	Oil
	Other Liquids
	Other tanker
Container	Container
	Refrigerated Cargo
Passenger	Passenger (ferry, cruise ship)

Ship type category	
	Passenger / General Cargo
	Passenger/RoRo cargo (ferry)
Other	Barge
	Dredging
	Dry Cargo/Passenger
	Fish Catching
	General Cargo
	Non-ship structures
	Offshore Supply
	Other Activities
	Other Dry Cargo
	Other Fishing
	Other Non-Seagoing
	Other Offshore
	Research
	Ro-Ro Cargo
	Towing / Pushing
	Yacht

- ship age (the following age cohorts have been used).

Age Category	Year of build range
0	2005-2014
1	1995-2004
2	1985-1994
3	1975-1984
4	1965-1974
5	...-1964

Frequency of EU port calls over lifetime

The number of EU port calls over the course of 2014 is available for each individual ship from DNV/GL databases. This information is key in later stages to determine the ship owners' behaviour depending on their ships' individual frequencies of EU port calls.

However, the number of EU port calls may vary over the lifetime of a ship and for different ship categories. To calculate this, a non-linear regression is used to determine the typical development of port calls by age group of each size and type category of ships. This information is then used to estimate the typical port call pattern of a ship over 30 years, in each size and type category, in terms of EU port calls per year during its operational life.

In other words, the model calculates the “typical” behaviour in terms of EU port calls for a new ship in its size and type over the ship's lifetime and how its EU port calls are likely to develop.

Net cost of sound recycling

To structure a financial product, it is imperative that the revenue gap of safe and sound recycling vis-à-vis substandard recycling is known.

To calculate this, the technical experts from DNV-GL considered the following:

- Assessment of the additional cost (per LDT) of safe and sound recycling based on a detailed analysis of the cost-based structure of a typical shipyard assumed to be compliant compared to a non-compliant shipyard[38]. This data is complemented with information from the FP research project DIVEST as well as other information available within DNVGL (see section 3.5 for an elaboration of this analysis);
- Conversion of IMO information on ship size in DWT to LDT, using world fleet data also available from DNVGL (see again section 3.5).

By combining these two sources of information, it is possible to calculate the additional cost for safe and sound recycling (in € per LDT) for ships of different size classes and types. In other words, the funds required to overcome to revenue gap stemming from safe and sound recycling.

Required licence cost

The information gathered allows for the optimised calculation of the necessary licence cost fees to satisfy the following design condition:

> *A new ship (in any size class and in at least one ship type category), with a typical frequency of EU port calls (in its size class) to be able to collect enough funds over a period of 20 years to cover its revenue gap of safe and sound recycling.*

The design of the financial instrument allows for ships visiting EU ports less frequently to choose a cheaper monthly licence. This licence was designed with the following condition:

> *To allow flexibility of choice, while incentivising ship owners to opt for the annual licence if visiting EU ports on a regular basis (≥7 monthly licences).*

38 With the exception of downstream waste management, expected to be largely compliant in both cases.

Finally, to complete the cost of the licence, a surcharge needs to be added to compensate the administrative costs of issuing the licence, plus the (net) return on capital accumulated in the fund. The following two key figures have been taken from the literature and other existing public funds:

- Administrative costs of annual licence= 0.5%[39];
- Administrative costs for a monthly licence = 5%[40];
- Return on capital (the interest gathered by the ship's fund) = 1.5%[41].

Obviously, each of these assumptions has a level of uncertainty, and the impacts of other assumptions will therefore be investigated through sensitivity tests.

Individual ship position

Choice of licence

Each ship is assumed to make a choice regarding which licence to buy based on a cost minimising principle, therefore always opting for the cheapest option. The choice of licence is modelled on a yearly basis for each ship, based on its individual EU port call frequency over the ship's lifecycle, as calculated earlier. Therefore, as the frequency of EU port calls may change over the lifecycle of a ship, it might be that a switch will be made between the different types of licence at some point.

Financial accumulation per ship

By combining the information of the ship's choice of licence on an annual basis over its lifecycle and the cost of the licence for the ship's size category, the model calculates the financial accumulation of funds over the ship's lifetime. The equation that is calculated for each ship over the lifetime of the ship can be written in its most basic form as:

$$financial\ accumulation_{IMO} = \sum_{ship's\ end\ (\max 30 years)}^{2015} (annual\ licence(s)\ cost - admin\ costs) \times ROC$$

Where IMO = IMO number of the unique ship and ROC = Return on Capital.

39 *For the European Fund for Strategic Investments, the European Investment Bank introduced a European Investment Advisory Hub (EIAH). Its operations and administration capabilities are comparable to those envisaged here. The above figure represents their average administrative costs. Our own calculations on administrative costs (section 5.2) point to similar cost levels of around 0.8%.*

40 *We assume that the administrative effort for processing monthly licences will not significantly differ from that of yearly licences, which means that the relative cost increases by a factor 12. However users purchasing a monthly licence will not do so 12 times per year.*

41 *The example is taken from the Norwegian fund, which takes the revenue generated from oil taxes and invests in conservative positions in order to grow the size of the fund. Similar investment strategy is envisaged here.*

Likelihood of sound ship recycling

In order to quantify if the financial instrument will work and incentivise a ship owner, and indeed more aggregated categories, to recycle in a sound manner, it is assumed as a rule that ships which have built up at least 90% of the required funds for sound recycling will indeed be sent for sound recycling. This assumption is adjustable to assess the sensitivity of the outcome to this assumption. Hence the model builds on previous calculations[42] and combines them with a conditionality calculation. The basic form of the calculation can be presented as:

$$YES = financial\ accumulation_{IMO} > (net\ cost\ of\ sound\ recyling_{size} \times 90\%)$$
$$NO = financial\ accumulation_{IMO} < (net\ cost\ of\ sound\ recyling_{size} \times 90\%)$$

These results indicate the "success rate" level that the financial instrument could have[43] in encouraging safe and sound ship recycling.

The results will then be extrapolated to ship categories and other more aggregate levels in order to demonstrate the overall impacts and costs of the financial instrument.

Aggregate fund position

Lastly, to indicate the full operational nature of the proposed financial instrument, the model considers the fund as a whole. Given that the revenues from the collection of licences and the payments (expenses) when ships are recycled in a sound manner will not always be equal, it is important to calculate the cash-flow and financial position of the fund over the next 30 years[44].

Fund revenues

From the calculation of each ship's annual licence cost[45], the fund's revenue can simply be calculated as the sum of those contributions each year, and the return on capital realised.

Fund expenses

The fund's expenses will consist of administrative costs on an annual basis (financed from the gross licence fees paid from which a percentage is deducted as explained above) as well as the annual funds released for ships that have been recycled in a sound manner.

In practice, the model calculates the number of ships which are ready for recycling (those aged 30 years) each year under the condition that on an individual level they have accumulated enough financial capital to incentivise them to recycle in a sound manner (using the calculations from "the likelihood of sound ship recycling" above).

The model also incorporates the fact that ships that have not accumulated enough capital[46] will not make use of it as they are recycled at substandard facilities. This will create excess funds (in particular in the early stages of the fund), which can be used

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42 In reality the model in its complex form runs all these steps simultaneously, but here we explain the operations and logic behind the calculations.
43 Given its specifications and the nature of the modelling, which indicates estimates and levels of magnitude given the models specifications, rather than exact figures and forecasts.
44 The reference period set for the study.
45 A constant entrance of new ships was calculated in order to estimate the long term viability of the fund.
46 All ships which are not able to accumulate at least 90% of the required funds.

for other purposes related to the promotion of safe and sound recycling (e.g. the creation of a transition fund, training and education in safe and sound recycling, etc.).

Net fund position

By analysing the cash-flow of the fund, the model will also be used to calculate the net position (excess money, money reserves) of the fund over time. This indicates primarily whether the fund is financially self-sustainable and what could be the size of any potential extra funds available for other activities.

Summarising: the model outputs

The financial model delivers information on:

- The amount to be accumulated to cover the financial gap between sound and unsound recycling. This amount depends on ship size;
- The premium required under an annual savings regime (public fund) as well as the levels of premiums if connected to a licence on a monthly basis (an option considered for ships having low frequencies of calls at European ports), taking into account assumptions on capital accumulation;
- The resulting price of a licence (also taking into account assumptions on administrative costs).

Based on these data, calculations are made regarding the level of capital that each ship will accumulate over its (remaining) lifetime. As a result of this, a forecast of the level of gap coverage for each ship is available.

We assume that depending on this level, ship owners may or may not actually opt for sound recycling: if they have accumulated the full amount, they likely will; if they have hardly built up any capital, they will not; in between, a number of ships will probably still be sent for sound recycling – this number is likely to be higher for ships for which the accumulated capital is closer to the required amount (small remaining cost gap).

Hence, the model delivers an estimate of the share of the fleet opting for sound recycling, per year.

4.2. Impacts

In addition to the baseline development of the world fleet, the port calls pattern and the costs of sound recycling, assumptions are also made regarding the existence of sound recycling policies. In the original impact assessment for the SRR, it was assumed that the HKC would be in place by 2020[47]. In our analysis, however, we conservatively assume that the SRR is the baseline and that no other incentivising or regulatory policies will come into effect in the near future. This means that autonomous development of sound ship recycling, as observed over the past years, would be potentially further advanced through the entry into force of the SRR and the accreditation of sound ship recycling facilities in the years to come.

In the original Impact Assessment for the SRR, the baseline scenario (HKC only) assumes that while the volume of ships recycled at the highest rated yards (AAA and AA) gradually increases over time, it remains below 1% by 2030. Hence adopting the SRR only as a basic assumption under the baseline scenario does not lead to significantly higher volumes of vessels sent for sound recycling due to the possibility of circumvention.

47 *SWD(2012)47 final. Commission Staff Working Document : Impact assessment accompanying the proposal for a Regulation on shiprecycling.*

For the analysis of the financial instrument, we have therefore assumed the baseline scenario to be recycling in non-sound (non-accredited) facilities.

4.2.1. Economic impacts

Level of licence fees

Based on data available on the amount needed to cover safe and sound ship recycling practices (in other words, the revenue gap between sound and unsound recycling for a particular ship), the total necessary amount to accumulate per ship size category was calculated. In the financial model, this has been offset against the average EU port-call frequency of ships (per size, type and age), in order to establish the licence fee needed to reach the amount required. The licence fee is designed to reach the necessary amount in 20 years (a conservative estimate as the average age of vessels offered for scrapping has been closer to 30 years over the past 15 years), This roughly requires 15 years of contributions[48] (after which further capital accumulation continues until the moment of recycling itself).

The licence can either permit its holder access to EU ports for a year (annual) or for a month (monthly), allowing ships with low frequency of EU port calls the option of cheaper licence fees over the year. Resulting figures for the seven ship size categories are presented in the following table.

Table 4.1 Amounts to accumulate and costs of the licence

ship size category	**0**	**1**	**2**	**3**	**4**	**5**	**6**
(DWT 000's)	0,5-5	5-10	10-20	20-50	50-100	100-200	>200
total amount to accumulate	€ 14.912	€ 29.825	€ 59.649	€ 149.123	€ 298.246	€ 596.491	€ 745.614
annual	€ 810	€ 1.650	€ 3.300	€ 8.200	€ 16.500	€ 33.000	€ 41.000
monthly	€ 108	€ 220	€ 440	€ 1.093	€ 2.200	€ 4.400	€ 5.467

Impact of accumulated ship recycling revenue on ships choosing safe and sound ship recycling

Based on the above inputs on the licence costs, and using data on port calls for 2014 that show a population of over 18,000 unique ships that call annually in EU ports, the choice for either an annual or monthly licence can be calculated for each ship based on their specific call frequency over the year (see also the previous section in the calculation mechanisms used in the model).

Using modelling on the behaviour and financial accumulation for each of these ships, some 26,000 licences will be requested per year: as part of the fleet opts for multiple monthly licences, the overall annual number of licences is higher than the annual number of unique ships visiting European ports.

Based on this, the results show that at the end of the expected lifecycle of each of these ships, 42% of the ships currently calling at EU ports will accumulate sufficient funds to choose safe and sound ship recycling. If the licence fee rates are increased and/or if the duration of capital accumulation is shortened, this percentage will increase up to 68%, as shown in the table overleaf. In the long run, up to 97% of the

48 *This shorter period of licence fee payments is in the interest of a stable second hand market, see also the section on this impact hereafter.*

ships operating in European ports will be able to accumulate sufficient funds for covering the gap of sound recycling.

Table 4.2 Impact of the incentive under various assumptions

Design assumptions	Increased fee by	Average % of ships going for sound recycling	Lowest & highest % of ships going for sound ship recycling by age category	Lowest & highest % of ships going for sound ship recycling by size category[49]	LDT soundly scrapped at year 25 (million)	Cumulative size of the fund at year 25 (€billion)
Original (15 year payment & 20 years of financial accumulation)		41.6%	0% (16-20 years) 82% (6-10 years)	20% (category 3) 59% (category 2)	3.8 million	€2.5 billion
50% higher fees	50%	61.2%	0% (21-25 years) 96% (0-5 years)	52% (category 0) 82% (category 4)	6.2 million	€3.5 billion
100% higher fees	100%	67.8%	0% (26-30 years) 97% (0-5 years)	56% (category 0) 83% (category 4)	7.1 million	€4.5 billion
10 years of payments & 10 years of financial	44%	64.7%	0% (26-30 years) 96% (0-5 years)	58% (category 0) 85% (category 4)	6.8 million	€3.8 billion

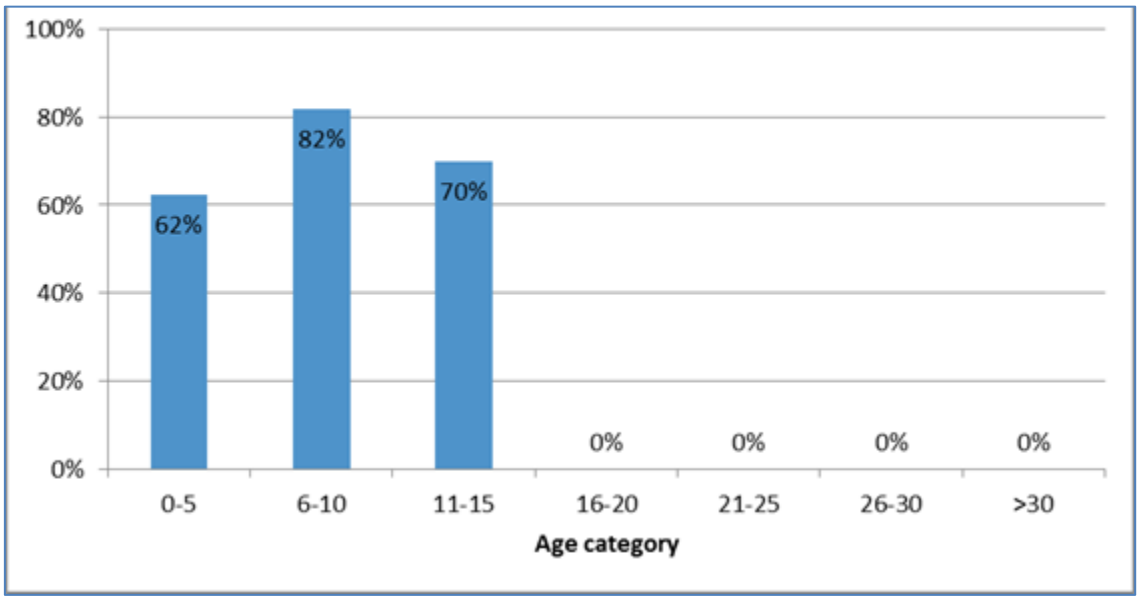
49 *Excluding size category 6, which has only 4 ships & the design is to have at least recycled soundly. Therefore the share is always 25%.*

Design assumptions	Increased fee by	Average % of ships going for sound recycling	Lowest & highest % of ships going for sound ship recycling by age category	Lowest & highest % of ships going for sound ship recycling by size category[49]	LDT soundly scrapped at year 25 (million)	Cumulative size of the fund at year 25 (€billion)
accumulation						
10 years of payments & 20 years of financial accumulation	68%	60.0%	0% (21-25 years) 96% (0-5 years)	52% (category 0 & 3) 81% (category 4)	6.1 million	€3.4 billion

Current vessel age however is an important distinguishing factor. The current age of ships is crucial in their ability to acquire sufficient funds to incentivise them to opt for safe and sound recycling, as capital accumulation takes time. Given the design of the licence, it is no surprise that ships older than 15 years when the financial instrument is initiated are not able to accumulate sufficient amounts to persuade them (based on accumulated funds alone) to opt for safe and sound recycling[50]. Of the newer ships, substantially higher shares (up to 82%) will accumulate sufficient funds to cover the revenue gap. If the design is adjusted to include a shorter accumulation horizon and/or higher licence fees, this will increase up to 97% as shown in the table above.

An option is to use the funds forfeited from ship owners not opting for sound recycling to smoothen this transition period. This will be elaborated up in Chapter 5.

Figure 4.2 Percentage of ships calling at EU ports using sound recycling, by age category



Volume of ships scrapped in a safe and sound manner over time

Leading on from the analysis above, it is important to consider how the individual behaviour of ships will develop over time. Typically, as accumulation of capital takes time, the effectiveness of the mechanism in terms of the volume of sound recycling achieved also evolves over time. The financial model is used to estimate the volume of ships, measured in total light weight tons (LDT) of all ships offered for safe and sound recycling as a result of the licence, over the next 25 years.

While for the first 15 years hardly any ship is able to accumulate sufficient funds to incentivise sound recycling[51], the anticipation of the scheme and the fact that already substantial capital will be accumulated means that some may still opt for sound recycling. However, the estimates show that there is a dramatic increase once the designed effect of the licence is felt – from about 18 years after introduction onwards – and that a levelling occurs after about 25 years (ceteris paribus).

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50 The fact that ships between 0-5 years have a lower percentage than ships between 6-10 years, is due to the different composition of the fleet. Furthermore the population of this study is fixed in time and therefore it does not take into account how the composition of the world fleet will change.

51 This is to be expected, given the design of the licence.

Figure 4.3 Volume of ships (in mln LDT) offered for sound recycling over time

Scrapping scenario – where will the vessels be recycled

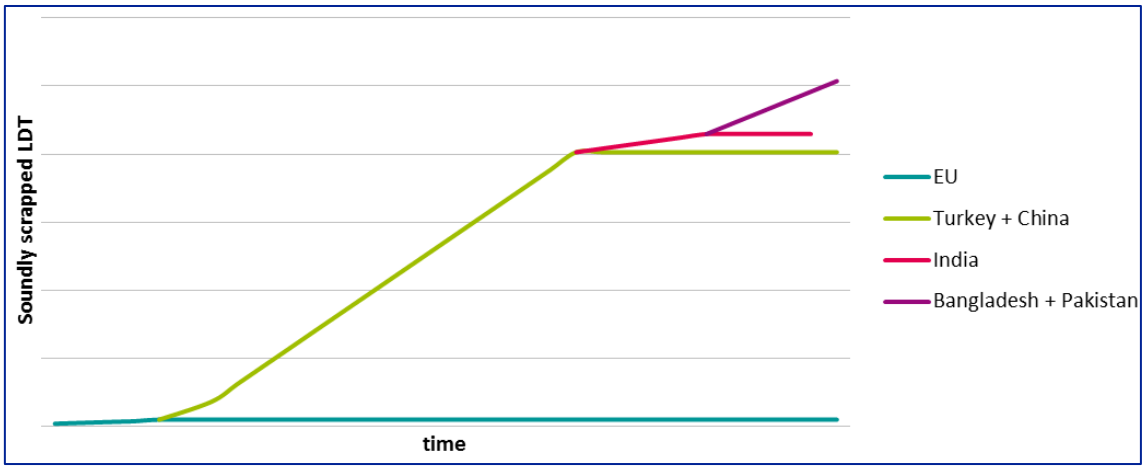
It is unrealistic to assume that all scrapping regions will develop sound recycling facilities at the same pace. Therefore once the fund is in place, i.e. from year one onwards, ship owners will not immediately be able to opt for sound recycling in all scrapping regions, but choice will be limited to those countries that have facilities accepted on the EU list. Over time this list will likely extend as more facilities will invest in complying. In any case, it is expected that some regions will offer sound recycling facilities earlier than others, causing a short-term shift in market shares between those regions.

It is likely that in the early years of the financial instrument sound recycling facilities will mostly be available in the EU (as these yards already use the highest standards available), whereas yards in other more advanced recycling countries like Turkey and China will gradually adapt to the higher scrapping standards as well. According to the finding of an EMSA workshop in 2011, both countries make progress in improving their recycling practices (e.g. beaching in China is prohibited by law)[52]. The adaptation process in India, Bangladesh and Pakistan is expected to take the longest. Therefore it is likely that the share of EU yards will (at least temporarily) increase compared to the current market breakdown.

The graph below gives a schematic presentation of this scenario, indicating that while sound recycling facilities in Europe are likely to serve the demand in the early years, other markets will pick up as demand increases and more capacity will be needed.

52 *EMSA, Workshop on ShipRecycling, 27 & 28 June 2011, Lisbon. See http://www.safety4sea.com/images/media/pdf/EMSAship-recycling-workshop-110825.pdf*

Figure 4.4 Indicative trend expectation on the availability of sound scrapping facilities (in LDT).



The above schematic scenario however could also evolve differently – for instance, it is possible that not all yards in, say, Turkey, will be listed at once, while yards in, say, China may also be added, resulting in a less black and white development.

Even though Europe might gain some market volume in the starting period, this share is expected to decline if/once other markets pick up. That would imply that EU, Chinese and Turkish yards would benefit from temporary additional demand but in the long run would be pushed back to smaller market shares, possibly in the ranges of their current overall recycling market shares once sound scrapping capacity is established. This might also create an additional stimulus to make this happen.

The above results also indicate that if sound recycling demand would evolve as predicted by the financial model (figure 4.3), the current EU capacity[53] would not suffice and additional capacity would be needed, either by accepting yards from other regions onto the list, or by expanding EU capacity.

More factors are decisive for recycling decisions

The financial instrument as designed in this study targets the revenue gap between sound and unsound recycling, and stays away from other market variables in particular regional steel price differences, but also other factors that vary over time as well as between markets and regions. As shown in chapter 1, demolition prices between the main recycling countries can differ substantially, and the balance between countries can shift in time.

The volatility of such factors, which are beyond the control of the financial instrument, may result in situations where the price advantage of certain scrapping markets may be so large that the resulting price gap cannot be covered from the sound vs unsound revenue gap alone. In such situations ship owners that have accumulated sufficient capital under the instrument may still opt for unsound recycling. Likewise, there may also be future situations where the scrapping prices are such that the accumulated capital covers more than the required amount, and ship owners that have accumulated less than the full amount are then still incentivised to opt for sound recycling.

53 Some 50,000 LDT per annum.

The impacts calculated hereafter refrain from such volatility in recycling market conditions, which means they may either overestimate or underestimate the year on year impacts, but should nevertheless provide a reasonable estimation of average the impacts in the long run.

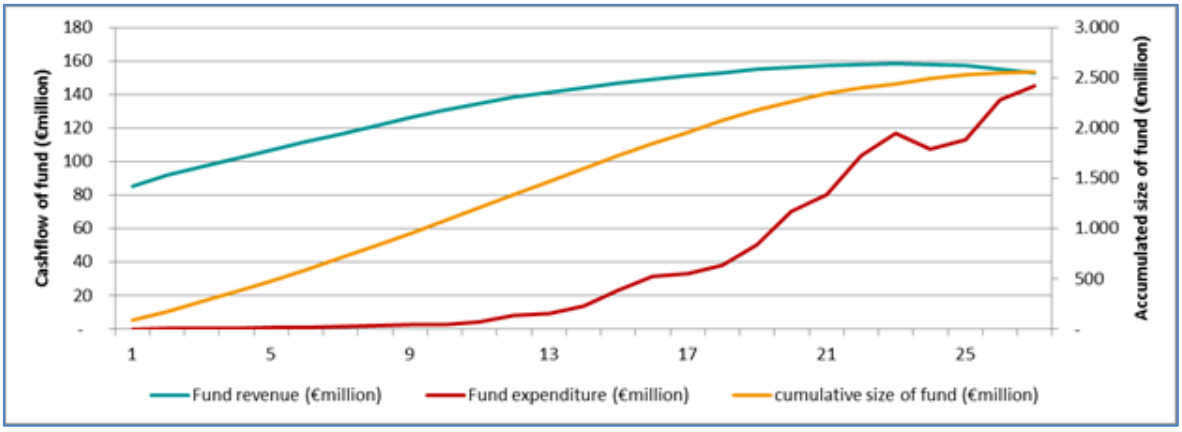
Cashflow of the Ship Recycling Fund

The resulting impact of the delayed effect of safe and sound recycling (due to the fact that it takes time to accumulate funds)[54] is that although licences are purchased by all ship owners calling at EU ports from the very first year the instrument is in place, the money is paid out to the ultimate owners of the same ships offered for safe and sound recycling much later (i.e. when soundly recycled). Also, for the early years, large parts of the accumulated funds are not released to the ultimate ship owners, as they are assumed not to opt for sound recycling – based on the limited financial incentive resulting from insufficient funds accumulated in the short period – and thus accept forfeiture of their funds. This has cash-flow implications for the fund, which are estimated in the model.

The results show an increasing, yet relatively stable growth of fund revenues[55], until a levelling around €150 million per year about 15 years after introduction. On the other hand, as mentioned above, the expenditure of the fund remains rather limited for the first 20 years, but then steeply climbs to almost parity with the revenues[56].

This intermediate period where revenues are larger than expenses, before a long term equilibrium is reached, means that there is a sizable fund of money that has been forfeited by ship owners (as a result of their choice for unsound recycling, due to not having built up enough financial capital to incentivise safe and sound recycling). The model estimates that this cumulative fund will reach just over €2.8 billion, before levelling out. This money can be used elsewhere (as the fund allows), or function as temporary fund to help smooth the transition period during the first 20 years. The methods to use these funds will need to be elaborated as part of the fund implementation (see chapter 5 roadmap).

Figure 4.5 Fund revenue and expenditure (left axis) and accumulated size of the fund over time (right axis)



A consideration for the start-up period, up to about year 20, would be to use excess funds to support a larger part of sound recycling, i.e. for those ships that have not yet accumulated the required amount due to shortage of accumulation time. In Chapter 5 further considerations in this regard are given.

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54 As mentioned earlier this can be introduced through the introduction of possible transitional measures.
55 Partly caused by changes in fleet type, frequency of calls and new ships entering EU waters.
56 This is not by chance, but has rather been the design aim of setting the level of the licences adequately in order to eventually achieve almost parity.

Impacts on maritime trade and port competition

Subsequently, using data on operational and port related costs, the model is used to define:

- The annual average costs per ship calling at EU ports resulting from the financial instrument;
- The share of these costs vis-à-vis annual costs of port calls;
- The share of these costs vis-à-vis annual shipping operational costs.

Licence costs vs shipping costs

The costs of the licence are taken to be linear with ship size (as the cost gap to be covered is measured in € per ldt). However ship operating costs are not linear, with bigger ships having economies of scale over smaller ships. This means that the ratio of licence costs over operating costs increases with ship size. Using daily operating costs[57] for a number of ship types this results in ratios of 0.5% for smaller ships to about 2% for the largest ship categories.

It is noted that operating costs of ships can be volatile over the years, as a result of changing oil prices as well as operating profiles (e.g. under weak market conditions, ships may be laid up for a period of time).

Impacts on maritime trade

Literature on the relation between transport costs and trade indicates a strong relation between the two, with elasticities estimated in the range of -2 to -3.5.[58] However these address the total transport costs, not just the 'maritime leg' indicated above, and for many trade pairs the handling and land side costs make up the larger part of the overall transport costs, therefore resulting in a fairly limited impact on total trade from a small change in maritime transport alone.

What may however be more important is the distribution of trade, both between regions and between transport modes. The increase of shipping costs is understood to be larger for intercontinental than for intra-European shipping, favouring intra-EU trade as a result. However, as maritime transport costs increase relative to land transportation, there may be a shift towards road or rail transport within Europe. Studies on, for instance, Emission Control Areas in the Baltic and North Sea and on fixed links like the Channel Tunnel or the Fehmarnbelt point to this impact, giving significant impacts on a regional level. However these impacts are only found in a limited scale and on few routes. Studies on climate change and the Arctic Sea route indicate a potential shift of trade in the long run from the Suez to the Arctic route, resulting in an overall increase of Europe-Asia trade but also a shift within Europe away from southern and eastern to north-western countries; such shift however is not expected in the next few decades.

Since the financial instrument will cover the EU28 in an equal way, cost changes will likely not cause major shifts within Europe. On particular corridors where competition between shipping and road/rail transport is fierce, shifts might occur. This is most likely to happen for RoRo/ferry routes.

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57 Greiner (2012).
58 See e.g. Behar &Venables (2008), Transport costs and International Trade, for a meta analysis.

Impacts on port competition

The competition between ports may be affected by the financial instrument, whether it is competition between EU and non-EU ports or competition between ports within the EU. With regards to the former, the re-routing of ships to neighbouring ports is considered, although traditional shipping patterns may not easily be shifted in all markets. For instance, the container segment is more flexible than the chemicals' sector as the latter often serves particular industrial facilities whereas the former can be re-arranged through hub-and-spoke models.

Port call costs are part of the overall shipping costs. Their importance varies by segment. For instance, in short sea shipping with high frequencies of call, their share can be up to 50%, whereas for intercontinental container trades it would be in the range of 15%.[59] For low call frequencies, as seen in the bulk carrier market, it may even be less. On the other hand, individual ports may have different pricing strategies towards different user segments, affecting the relative costs of port calls.

If we take an average cost per call of some 0.5 EUR/GT[60], the costs of EU port calls would raise by about 2%. This could be compared with figures found in previous studies on a financial instrument, for example Milieu (2013) indicating a charge per call of € 0.01 per GT, which is also about 2% of the costs per call.

For segments having very low frequencies of call the increase of port call costs can be up to about 20%, as the licence costs are fixed independent of the number of EU port calls (only allowing the choice between yearly and monthly licences but assuming yearly licences are chosen for all ships with call frequencies above seven times per year). This result suggests that a further refinement of the licence tariff regime could be considered in the interest of low frequency calling ships – which would then negatively influence the effectiveness of the mechanism.

Analyses using Ecorys' container port competition model indicate that shifts between ports within Europe are likely to be very minimal, since the cost change applies to all ports in the EU. Based on current differences in the costs of call, there may be a small advantage for the more expensive ports as the licence costs will be independent of individual ports.

Impact on transhipment markets

Generally, measures raising the access costs to European ports might be seen as a risk to port business, with shipping operators trying to avoid the regime through shifting their routeing to neighbouring non-EU ports. For most of the market segments this is not a realistic option as cargoes need to be delivered at their ultimate destination anyhow. The transhipment of containers is an exception. Transhipment is designed as a type of hub-and-spoke operation: major ships operating on intercontinental routes unload large volumes of containers at a transhipment port, where they are loaded onto other, smaller vessels to ship them to their final destination.

Typically, mainline routes between Asia and Europe call both at Mediterranean transhipment ports such as Marsaxlokk, Gioa Tauro and/or Algeciras, and at northern European ports like Le Havre, Antwerp, Rotterdam and/or Hamburg. In a regime where ships have to a pay a levy for every port call, they may consider shifting their Mediterranean calls to non-EU ports like Port Said or Tangier to avoid these costs, while still calling at some of the northern European transhipment ports.

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59 Ecorys (2006), Complementary Economic Evaluation study on the Commission proposal for a Directive on market access to port services. Study for EC DG MOVE.

60 Ecorys (2006) based on an inventory of tariffs of 20 ports across Europe.

For a regime where ships pay a fee on a timely basis (monthly or yearly licence), there is no benefit of shifting to non-EU Mediterranean ports as for calling at northern European ports a licence is still required.

For intercontinental routes not including northern European port call but only Mediterranean calls, such as Round-the-World and Pendulum services connecting the Far East via the Mediterranean with North America routes, such a shift may provide advantages. This segment however is only a small part of the transhipment volumes handled in Mediterranean ports.

Example Malta

Malta Freeport handled 2.9 mln TEU in 2014[61]. The port is one of the major Mediterranean transhipment ports, and according to the terminal operator Malta Freeport, over 95% of the container volumes handled can be considered transhipment.[62]

A modelling study by Veldman and Rahman (2008)[63] assesses how the competitive position of a Mediterranean transhipment port changes as a result of changes in the relative costs of using the port. According to their model simulations, an increase in the costs of transhipment with € 10 per TEU for Marsaxlokk will lead to a decrease in transhipment demand of 24%, which would seem a very significant impact. This impact assumes a cost increase only in one port, with all other transhipment ports, EU and non-EU, remaining at their original cost level.

How does this compare to the ship recycling licence? A containership of 10,000 TEU would be faced with an annual licence fee of about € € 36,000 per year. If we assume 3 EU calls per month of which one in Malta, that would translate to € 1,000 assigned to each Malta call. If we assume that per call a volume of 2,000 TEU is unloaded, this would mean € 0,50 per TEU, which compared to a typical handling rate of some € 100/TEU is 0.5%. Against an elasticity of -2.2 this would give a 1% decline of transhipment demand for the port. However, as container liner services would gain nothing from shifting away from Malta if they would still call at northern European ports, likely only a part of the transhipment calls (e.g. those routes that only involve Mediterranean EU port calls) will consider this option, leaving a much lower overall impact for the volumes handled in the port. Furthermore, as other EU transhipment ports would be faced with a similar increase, the options for deviation are limited to only a few non-EU transhipment ports, and some may not be attractive given their further distance from the final destination ports, particularly as, according to the calculations of Veldman and Rahman, feeder costs make up a significant part of the equation.

For other segments, especially bulk cargoes as these are usually captive (consumer industries based in Europe), a shift of trade is also not likely as various DEA studies point to large gaps in port performance levels between EU and African ports.

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61 Source: Transport Malta; [http://www.transport.gov.mt/admin/uploads/media-library/files/cargo%20throughput%202004-2014.pdf_20150515115043.pdf]

62 [http://www.maltafreeport.com.mt/faq.aspx?id=107969]

63 Veldman, S.J.J. and A. Rahman (2008). A model of transshipment port competition: a test with cross-section and time-series data for the Mediterranean. IAME conference Dalian, January 2008.

Other economic impacts

Other elements of economic impacts include:

Impacts on the position of EU-listed shipbreaking yards

Obviously, a direct implication of the aim of the instrument is that the competitive advantage of EU-listed yards vis-à-vis non-listed (unsound) ship recycling facilities will improve – or alternatively phrased, their current disadvantage will be reduced. The results from the financial model presented above give an understanding of the number of ships likely to go for sound recycling instead of un-sound recycling, thus showing the growth of demand for sound recycling. This demand will gradually increase as the number of ships that have accumulated sufficient funds to cover the cost gap rises.

Employment impacts for the EU

The employment impacts for the EU will depend on the volume of ships (measured in LDT) recycled at EU yards. The SRR Impact Assessment indicates that 73 workers are needed per 100,000 LDT at EU yards.

Currently EU yards have a market share of 0.6%, equalling 18,700 scrapped LDT per year (2014 data), which, based on the figures provided in the SRR Impact assessment, would equal 14 man-years of employment. If as a result of the financial instrument the demand for EU ship recycling would increase to its maximum capacity, and as explained above it is assumed that on the short run sound scrapping can only take place at EU yards, employment levels would increase to about 35 man-years. If recycling capacity in the EU would be expanded further this might increase even more.

In the long run, however, if/once other recycling markets have invested and enter the EU list, competition may cause the EU's market share to decline again and the employment impacts might resorb.

Impacts of specialist segments

- Service vessels: the SRR applies to all ships of 500 GT and above, thus leaving out small ships like tug boats and pilot boats, while larger sized service ships, e.g. dredgers, will be part. Also exempt are ships that operate solely within national waters of a Member State, under whose flag they fly (art 2(c)). For ships not operating within an EU Member State for the duration of their lifetime this may cause a challenge. Vessels such as dredgers may for example operate in European waters (e.g. dredging port access channels) for long periods of time but may then be transferred to operate for multiple years on assignments outside of Europe. Thus, this would create an unpredictable patterns of EU port calls and thus a potentially volatile licence scheme (i.e. licence in place for some years when operating in Europe, then some years not, then again etc.). Ultimately, this creates a risk of not being able to predict whether they will reach the required capital amount over their lifetime. On the other hand, dredging companies typically remain owners of their ships throughout their lifetime and they could take measures to ensure that coverage is in place to allow for sound recycling;

- Shipbuilding sector: For ships built in Europe but leaving the EU immediately after their handover for operations elsewhere, the EU ship yard may be required to purchase a (monthly) licence in order to conduct trials from a nearby EU port, posing them to (small) additional costs. It could be considered to have an exemption for the first port of call of a ship's life. However, the licence costs concerned in this case are minimal compared to the price of a new ship and are not likely to have major impact on the competition between EU and non-EU shipyards.

On the contrary, the scheme might have positive impacts as it might stimulate greening of ships which allow for easier sound scrapping (this would even be further strengthened if discount for green ships would be introduced on the licence in a next stage)

Impact on the second hand market

The capital accumulated during the operating life of the ship is tied to the ship. That means that upon sale to a second owner, the first owner transfers the future rights to the second owner, and so on until the ultimate owner offers the ship for sound recycling. If all subsequent owners operate in Europe, they will continue applying for licences and paying fees into the fund, ultimately leading to the capital amount required being fully accumulated. However, if subsequent ship owners operate outside the EU, they will purchase less, or none, licences after the moment of sale, and the capital accumulation will eventually be insufficient to cover the revenue gap of sound recycling. As part of the licence design, payments for accumulation are made for the first 15 years of operation only, after which the owner just pays administrative fees.

In an ideal case, the value of the capital accumulated is fully taken into account in the sales price. In practice however this may not be so, implying a loss to the first owner. The level of loss will differ depending on the age of the sale as well as the intended operating profile of the buyer.

- **Example 1**: A short sea container ship is operated within Europe from its construction until the age of 15. The owner has purchased annual licences throughout this period. A second owner buying the vessel intends to operate the ship partly in Europe and partly elsewhere. For obtaining a licence the owner will not have to pay the full licence fee anymore since the contribution period of 15 years has passed, and only pay for the administrative costs. By year 20, the capital accumulated covers the revenue gap, so that the owner can opt for sound recycling without a loss. To this owner, the capital accumulated at year 15 – the year of sale – has its full value, and can be taken into account fully in the ship's sale price;
- **Example 2**: A ferry was operated in Europe from its construction until the age of 10. A second owner will operate it fully outside of Europe, and will not continue the capital accumulation. This owner will operate the ship until year 30. The capital amount will continue to grow meanwhile, and by year 30 will have reached 80% of the required amount. On this basis the ultimate owner may still be incentivised to opt for sound recycling. If he would wish to recycle much earlier than this age, it may no longer be the case (e.g. at the age of 20 years the accumulation only reaches 70% of the required amount). As a consequence, the second owner (buyer) may not be valuing the full amount accumulated at the moment of sale, but as there is still a fair chance that accumulation results in sufficient funds at the end of life (especially if by this stage the return on capital has been higher than the conservative estimate applied), they may still value it partly and it may be considered in the sale price;
- **Example 3**: A bulk carrier was operated between Europe and South America, with 3-4 calls per year in EU ports, therefore opting for monthly licences every year. After 15 years, the accumulated capital is therefore only one third of the amount that would have been accumulated on the basis of annual licences. When sold to a new owner at this age, who will continue the same operating profile, the capital will not accumulate the required amount by age 30 and the ultimate owner will not financially be incentivised to opt for sound recycling by the instrument. The buyer will therefore attach low value to the accrued capital and it may be lost to the first owner.

The value of the accrued capital at the moment of the sale can also be compared with the sale price. For example 70,000 dwt panamax tankers built 5 years earlier have been sold at prices in the range of 25-40 mln USD during the years 2010/2015, declining to 17-30 mln USD for 10-year old vessels.[64] Comparing this with a revenue gap of about EUR 250,000 of which about half is accumulated by year 10, the potential loss for the first owner would amount to less than 1% of the sale value. As sale prices are rather volatile and related to shipping market conditions this share will vary over time.

Administrative costs impacts

The proposed model of a Ship Recycling Licence and a combination approach of allowing both public and private mechanisms to accumulate capital will create administrative costs at various levels:

- The authority issuing the licence will incur administrative costs associated to the verification of whether an applicant meets the requirements for receiving the licence, and collecting the retribution to be paid for this. A model of a web-based portal is envisaged to keep such costs low;
- The agency collecting the premium and managing the funds (be it a public fund or a private financial institution) will incur costs. For a private financial institution, such costs would be kept as low as possible and may relate to the premium paid and/or to the return on capital realised by the fund;
- Port State Control, or in other words the authority verifying whether the licence is in place for ships calling in an EU port. This could be done as part of the regular control activities already taking place and the procedure streamlined so that the checking of an additional document can be done with little extra effort;
- Administrative costs related to the verification of sound recycling, as a basis for paying out the accumulated amounts.

In order to assess the administrative costs of the organisation responsible for managing the fund and providing the licences, the EC Standard Cost Model (SCM) has been used. This model is based on the following formula

$$\sum P \, x \, Q$$

Where P (for price) = Tariff x Time and Q (for quantity) = number of businesses x frequency.

The costs of licence verification

The **tariff** is the hourly rate of an EU civil servant responsible for approving the licences (i.e. their salary costs per hour). It is assumed that civil servants in function categories 5 – 8 will be part of the team. As the current mix of employees is unknown yet, an average salary is assumed. The salaries as laid down in Regulation 423/2014 were used to calculate an average salary.

In addition to the hourly rate, a compensation for overhead expenditures has been added to the tariff. An average overhead of 30% per employee is assumed. This percentage is in line with overhead calculation of other EU institutions, e.g. EMSA, Europol and Eurojust.

64 *Data from Shipping Intelligence Network provided through DNVGL.*

Time is defined as the average time needed to process a licence application and handle the payment of the contribution required. It is assumed that on average this will take one hour. For vessels often visiting a European port, this procedure can probably be shortened, while for vessels less frequently calling at EU ports, the procedure might be longer.

The financial model developed during this study provides the average number of licences issued per year (= **quantity**). Therefore the total number of licences is the assumed Q (as the model already calculated the number of business and the frequency). The total number of licences issued per year is roughly 26,000.

Based on these inputs, the total yearly administrative costs are estimated to be € 1.3 million. The outcomes of this calculation are rather robust. An increase or decrease in the number of licences issued will not substantially influence the costs. The indicator having the largest impact on the cost level is the average time to assess the licence. If the average time per request is increased from one hour to 1.5 hours the total administrative costs will increase to € 2.1 million per year, while a time reduction from one hour to 0.5 hours will lead to total administrative costs of less than € 700,000.

Taken together the administrative costs amount to about 0.8% of the gross levies to be paid annually. These costs have already been covered in the gross annual licence costs presented above.

The costs of verification of sound recycling

Besides verifying whether or not ships calling at EU ports indeed have a licence indicating that they are saving for sound recycling, the authority/agency also has to verify if the ship was recycled in accordance with the SSR at an accredited facility, by demanding proof of delivery, the required recycling plans, and possibly also by on site verification. The verification of yards that have been accepted on the European list in accordance with the SRR is already foreseen by the Commission. Therefore, the financial instrument would not necessarily bring extra costs.

If however in addition a check of the sound recycling of individual ships is desired, this could be added as a task and be performed on the basis documentation of delivery. Additional checks through the use of AIS and satellite images could be considered, possibly extended with on-site verification in cases needed.

Impacts on fiscal revenues of EU flag states

One of the concerns related to the SRR is that, once entering into force, ship-owners of EU-flagged vessels, that currently scrap their vessels still flying an EU flag, will re-flag their vessel shortly (say: a year) prior to recycling in order to avoid any SRR related sanctions. By doing so, the original Flag State would miss a year of fiscal income.

The data published by the NGO Shipbreaking Platform indicate that in 2014 a total 1,026 vessels were scrapped, of which 64 vessels (6.2% of all vessels) were still flying the flag of an EEA country while being scrapped at a South-Asian yard. When measured in GT scrapped, EEA flagged ships in 2014 covered 1.6 mln GT or 7.2% of the total volume scrapped.

For each of the EU countries of which one or more ships were recycled in Asia in 2014, the foregone fiscal income has been calculated, using each country's tonnage tax system (data taken from the "Shipping Almanac 2014"[65]).

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65 Ernst and Young, (2014), 'Shipping almanac 2014'

As the table below indicates, most vessels (21 in total) had the Maltese flag. Another 11 were flying the Greek flag. When measured in GT scrapped, the highest share was provided by the UK (409,000 GT), followed by Malta (396,000 GT) and Greece (255,500 GT).

Foregone fiscal income for all eleven countries together would have been around € 750,000 – 800,000 on an annual basis. Half of this would be incurred by the UK who will miss almost € 358,0000, followed by Greece (€ 133,000) and Italy (€ 101,000). Overall, it seems that the impact of foregone income on ships out-flagging in the year prior to scrapping is limited for all these Member States, compared to their overall fiscal revenue from their flag registers.

Table 4.3 Vessels flying EEA flag when scrapped in Asia

Flag state	Number of ships	Total GT scrapped	Foregone tonnage tax (EUR)
Bulgaria	1	7,455	n.a.
Cyprus	9	240,176	31,388
Denmark	1	1,525	2,628
Greece	11	255,556	133,110
Italy	4	115,616	101,337
Malta	21	396,385	66,960
The Netherlands	1	5,818	7,043
Norway	4	174,831	41,473
Romania	1	198	n.a.
Spain	2	19,562	25,628[66]
United Kingdom	9	409,060	357,502
Total	**64**	**1,626,182**	**767,069**

Source: NGO Shipbreaking platform (2015), final list of 1026 dismantled worldwide in 2014. Fiscal data for Romania and Bulgaria lacking.

4.2.2. Social impacts

One of the main objectives of the SRR, which the financial instrument is aimed to help achieving, is to improve the conditions of workers in the ship recycling industry, by requiring proper health and safety conditions on the work sites.

Social impacts of a financial instrument for safe and sound ship recycling will mainly concern changes in employment and in the safety of working conditions of sound versus unsound recycling facilities. As a larger part of the number of ships recycled moves to sound recycling (as resulting from the model calculations presented above), we may expect better working conditions for workers. In the short run, it may however also imply a shift of employment from unsound yards (unemployment of workers of non-sound yards due to reduced demand) towards other yards included on the EU list or towards other sectors.

66 *Might be lower, as only the days of operation are taxed. Based on current information it is not possible to incorporate this in the calculation.*

In the Impact Assessment to the SRR (2012), calculations of employment impacts by recycling country were made using assumptions on labour intensity. Similarly, assumptions on improvements of health and safety were made on the basis of accident data. Using these assumptions as a basis and combining them, with the forecast of sound recycling demand resulting from the financial model, the social impacts can be calculated.

Social impacts primarily relate to the effectiveness of the instrument to promote sound and safe ship recycling. In order to calculate social and environmental impacts of the financial instrument, assumptions on the location of recycling are needed. The SRR IA gives employment and working condition factors by recycling region, for various performance levels of yard (AAA, AA, substandard etc.). By taking the scenario for long run market shares by recycling region as presented above and assuming competition between sound recycling from all regions has developed, the highest social impacts can be achieved in the countries with currently the lowest safety regimes. In particular, the following minimum number accidents per year would then be avoided in the countries where safety conditions currently are the lowest (e.g. Bangladesh and Pakistan as per the SRR IA). The resulting impacts are as follows.

Table 4.4 Minimum reduction of accidents as a result of the instrument

Safety issue	Impact of the financial instrument (reduction)
Fatal accidents (adults, yearly)	5
Non-fatal accidents (adults, yearly)	840
Fatal accidents (children, yearly)	1-2
Non-fatal accidents (children, yearly)	335

Source of data: SRR Impact Assessment (2012).

The above estimates should however be considered as very conservative estimates, because in the above analysis it is assumed that accredited yards will have an A rating only. According to the SSR Impact Assessment an A rating indicates that the minimum IMO levels are adopted, i.e. the requirements set out in the Hong Kong Convention are achieved. As SSR accredited yards will need to have higher standards of safety, the social impacts are likely to be higher, and larger safety impacts can be foreseen.

These reductions would be achieved when the financial instrument has reached its full effectiveness and large number of ships are sent for sound recycling (from about year 20 onwards as shown in figure 4.3).

In earlier years of its introduction, the impacts on social conditions will be less as lower volumes of ships will be recycled soundly. In addition, the relative role of more advanced recycling regions like the EU, Turkey and China will be higher in the earlier years, as pointed out above. This would imply that the contribution to the reduction of fatalities in earlier years would be relatively smaller from the point of view of introducing safe and sound recycling in these countries themselves (as they already perform better on fatalities), but have a higher impact on safety as a result of a shift in market share from substandard Asian yards to these countries. The resulting net impact is hard to assess.

4.2.3. Environmental impacts

Environmental impacts primarily relate to the effectiveness of the instrument to promote safe and sound ship recycling. The purpose of the instrument is to increase the number of ships opting for sound recycling instead of unsound recycling. An estimate of this number emerges from the financial model, resulting in growing numbers of ships over time as more ships are able to accumulate the full amount required to cover the cost gap, especially from year 20 onwards when the majority of ships has been able to accumulate sufficient funds to cover the revenue gap.

From previous studies, notably the IA for the SRR (2012), figures on estimated amounts of waste per ship can be derived, which will serve as a proxy to calculate the environmental benefit that a financial instrument incentivising larger numbers of ships to be recycled safe and sound will deliver.

Environmental impacts that may result as knock-on effects include:

- Possible advancement of Hong Kong Convention practices – more countries subscribing over time as the competitive advantage of sound recycling yards progresses;
- Impact on choice to scrap: earlier scrapping of inefficient ships (this will benefit overall operational environmental impact of shipping and contribute to faster improvements of the world fleet).

Another main objective of the SRR that the financial instrument should help to achieve is to reduce the negative impacts of unsound recycling on the world's (marine) environment. Sound recycling procedures will ensure that hazardous materials are treated carefully so that they do not enter into the environment.

The SSR Impact Assessment also provides guidance to assess expected environmental impacts that is applied here again, using data on the quantities of hazardous materials on board ships per unit of LDT, for eight different groups of hazardous materials. For each of these materials the study also indicates whether or not, in each ship recycling region, these materials are recycled according to the ESM standards[67] as required by the HKC (% of ESM recycled materials is presented).

As for social impacts, it is also assumed for calculations that accredited facilities perform at the level of A upgraded yards whereas other yards do not. Using the same data as used in the SRR impact assessment, this means environmental gains are achieved in all countries moving from unsound scrapping practices to sound practices, but that the largest potential gains are reached in India, Bangladesh and Pakistan. Again the SRR requires higher standards for safe and sound scrapping, hence increasing the impact.

Table 4.3 presents the potential pollution reduction in India and in Bangladesh/Pakistan if a financial instrument would be in place and sound recycling would take place at A rated yards in these countries. In reality, the savings will be higher as the waste management standards of the SRR go beyond those of HKC (ESM), and gains are also likely in other recycling markets (China, Turkey). Therefore the below figures should be considered minimum estimates.

67 *Environmentally Sound Management.*

Table 4.5 Expected (minimum) environmental savings of environmentally sound scrapping

Hazardous material		India	Bangladesh + Pakistan
Asbestos	Tons	160	77
PCB	Kg	0.3	0.2
Heavy metals	Tons	-	-
Oil	Tons	-	-
Oil sludges	Tons	21,239	8,510
Tri butyl tin	Tons	-	-
Mercury	Kg	0.5	0.2
Ozone depleting substances	Tons	16.5	7.4

Meanwhile, the shipbuilding industry aims to build cleaner vessels. Vessels newly built today are substantially cleaner than vessels built 30 years ago and it is likely that this trend will continue. In addition, the SSR introduces the obligation for each vessel entering an EU port to have an IHM on board. Both elements will probably lead to even cleaner vessels. Once these vessels are scrapped, less hazardous waste will occur and the overall environmental impact of ship recycling will likely be reduced.

4.3. Conclusion

The analysis of impacts presented above shows that a financial instrument involves annual payments of fees into earmarked funds in the order of € 150 million, contributing to the building up of a fund sized € 2.8 billion. Depending on the design of the mechanism (level of licence and duration of capital accumulation), this will eventually result in the long run in around 97% of the fleet calling at EU ports opting for sound recycling. As the mechanism will build up over time, for older ships this percentage will be lower, and of the fleet currently operating in Europe, over time around 42% to 68% (depending on the said design criteria) will be able to accumulate sufficient funds to opt for sound recycling.

This result provides impacts in terms of environmental gains (better management of ship's waste and less pollutants ending up in the environment untreated) as well as social gains (reduction of accidents and fatalities).

Meanwhile the mechanism also generates (partly intended) economic impacts, notably:

- A rise in operating costs for ship owners, who are forced by the instrument to set aside funds to accumulate the capital required. This rise is estimated at about 0,5%;
- An increase in costs of calling at EU ports, in the order of 2%;
- Due to these cost increases, maritime trade and port competition may be affected negatively, although both impacts are expected to be very small since the cost increase is limited and only concerns the maritime part of trade, and since it covers the EU as a whole;
- Other impacts may be felt in the second hand sales market;
- Administrative costs associated with the instrument include costs for issuing licences, managing the funds and performing inspections required for the pay-out to the ultimate ship owner upon sound recycling.

For all impacts it should be understood that the year-on-year behaviour of ship owners is also influenced by other factors, not least the shipping market itself and the steel prices that play an important role in overall recycling values. Other uncertainties include the exact pattern of port calls of ships over their lifetime, the revenue gap itself and the return on capital, for which sensitivity analyses have been conducted to show the robustness of the mechanism.

5. DETAILED DESIGN OF PREFERRED OPTION AND ROADMAP

5.1. Conclusions on the feasibility of a financial instrument

To be effective, a proposed financial instrument must be capable of inducing a change in behaviour on the part of ship owners towards the recycling of their ships in compliance with the SRR. More specifically, the current premium (in terms of higher revenue for the ship offered for scrapping) for ship owners who opt to recycle their ships at unsafe and unsound facilities – rather than at SRR-compliant facilities – must be neutralised or even reversed.

Various options have been considered for such a financial instrument in previous studies (Ecorys 2005, COWI/Milieu 2009, Profundo 2013, Milieu 2013). These options can be categorised into two groups:

- Obliging ship owners to collect the required capital through a privately managed mechanism that is attached to a unique ship. This concerns the instruments of a Ship Recycling Guarantee (SRG), the Ship Recycling Escrow-account (SRE) and the Ship Recycling Insurance (SRI);
- Obliging ship owners to contribute to a public regime (a fund) based on payments to be made when accessing EU ports (the port levy/Ship Recycling Fund option).

There are differences between the various options for a financial instrument within these main categories (either public or private). However, some of the most fundamental design elements (e.g. the amount of capital to be collected, duration, procedures for releasing money) apply to all options and influence the eventual, overall design of the options. In addition, specific design aspects exist for each individual financial instrument.

As part of this study, a first review of five different instruments was made, which were partly already investigated in previous studies. Key drawbacks of each of these instruments are summarized in the table below:

Option	Main shortcoming
Non-financial measures	Easy to circumvent or stimulating additional circumvention behaviour, ad/or lack of suitable enforcement mechanism.
Ship Recycling Guarantee	Difficult to transfer in case of change of ownership; disproportionate to ships with low frequency of calls at EU ports.
Ship Recycling Account	Difficult to transfer in case of change of ownership; disproportionate to ships with low frequency of calls at EU ports.
Ship Recycling Insurance	Lack of “insured object” due to lack of unforeseen event, other than loss of the vessel due to an accident. Not feasible as separate instrument.

Option	Main shortcoming
Port levy	High administrative burden for ports; potentially not WTO compliant; possibly considered as tax (outside the mandate of the EC).

As presented in the above table, non-financial instruments are not found to be very effective. Although options 2 and 3 would be possible for ships that are not expected to change ownership over (most of) their lifetime, it is less suitable as an instrument that would apply to all ships. Option 4 is not feasible as a separate instrument. Finally, there are serious questions regarding the legal feasibility of a port levy (option 5). In addition, the levy would be hard to establish and it would cause relatively high administrative burdens. That option was in fact rejected when first proposed to the European Parliament in 2013.

As an alternative to the port levy, we identified a new financial instrument – the purchase of a Ship Recycling Licence (SRL) as a mechanism to collect capital at port calls – which overcomes the main shortcomings of the earlier options. The principles of this SRL are as follows:

- By **obliging all ships that call at EU ports to obtain a prior licence** from a centralised European agency, an instrument of a public, administrative law nature is created. This licence requirement can be used to impose a financial instrument upon ship owners, which provides a financial incentive to opt for safe and sound ship recycling as well as a penalty (i.e. forfeiture of accrued rights) in case of failure to comply. Since the purpose for the creation of the licence is to achieve the public policy objectives of the Ship Recycling Regulation, this licence will be referred to below as the Ship Recycling Licence or SRL;
- The basic idea behind the SRL is that a contribution is charged to ship owners, when they apply for this licence. This contribution consists of two elements. The first part, a (small) charge to cover the administrative costs of issuing the SRL, is a retribution. The second part, **a premium, is levied from the ship owner, and transferred to the ship-recycling fund**, where it is administered separately ("earmarked") in a transparent manner, together with the other capital already accumulated by the relevant ship as an individual credit to a future payment of the same amount;
- **The amount of the premium levied depends on the capital amount that needs to be accumulated for the relevant ship and the set time-frame**, within which the capital is to be accumulated. The capital amount needed for a particular ship, in turn, depends on factors connected to the individual characteristics of the relevant ship (e.g. its size and ship type). To be effective in terms of recycling behaviour, the said capital amount would need to bridge the revenue gap between the revenues for a ship owner opting for ship recycling in compliance with the SRR and the situation in which the ship owner opts for the (currently) more lucrative option of non-SRR-compliant ship recycling;
- The full capital amount does not become payable until after the ship has been recycled. **It is payable to the ultimate ship owner and is subject to the fulfilment of a condition precedent**. Only if the ultimate ship owner proves that the ship has been recycled in compliance with the SRR at a ship recycling facility included in the European List, will the capital amount earmarked for the ship, be paid out. If, however, it becomes apparent that the ship has been dismantled in a facility not included in the European List, the ship owner forfeits the accrued rights to the payment of the capital amount. Once the forfeiture procedure to be prescribed has been concluded, the capital amount will be transmitted by the Ship Recycling Fund to a general benefit fund in the area of ship recycling. The said procedure will need to be an administrative law procedure at the European level,

which allows for the possibility of judicial review;

- In order to avoid that the SRL and the premium thus levied from ships calling at EU ports work out disproportionally for ships with either a very high frequency (e.g. tugboats and coastal vessels) or a very low frequency of calling at EU ports, **the SRL validity would be time-based rather than linked to the number of calls**. The duration of the SRL's validity could be differentiated, e.g. offering ship owners the choice to apply for an SRL with a validity of a month instead of a year, and to adjust the premium accordingly, in the interest of ships with very low frequencies of call in EU ports.

In the baseline situation, with the SRR in place, the amount of ships offered for sound recycling is still small. The financial instrument proposed will generate more substantial impacts, not immediately but over a time period of about 20 years, which is needed to allow capital accumulation. By then, on the basis of calculations made with the financial model developed for this study, about half of the world fleet currently calling at European ports will be incentivised to opt for sound recycling, increasing to about 97% for the newest ships sailing today. This will cause social and environmental benefits as a result of more strict recycling principles being applied. If also yards in South Asia adopt safe and sound recycling practices, these impacts will be highest.

Adverse economic impacts that the financial instrument inevitably generates include an increase of ship´s operating costs (in the order of 1%), costs of EU port calls (in the order of 2%) and small impacts on trade to/from the EU as a consequence of these cost increases. Furthermore, there may be impacts on the shipbuilding market and the second hand sales market of ships. Administrative costs of the mechanism amounts to about 0.8% of the licence fees.

5.2. Considerations for implementation

If the European Commission decides to adopt the recommendation of this study to introduce a financial incentive in the form of a Ship Recycling Licence requirement to be imposed upon all ships calling at EU ports, the following roadmap for implementation ensues.

The appropriate format for a legislative proposal to be made by the European Commission needs to be selected. Considering that the SRR itself is in the form of a regulation and further that the financial instrument is meant to supplement an existing regulation which in some respects is already in force, it follows that the legislative proposal must take the form of a draft-regulation as well.

The draft regulation could be envisaged both as an independent and self-standing regulation and as a regulation that aims to modify the existing SRR. In both cases (as with all legislative proposals) an impact assessment (IA) would be required. The current study provides most of the underlying support for this IA, in focusing on the financial instrument (in the form of an SRL). For other parts of the IA, use can be made of the previous IA as it is unlikely that a new impact assessment of the entire SRR (so not only the financial instrument) so relatively shortly after the previous one (2013), will bring many new insights. Therefore, in the short run, a self-standing regulation seems preferable. In the longer run, when the SRR is due for its periodical legislative evaluation, it may be considered to incorporate the two regulations into a single regulation to replace the SRR.

As explained above[68], the introduction of a Ship Recycling Licence requires that at the European level either a new European Ship Recycling Agency is set up, or an already existing European Agency is charged with the task of implementing the new regulatory

68 See Chapter 2.3, No. 11.

requirement. The main responsibilities of this agency, as described in more detail in section 2.3, seem to be the following:

- to process applications from ship owners for a Ship Recycling Licence;
- to collect and administer financial contributions received from ship owners;
- to issue (on-line) Ship Recycling Licences;
- to keep a public (and through internet) accessible database of past and current Ship Recycling Licences issued to ships;
- to administer the accrued capital under the IMO number of the relevant ship;
- to transfer periodically the total of contributions received from ship owners to a European financial institution, e.g. the European Investment Bank (EIB) for fund management;
- to monitor where and at which facilities ship recycling takes place, especially of ships that have accrued rights to a future payment under the proposed European ship recycling regime;
- to decide upon applications to pay out the accrued capital after completion of ship recycling;
- to transfer the accrued capital to the ultimate shipowner;
- to decide about forfeiture of the accrued capital if a given ship is not recycled in compliance with the SRR;
- to transfer forfeited capital amounts to a general purpose Ship Recycling Fund;
- to manage policies to use the forfeited capital assembled in the general purpose Ship Recycling Fund in accordance with the public policy objectives of the SRR.

With regards to this last point, it was debated among stakeholders whether funds forfeited by non-compliant ship owners could be used to cross-subsidise ship recycling facilities to assist them in reaching the standards imposed under the European List or that such forfeited funds might only be used to subsidise other (ultimate) ship owners in cases where their ship has accumulated less than the full capital amount, on the condition that they opt for safe and sound ship recycling. It is suggested that this matter should be further explored and considered by the Commission in the context of developing its policies on how to best use the forfeited capitals in accordance with the objectives of the SRR. Addressing this element – in particular to achieve more sound recycling in the short run – would be recommended to raise the effectiveness of the instrument. This should also be offset against the available capacity for safe and sound recycling in the short run.

A useful suggestion made at the second stakeholder meeting is that to also encourage non-EU flagged ships to use an approved ship recycling facility under the proposed financial instrument, it is necessary to introduce a parallel certification and notification regime, similar to the one which currently applies to EU flagged ships under the Ship Recycling Regulation, applicable to the non-EU flag state and monitored by the Ship Recycling Agency.[69]

Furthermore it has been debated whether, after implementation of the proposed Ship Recycling Licence requirement, a ship would be denied access to an EU port simply for not having a valid Ship Recycling Licence. If enforcement of the ship Recycling Licence were to depend solely on inspections by port state control, there is a concern that ships, which call at EU ports infrequently, might decide that not obtaining the licence is worth the risk.

Although it is difficult to generalise for all EU ports, it may be observed that the introduction of a Ship Recycling Licence requirement not only creates a regulatory requirement for ships calling at EU ports, but also has implications for EU ports and coast guards of EU Member States. These ports and coast guards are bound to give

69 See Articles 6 and 7 SRR.

effect to EU law, of which the said requirement would be part. Furthermore, since the port or coast guard can easily verify from the online database of the Ship Recycling Agency whether a licence was issued to the ship, this does not pose too heavy an administrative burden. Furthermore, over time the Ship Recycling Licence requirement needs to be integrated into Port State Control as exercised by EU Member States under the Paris Memorandum of Understanding (MOU), the Port State Control Directive 2009/16/EC and into the Thetis information system as developed by EMSA.

With regard to the implementation timeline, it seems advisable to adopt a timeline that starts not earlier than that under article 32 (2) (b) SRR for the requirement of an Inventory of Hazardous Materials (IHM) that also applies to non-EU flagged ships, i.e. 31 December 2020. This would allow time for the legislative process at the EU level to be completed for the setting up of a Ship Recycling Agency or the tasking of an existing Agency with the implementation of the Ship Recycling Licence, and finally for the shipping industry to adapt to this new regulatory requirement.

It seems at this stage unnecessary to set requirements for private savings mechanisms that in the future may be considered for authorisation by the European Commission as an alternative for the public system of contributions and credits to a future payment under a ship recycling fund. If it is deemed desirable that the European Commission would have the power in the future to pass implementing acts to this effect, it will be sufficient to provide so in the draft-regulation. This would have the major advantage that the implementation of the Ship Recycling Licence is not delayed by the technicalities involved in defining the minimum requirements that such a private mechanism and its providers should fulfil. Nor does it depend on the setting up of monitoring systems and tasking financial regulators to monitor these private mechanisms and their providers.

Although the present recommendations are not specifically geared towards smaller sized ships currently excluded from the scope of SRR[70], it is believed that the proposed ship recycling licence is neutral towards a possible future inclusion of also these smaller ships in the scope of the SRR. Neutral, because if the ship recycling licence were to become applicable to smaller sized ships as well, this would not lead to disproportional financial consequences. Like bigger sized ships, small sized ships would be able to apply for a Ship Recycling Licence with a duration that fits the frequency of their calling at EU ports. Similarly the capital amount to be accumulated would be relative to the ship's size and revenue gap.

If and when at a future moment the Hong Kong Convention (HKC) were to come into force, the proposed Ship Recycling Licence would not lose its relevance as a financial instrument to facilitate safe and sound ship recycling, since the HKC has the same vulnerabilities as the current SRR. Its effect would be limited to the States Party of the HKC and therefore would not prevent the timely reflagging of a ship to the flag of a state not party to the HKC or the SRR. Rather than phasing out the Ship Recycling Licence it may deserve further consideration to propose at the international level (IMO) the adoption of a similar instrument with global effect.

70 Under Article 2 (2)(b) SRR ships of less than 500 gross tonnage (GT) are excluded from the SRR's scope.

Reviews and updates over time

Once the mechanism of the financial instrument becomes effective, monitoring of its operational implications and its effectiveness will be necessary. Besides the evaluation requirements that are part of the regulation itself, it is recommended to include:

- a regular review of the revenue gap between sound and unsound recycling, say every five years, to review the validity of the revenue gap levels and to benefit from more detailed information obtained from yards reviewed for acceding to the EU list. A procedure for this review is proposed below;
- calibration of the forecast model benefiting from the actual behaviour of ship owners observed. This task could be part of the fund management.

A proposal on how to evaluate the revenue gap for environmentally sound ship recycling

As mentioned, to ensure proper alignment of the capital accumulation with the actual revenue gap, the estimated revenue gap needs to be evaluated at least country-wise as investments and operational cost differences do occur. To this end, once applications for the European List are being assessed, data becomes available that can be used for this purpose. The scheme of evaluation can follow the structure as shown in section 3.5 presenting the example of a typical Turkish scrapping yard.

The ship-wise incentive that the financial instrument tries to promote for now should be based on the LDT of a certain ship, whereas investments and operational costs of a recycling yard are mainly fixed and need to be related to their recycling throughput per period (year). For the latter, verification with historical volumes is recommended.

LDT is a value that is officially stated in ship certificates in a high accuracy (loading manual / -instrument) and therefore can be easily verified.

Once the volume of sound recycling starts to increase (as a result of the financial instrument), it is expected that in a developed competition, recycling facilities will possibly specialize to ship certain types and sizes, and a more refined estimation of the revenue gap by type and size becomes relevant (and possible).

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ANNEX A: LEGAL ANALYSIS OF A WASTE DISPOSAL FEE

Introduction

To assess the possibility of transposing aspects of the legal concept of a waste disposal fee into a financial instrument to support sound Ship Recycling, this annex gives a brief oversight of the objectives, principles and legal basis of EU waste regulation. For the sake of clarity, only the most significant directives and specifics of the directives are addressed.

The objectives of the EU waste legislation are (i) to preserve, protect and improve the quality of the environment (ii) to protect human health (iii) to utilise natural resources prudently and rationally and (iv) to promote re-use and recycling over recovery or landfill of waste.

Principles adopted by EU waste regulation include (i) the precautionary principle (ii) the preventive principle (iii) the principle that environmental damage should be rectified at the source (iv) the polluter pays principle (v) producer responsibility and (vi) the principle of subsidiarity.

The legal framework

Waste management is covered by EU legislation in the field of environment, as such article 174 jo. 175 of the Treaty on the function of the EU is the legal basis for the directives on handling of waste. Additionally, article 95(1) supports measures at Community level to ensure the smooth functioning of the internal market and avoid distortion of competition with the Community.

EU Member States are allowed to go beyond the directives' requirements and maintain or adopt stricter measures at national level. Those measures must be compatible with the requirements of the EC Treaty (for example free movement of goods).

The objective of the directives, as such the protection of the environment and human health, should by reasons of the scale of effects of the directive(s), be achieved at Community level.[71]

Handling of waste

Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste: establishes the legislative framework for the handling of waste in the EU.

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives repeals directive 2006/12/EC and clarifies key concepts such as the definitions of waste, recovery and disposal, to strengthen the measures that must be taken in regard to waste prevention, to introduce an approach that takes into account the whole life-cycle of products and to focus on reducing the environmental impacts of waste generation and waste management, thereby strengthening the economic value of waste.[72]

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71 Directive 2008/98/EC, preamble (49).
72 Ibidem, preamble (8).

End of life vehicles

Directive 2000/53/EC on end-of life vehicles aims to support reusing, recycling and other forms of recovery of end-of life vehicles and their components as to reduce the disposal of waste, as well as at the improvement in the environmental performance of all the economic operators involved in the life cycle of vehicles and especially the operators directly involved in the treatment of end-of life vehicles.[73]

The directive does not state how the costs of treatment should be met. However, it requires producers to pay all or a significant part of the costs of take-back and treatment from 2007 onwards.[74] Contrary to the directives 2006/66/EC on batteries and accumulators and 2012/19/EU on electrical and electronic equipment waste, it is not stated that the basic principle for financing should be set at Community level.

Batteries and accumulators

Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC prohibits the placing on the market of batteries and accumulator containing certain hazardous materials and promotes collection and recycling of waste batteries and accumulators, as well as improved environmental performance of operators involved in the life cycle of batteries and accumulators.[75]

The directive lays down the basic principles for financing the management of waste batteries and accumulators should be set at Community level.[76] Inherent to the concept of producers' responsibility, producers are responsible for financing the waste management.[77] Specifics on how to structure this financial responsibility are for the Member States to determine. Member States may use economic instruments to promote the collection of waste batteries and accumulators or to promote the use of batteries and accumulators containing less polluting substances, for instance by adopting differential tax rates.[78]

Electronic waste

Directive 2012/19/EU of the European Parliament and of the council of 4 July 2012 on waste electrical and electronic equipment (WEEE) regulates collection, treatment, recycling and disposal of waste from electrical and electronic equipment.

Similar to directive 2006/66/EC on batteries and accumulators, producers are responsible for financing the waste management. A producer can choose to do this either individually or by joining a collective scheme. Differentiated fees based on how easily products can be recycled are allowed at such a collective scheme.[79] Note that contrary to the directive on batteries and accumulators, the term 'fee' is used instead of 'tax'. In addition, producers must provide financial guarantees to prevent costs from orphan products.[80] The management of historical waste has to be financed through a collective financing scheme.

Member States must encourage producers to take full responsibility for the WEEE collection in order to (i) avoid separately-collected WEEE becoming the object of suboptimal treatment and illegal exports, (ii) to create a level playing field by

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73 Directive 2000/53/EC, article 1.
74 Ibidem, article 5(2) js. 5(4), 10(1) & 10(3).
75 Directive 2006/66/EC, preamble (5).
76 Ibidem, preamble (19).
77 Ibidem, article 16.
78 Ibidem, article 9.
79 Directive 2012/19/EC, preambule (23), article 12 & 13.
80 Ibidem, article 12(3).

harmonising producer financing across the Union and (iii) to shift payment for the collection of this waste from general tax payers to the consumers of EEE, in line with the 'polluter pays' principle.[81]

Similarly to the directive on batteries and accumulators, the basic principles for financing the management of WEEE should be set at Community level.[82] However, Member States have adopted different approaches to the operative and financial structures. Based on the framework as introduced by Federico Magalini and Jaco Huisman, insights can be gained about the different cost models:

- Compliance Cost: Producers finance activities in the system, bearing costs for management of all WEEE, both Historical and New (joining a compliance scheme or financing their own take back system);
- Compliance Cost & Visible Fee: Producers finance activities in the system, bearing costs for management of New WEEE (joining a compliance scheme or financing their own take back system). They also bear costs for management of Historical WEEE but they use a Visible Fee to get money back from Final Users in respect of Historical WEEE management costs;
- Reimbursed Compliance Cost: Producers finance activities in the system, bearing costs for management of WEEE (joining a compliance scheme or financing their own take back system). They also bear costs for management of Historical WEEE but they use a Visible Fee to get money back from Final Users in respect of both Historical & New WEEE management costs;
- Recycling Fee (RF): Final Users, when buying new equipment, bear costs for management of WEEE. There's no involvement of Producers. Recycling Fee could be used to raise funds for future treatment of appliances currently being sold.[83]

Concluding

- The basic principles for financing waste management are set at community level. The competence of the European Parliament and of the Council is based on article 175 of the Treaty. Producers are responsible for financing the costs of waste management. The Member States must ensure that producers live up to this responsibility. As such, the Member State authorities set the preconditions following from the EU directives. The operative and financial structure of waste management differs per Member State and per type of product. As for end-of life vehicles, batteries, accumulators and electrical and electronic equipment waste, the industry mostly has arranged their own waste management structure. The producers pass their costs on to the consumers through a waste management fee. This waste disposal fee may be visible to the consumer.

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81 Ibidem, preamble (23).
82 Ibidem, preamble (22).
83 Magalini, F., and Huisman J. (2007), 'Management of WEEE & Cost Models across the EU Could the EPR principle lead US to a better Environmental Policy?' Electronics & the Environment, Proceedings of the 2007 IEEE International Symposium.

ANNEX B: WTO COMPLIANCE

Introducing a financial instrument that applies to EU flagged ships only might create tensions with existing international WTO regulation, in particular regulation based on the principle of non-discrimination. This is primarily the case if a financial instrument is created which would benefit only EU ship owners (e.g. by being able to receive payments from a fund which are not fully reflecting the contributions made by that ship owner to the fund, and hence can be interpreted as a subsidy). As Profundo 2013 describes: "*If the disbursement of the fund only concerns EU ship owners, meanwhile the fee is levied from all sorts of ships, EU and non-EU, the fund could be considered as contrary to the non-discrimination principle.*"

A regulation imposing a financial contribution on non-EU companies was held to be lawful by the European Court of Justice in a decision of 21 December 2011 (Case 366/10) on the obligation of non-EU aviation companies to pay for the emission of greenhouse gas under the ETS.

This aspect should also be incorporated in a system which uses EU ports of call as the main design factor, provided that the monies which are built up not only benefit EU-flagged ships, but are equally accessible to all ships that have contributed to the financial instrument.

In the case of an instrument applying to all ships calling at EU ports, WTO compliance also needs to be considered.

A critical aspect in relation to the introduction of a financial instrument is whether the creation of a new financial obligation accords with the existing commitments of the European Union and its member states under the General Agreement on Tariffs and Trade (GATT 1994) and the General Agreement on Trade in Services (GATS) in the context of the World Trade Organisation (WTO).

General Agreement on Tariffs and Trade (GATT) 1994

Relevant substantive provisions under GATT 1994 include "Freedom of Transit" in Article V and "Non-discrimination" under Articles I and III. Even if a proposed financial instrument constitutes a violation of one of the said substantive provisions, it may be that the measure is justifiable pursuant to the general exceptions defined in Article XX (a) (b) and (g) GATT necessary for the protection of public morals, human health and the environment. Below these provisions and their relevance will be discussed in more detail.

Article V Freedom of Transit

The concept "traffic in transit" as defined in Article V:1 GATT 1994 has a broad scope of application. It refers to all goods (including vessels and other means of transport) passing through a country, without that country being the last destination.[84] Next, in Article V:2 the principle of freedom of transit is established and it is expressly provided that no distinctions shall be made on the basis of the flag or the origin of the goods/vessels.[85] It is clear that a financial instrument as explored in this report affects

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84 *Article V:1 reads as follows: "Goods (including baggage), and also vessels and other means of transport, shall be deemed to be in transit across the territory of a contracting party when the passage across such territory, with or without trans-shipment, warehousing, breaking bulk, or change in the mode of transport, is only a portion of a complete journey beginning and terminating beyond the frontier of the contracting party across whose territory the traffic passes. Traffic of this nature is termed in this article "traffic in transit"."*

85 *Article V:2 reads as follows: "There shall be freedom of transit through the territory of each contracting party, via the routes most convenient for international transit, for traffic in transit to or from the territory of other contracting parties. No distinction shall be made which is based on the flag of vessels, the place of origin, departure, entry, exit or destination, or on any circumstances relating to the ownership of goods, of vessels or of other means of transport."*

"traffic in transit" and might interfere with the "freedom of transit" even if it does not differentiate between ships based upon their flag.

Article V:3 prohibits unnecessary restrictions on traffic in transit and provides that it shall be exempt from "all transit duties or other charges imposed in respect of transit, except charges for transportation or those commensurate with administrative expenses entailed by transit or with the cost of services rendered." In the absence of case law interpreting this provision, it remains speculative to draw conclusions concerning its open-ended wording.

Arguably, a proposed financial instrument may violate Article V:3 if it is deemed to constitute an unnecessary restriction to traffic in transit. However, it could equally be argued that this restriction on traffic in transit is necessary, because without it the EU cannot effectively implement its public policies on safe and sound[86] ship recycling practices and the "polluter pays principle".[87] As discussed above in section 2.7, other possible measures are not effective in this regard because of the possibility of flagging out and the common practice that the ownership in a ship is transferred several times during the ship's life span. Some support for this approach might be found in Article III:4, 2nd sentence GATT 1994, which permits "the application of differential internal transportation charges based exclusively on the economic operation of the means of transport (…)". If so, the EU regime would appear consistent with Article V:3.

Article V:3 further gives rise to the question whether the proposed financial instrument imposes a charge, since this provision prohibits "all transit duties or other charges" other than administrative charges and retributions for services rendered. Although the term "charge" has not been interpreted in the context of Article V:3, it should be noted that the term "duties and other charges" has been interpreted in a rather broad manner in relation to Article II:1(b) GATT 1994.[88] To the extent that the financial instruments require contributions which give rise to entitlements to future payments, the nature of the sum demanded seems closer to a premium than to a charge. However, since all accrued rights to a future payment shall be forfeited if the ultimate ship owner decides to have the ship dismantled at a ship yard not included in the European List of ship recycling facilities, it could also be argued that in fact the financial instruments impose a charge. In conclusion, in order to ensure that a financial instrument complies with Article V:3, it is important that the contributions to the capital amount accumulated have the nature of a premium rather than of a charge. The possibility that accrued rights are forfeited as a penalty remains a problematic feature of the financial instrument vis-à-vis Article V:3.

Article V:4 specifies that: "All charges and regulations imposed by contracting parties on traffic in transit (…) shall be reasonable, having regard to the conditions of the traffic." This provision is clearly relevant, as it refers to both charges and regulations. This implies that the Financial instrument, whether or not it should be construed as a charge or a regulation, must pass the reasonableness-test of Article V:4 GATT 1994. There remains some ambiguity as to the exact meaning of the term "reasonable", in particular because there is no benchmark against which the "reasonableness" of a measure could be assessed. Arguably, where different alternatives are available, it seems reasonable to adopt the one, which on balance imposes the least costs on traffic in transit. Accordingly, of the available options, the one with least costs to the ship owner would appear to be the most reasonable option to implement. Showing

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86 See Recital (7) Preamble and Art. 1 SRR: "The purpose of this Regulation is to prevent, reduce, minimise and, to the extent practicable, eliminate accidents, injuries and other adverse effects on human health and the environment caused by ship recycling. The purpose of this Regulation is to enhance safety, the protection of human health and of the Union marine environment throughout a ship's life-cycle, in particular to ensure that hazardous waste from such ship recycling is subject to environmentally sound management."

87 See Recital (19) of the Preamble to the SRR and Article 29 SRR.

88 Panel Report, Dominican Republic — Measures Affecting the Importation and Internal Sale of Cigarettes, WT/DS302/R, adopted 19 May 2005, as modified by the Appellate body Report WT/DS302/AB/R, DSR 2005:XV, 7425, paras. 7.113–114.

that alternative measures, vis-à-vis the financial instrument, are not capable to achieve the legitimate goals underpinning the SRR, can also be used to argue that the financial instrument is reasonable.

Finally, in Article V:5 the Most Favoured Nation (MFN) principle is extended to traffic in transit.[89] This provision establishes that "With respect to all charges, regulations and formalities in connection with transit, each contracting party shall accord to traffic in transit to or from the territory of any other contracting party treatment no less favourable than the treatment accorded to traffic in transit to or from any third country."

At face value, the proposed financial instruments appear to be origin neutral or non-discriminatory and thus in compliance with Article V:5. However, based upon a consolidated jurisprudence in the context of Articles I and III GATT 1994 (see below), the analysis of non-discrimination should not be limited to *de jure*, but should also cover *de facto* discrimination. Here, the question rises whether the fact that the accrued rights can be forfeited by way of a penalty, is more advantageous to the (majority of the group of) ship owners of one or more countries (those that will receive the amount upon sound recycling of the ship) than to the (majority of the group of) ship owners of other countries. This analysis can be done only on the basis of empirical data that is not available at present.

However, even if such analysis was possible and did result in an affirmative answer, different effects on groups of products originating from different countries is not the only consideration to establish the existence of "less favourable" treatment. As further discussed below[90], the WTO Appellate Body has stressed that 'the existence of a detrimental effect on a given imported product resulting from a measure does not necessarily imply that this measure accords less favourable treatment to imports if the detrimental effect is explained by factors or circumstances unrelated to the foreignorigin of the product'.[91] According to Professor JoostPauwelyn this line of jurisprudence signals the return of an improved "aim-and-effects" test, according to which also the intent of the measure is to be appraised in the evaluation of non-discrimination.[92] Pursuant to this way of interpreting GATT, a proposed financial instrument may be more easily found in compliance with Article V:5.

Trade Facilitation Agreement

Article V has been further clarified and improved by the Trade Facilitation Agreement, concluded in December 2013 and adopted on 27 November 2014.[93] The Trade Facilitation Agreement will come into force once two-thirds of the WTO Members have accepted the Protocol of Amendment.[94] At present, 17 Members have accepted the Agreement. Article 11 of the Trade Facilitation Agreement does clarify Article V and

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89 *According to the Panel in Colombia — Ports of Entry, 'Article V:5 extends MFN protection to 'traffic in transit' '[w]ith respect to all charges, regulations and formalities in connection with transit'). In accordance with the Ad Note to this provision, MFN protection extends to 'like products being transported on the same route under like conditions' in relation to transportation charges. Setting aside transportation charges, the protection under Article V:5 broadly extends to all regulations and formalities for all 'traffic in transit'. Cfr. Panel Report, Colombia – Indicative Prices and Restrictions on Ports of Entry, WT/DS366/R, paras 7.468.*

90 *See below the section on Non-discrimination under Articles I and III GATT 1994.*

91 *Such as the market share of the importer in this particular case. In this case, the mere demonstration that the per-unit cost of the bond requirement for imported cigarettes was higher than for some domestic cigarettes during a particular period is not, in our view, sufficient to establish "less favourable treatment" under Article III:4 of the GATT 1994. (Complete).*

92 *Pauwelyn, J THE UNBEARABLE LIGHTNESS OF LIKENESS, A Review of MireilleCossy, Some Thoughts on The Concept of 'Likeness' in the GATS, WTO Staff Working Paper ERSD-2006-08, September 2006. (COMPLETE CITATION); see also Cossy, M 2006, Some Thoughts on The Concept of 'Likeness' in the GATS, WTO Staff Working Paper ERSD-2006-08, September 2006.*

93 *The Agreement has been adopted as a Protocol of Amendment to be inserted into Annex 1A of the WTO Agreement. At the time of writing, the European Union has not yet accepted the Protocol of Agreement.*

94 *Protocol Amending the Marrakesh Agreement Establishing the World Trade Organization, Decision of 27 November 2014, WT/L/940.*

VIII GATT 1994 and it is accordingly relevant for the analysis of compatibility of the Financial Instrument. Given that the Agreement has not yet entered into force, this Report does not address profiles of compatibility with this Agreement.

Articles I and III: Non-Discrimination

GATT applies to trade in goods, and requires that there be no discrimination between foreign products originating from two or more countries[95], nor between products of domestic and foreign origins[96] and finally it prohibits quantitative restrictions.[97] This raises the threshold question pertaining to the scope of application of Articles I and III, given that both articles addresses trade in goods: can vessels be considered "imported/export products"? This question was addressed by the WTO Panel in the case *European Communities – Measures Affecting Trade in Commercial Vessels* in relation to the application of Article III:4[98]:

"In the view of the Panel, in order to find in a particular case that Article III:4 does not apply because the products in question are not "imported products", it would be necessary to establish that importation of those products is inherently impossible. While the Panel realizes that most ships entering the European Communities carrying goods are in transit and are not formally imported, that does not preclude the possibility of a ship being imported. In this regard, the Panel agrees with Korea that a distinction can be made between entry as part of normal commercial operations and entry at the time of the initial delivery of a vessel. The fact that Article V of the GATT 1994 obligates Members to accord vessels freedom of transit across their territories does not establish that such vessels cannot be imported into the territory of a Member. (…)."[99]

Accordingly, it is possible to conceive of measures affecting trade in vessels. The assessment of whether a financial instrument may affect trade in vessels is of a factual nature and should be based on empirical data that is not available at present. Even if the proposed financial instruments fall outside the scope of application of Articles I and III GATT, it is worthwhile to explore briefly in what ways a financial instrument may violate these provisions.

It is well established, that the core provisions of GATT 1994 apply both to *de jure* and *de facto* discrimination.[100] As the proposed financial instruments apply to both EU and non-EU flagged ships, it seems that at least the element of direct discrimination is avoided. Nevertheless, the practical implications of the financial instruments regime are more difficult to foresee or estimate. Clearly, the financial instrument does not discriminate directly against foreign products, However, it should be considered whether the financial instrument once in force may have an indirect discriminatory effect, in the sense that it interferes with certain trade patterns and competitive relationships concerning like products.

Take for example the owner of a non-EU flagged ship, who, over the years, has accrued rights to the payment of a capital amount by making contributions in return for a Ship Recycling Licence (SRL) to call at European ports. If, for some reason the ship owner decides to dismantle his ship at a ship not included in the European List, the accrued rights to the accumulated funds are forfeited. Is it conceivable to postulate, that since the ship owner did not get any service in return for its contributions, this is a kind of *indirect* taxation, that might possibly affect the equality

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95 This follows from the Most Favoured Nation (MFN) Rule in Article I GATT 1994.
96 This follows from the "National Treatment" rule in Article III GATT 1994.
97 See Article XI which has only very few exceptions.
98 Panel Report, European Communities – Measures Affecting Trade in Commercial Vessels, WT/DS301/R, adopted 20 June 2005, DSR 2005:XV, 7713.
99 Ibidem, Para. 7.63.
100 See for instance, Panel Report, Canada – Patent Protection of Pharmaceutical Products, WT/DS114/R, adopted 7 April 2000, DSR 2000:V, 2289, at para. 7.101.

of competitive conditions of a foreign product (the vessel) towards a domestic product (an EU-flagged vessel)?

As mentioned above, when it comes to non-discrimination, WTO rules require not only that a measure is *de jure* (as a matter of law) non-discriminatory but also *de facto* (in fact) so. Accordingly, much will depend on how a measure operates and what its effects are in practice rather than on paper. In the event that it can be proved that, the financial instrument jeopardizes the equality of competitive conditions of specific products of foreign origin towards domestic products, it will most likely be in violation of one of the core provisions of GATT 1994 as mentioned above. The WTO Appellate Body has emphasized the importance of the effects of a measure on the group of imported products vis-à-vis the group of domestic products.[101] If it is assumed, that after the introduction of the financial instrument most non-EU flagged vessels would be dismantled in facilities not included in the European list, whereas most EU flagged would dismantle in facilities included in the European list, this may indicate that there is a violation of Article III:4. The Appellate Body has also emphasized that disparate effects on foreign products are not per se determinative of non discrimination. Other circumstances should be weighted-in as well.[102]

One commentator has argued that 'One way of making sense of this test … is to read it as a qualification of the test as stated in *EC–Asbestos*, such that even if a measure has a disproportionately detrimental impact on imported products, this does not matter if, in principle, it could have the same impact on domestic products; or if the importer is reasonably able to meet the conditions of more favourable treatment.'[103] Following this reasoning, we may pose the following question: Even if some foreign vessels would be mainly negatively affected by the implementation of a financial instrument, would these importers 'be reasonably able to meet the conditions for more favourable treatment'?

Ultimately, the question whether a financial instrument is non-discriminatory, is to be answered in the light of in-depth empirical data about the market for vessels, which are not available at present. As mentioned above[104], the evolution of the jurisprudence on the National Treatment has led one authoritative scholar to conclude that the main benchmark followed is an improved aim-and-effect test, according to which both the effects and the intents of the measure are to be assessed.[105] This may mean that even if the effects of a financial instrument would be negatively affecting mainly foreign products, the Financial Instrument could still be found non-discriminatory in view of the non-discriminatory intent of the measure.

General Exceptions under Article XX GATT 1994

Even if a financial instrument is found to be in violation of one or more of the substantive provisions of GATT 1994 as discussed above, the measure may still be justifiable under its Article XX, which establishes the general exceptions in the GATT. According to this provision, in particular its subsections (a), (b) and (g), WTO Members should not be prevented by GATT from pursuing their social and environmental policies. As mentioned above[106], the proposed financial instrument is clearly aimed at the protection of the environment, human health and possibly even public morals (in the sense of protection of human rights). The relevant parts of Article XX GATT read as follows:

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101 Appellate Body Report on Chile – Taxes on Alcoholic Beverages, WT/DS87/AB/R, adopted on 12 January 2000.

102 Appellate Body Report, Dominican Republic – Measures Affecting the Importation and internal Sale of Cigarettes, WT/DS302/AB/R, adopted 19 May 2005, DSR 2005:XV, 7367, para. 96.

103 Bartels, L. 'Trade and Human Rights', in The Oxford Handbook of International Trade Law, Oxford University Press, 2009, pp. 572-596, at p. 587.

104 See above the section on Article V GATT.

105 Pauwelyn, J THE UNBEARABLE LIGHTNESS OF LIKENESS, A Review of MireilleCossy, Some Thoughts on The Concept of 'Likeness' in the GATS, WTO Staff Working Paper ERSD-2006-08, September 2006.

106 See above § 2.3, under 1. Relation with the public policy objectives of the SRR.

"Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures:

(a) necessary to protect public morals;
(b) necessary to protect human, animal or plant life or health; …
(*g*) relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption;'

In interpreting Article XX GATT 1994 (or its counterpart Article XIV GATS), the Appellate Body has consistently stressed that there is a logical order that needs to be followed in concrete cases.[107] It has developed a two-prong test.[108] First, it needs to be checked whether the measure is necessary or related to the protection of the policy goals listed in the letters of the Article (i.e. protection of the environment, public health or public morals). Secondly the measure needs to be tested against the so-called chapeau of the Article, which deals with the arbitrary and unjustifiably discriminatory nature of the measure. Below the relevant exceptions of Article XX will be discussed in reversed alphabetical order.

"Measures … ***(g) relating to the conservation of exhaustible natural resources …".***

The main goal of the financial instrument is to facilitate safe and sound ship recycling. The existing conditions under which ship recycling occurs create serious environmental damage.[109] According to World Bank estimates, between 2010-30, large amounts of asbestos, PCB, Ozone Depleting Substances and heavy metals will be discharged in the environment, due to poor dismantling conditions in countries like Bangladesh and Pakistan.[110] Considering that the substances mentioned would pollute the marine environment (due to the practice of beaching) and the air, and further would contribute to the loss of biodiversity, and given the fact that WTO Appellate Body has interpreted the concept of "exhaustible natural resources" rather progressively[111], it is safe to assume that (at least some of the) resources damaged do qualify as exhaustible natural resources in the sense of Article XX (g) GATT 1994.

Moreover, the requirement that needs to be fulfilled is that the measure is "relating to" the protection of the natural resources. "Relating to"' has been equated to (being) "primarily aimed at". Clearly, the financial instrument is primarily aimed at the protection of these resources. However, a potential challenge to the measure is that it applies also to territories outside the EU. Although the WTO Appellate Body has been somewhat ambiguous as to the legality of measures with extra-territorial effect[112], it has concluded that extra-territorial measures are allowed, as long as there is a

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107 Appellate Body Report, United States – Import Prohibition of Certain Shrimp and Shrimp Products, WT/DS58/AB/R, adopted 6 November 1998, DSR 1998:VII, 2755 (US – Shrimp).

108 US – Gasoline, p. 22.

109 See above § 1.1.

110 In the Impact Assessment to the EU proposal for the SRR, we read: 'According to estimates from the World Bank, more than 80 000 tons of asbestos, 256 000 tons of PCB, 224 000 tons of Ozone Depleting Substances (ODS) and around 74 000 tons of heavy metals are expected to be sent in ships for dismantling to Bangladesh and Pakistan over 2010-2030. Since there are no formal waste disposal sites in these countries, the waste mainly remain in the facilities and pollutes the water, the beach sediments, the soil of the seashore and coastal habitats'. IMPACT ASSESSMENT, Accompanying the document Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on ship recycling, Brussels, 23.3.2012, SWD(2012) 47 final, p. 12.

111 Appellate Body Report, US – Shrimp, paras. 128-130.

112 The Appellate Body in US - Shrimp has stated: 'We do not pass upon the question of whether there is an implied jurisdictional limitation in Article XX (g), and if so, the nature or extent of that limitation. We note only that in the specific circumstances of the case before us, there is a sufficient nexus between the migratory and endangered marine populations involved and the United States for purposes of Article XX(g).' para. 133.

"sufficient nexus" between the measure and the national interest protected.[113] Clearly the sea, the air and biodiversity belong to the category of global commons, which means that there is a sufficient nexus between the measure and the national interest protected. Against this background, the financial instrument is likely to be found in compliance with the letter (g) of Article XX, as the measure unequivocally relates to exhaustible natural resources.

"Measures … ***(b) necessary to protect human, animal or plant life or health"***

Arguably, the financial instrument could further be defended on the basis of Article XX (b). Taking into account that the effects of unsafe and environmentally unsound recycling practices pose a future risk to animal, plant and human life, Article XX (b) may apply. However, for a number of reasons, it may prove more difficult to defend a financial instrument under Article XX (b). First, the test under Article XX (b) is more stringent, as it demands that the measure is "necessary" to protect the public policy objective. The WTO Appellate Body has interpreted this term as implying that there should be a process of weighing and balancing interests, by which the more important the interest protected is, the more stringent the measure taken can be.[114] Most importantly however, it may prove difficult to defend a financial instrument under letter (b) because of its extra-territorial effects. Whereas under letter (g) it may be relatively easy to establish the required link, the same is not true under letter (b). However, since the measure, as far as it relates to the protection of the environment and as discussed above, can be defended under letter (g), this is not a problem.

"Measures … ***(a) "necessary to protect public morals"***

A remaining problem is that the sound and safe recycling of ships aims also at protecting the life and health of human beings employed for the dismantling of the ship.[115] This implies that in part, the financial instrument can also be defended based on the public morals exception in Article XX (a) GATT 1994.[116] It can be argued that unsafe ship recycling practices violate basic human rights, because adults as well as children are employed under very poor working conditions, are exposed to hazardous substances such as asbestos, that pose serious threats to their health. Given these dramatic working conditions and the fact that human rights are clearly violated, it can be argued that the financial instrument is necessary to protect the public morals of Europeans. It should be added that, when human rights are being violated, scholars tend to concur that the public morals exception of Article XX (a) can be applied.[117] However, when it comes to more developed forms of labour rights, opinions are more divided.[118] Accordingly, a financial instrument as a necessary measure to render the

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113 US – Shrimp, para. 133

114 Brazil – Retreaded Tyres: Appellate Body Report, Brazil – Measures Affecting Imports of Retreaded Tyres, WT/DS332/AB/R, adopted 17 December 2007 and Appellate Body Report, Korea – Measures Affecting Imports of Fresh, Chilled and Frozen Beef, WT/DS161/AB/R, WT/DS169/AB/R, adopted 10 January 2001, DSR 2001:I, 5.

115 For an assessment of mortality and morbidity risks, see Impact Assessment (2012), quoted above.

116 China – Audiovisual products (DS363); US-Gambling (Article XIV(a) GATS).

117 Pauwelyn, J (2003), WTO Compassion or Superiority Complex?: What to Make of the WTO Waiver for 'Conflict Diamonds'. Michigan Journal of International Law 24.4 (2003): 1177-1207, Trebilcock, Michael (2001), Trade Policy and Labour Standards: Objectives, Instruments, and Institution http://papers.ssrn.com/sol3/papers.cfm?abstract_id=307219 Chartres, Renee L. and Mercurio, Bryan Christopher, A Call for an Agreement on Trade-Related Aspects of Labor: Why and How the WTO Should Play a Role in Upholding Core Labor Standards (May 23, 2012). North Carolina Journal of International Law and Commercial Regulation, Vol. 37, pp. 665-724, 2012. Available at SSRN: http://ssrn.com/ abstract=2065621; Barry, Christian and Reddy, Sanjay G., International Trade and Labor Standards: A Proposal for Linkage. Cornell International Law Journal, Vol. 39, p. 545.

118 Brown, Drusilla K., Deardorff, Alan V. and Stern, Robert M., "Trade and Labor Standards" (1997). University of Michigan WP 394. http://ssrn.com/abstract=54042. For an overview of the arguments, see Trebilcok, above. It should also be noted that there is an emerging global consensus about corporate responsibility to respect human rights which naturally extends also to ship-owning companies and ship recycling facilities. "Guiding Principles on Business and Human Rights, Implementing the United Nations "Protect, Respect and Remedy" Framework", Developed by the Special Representative of the Secretary-General on the issue of human rights

SRR effective, is more defendable if it aims at the protection of human rights, that are violated in case of unsafe and unsound ship recycling practices.

The chapeau of Article XX

Finally, the ultimate test follows from the chapeau of Article XX i.e. any existing discrimination shall not be unjustified or arbitrary in nature. This requirement has been interpreted as to refer to the way the measure is applied. In practice, this means that measures should be not be "rigid" and "inflexible".[119] Among the various alternatives for a financial instrument, the combination option can offer more flexibility and in that sense should be privileged. More generally, it should be noted that the financial instrument is tied with the system already established by the SRR regime and cannot be assessed in clinical isolation. In this context, the way by which ship-recycling facilities are accredited for inclusion in the European List will prove to be crucial. The WTO Appellate Body has also stressed that consideration should also be given to the particular condition of the exporting Member.[120] This means that when designing the financial instrument, attention should be paid to the capacity of other Members to comply with this measure. Finally, it has also been established that good-faith efforts to negotiate multilateral treaties are an important indicator under the chapeau test.[121] In other words, measures negotiated multilaterally are preferred to unilateral measures. In this context, it should be emphasized that the financial instrument is a measure aimed at implementing and making effective the SRR regime, which in turn is nested in a series of international treaties, including the Hong Kong Convention and the more widely ratified Basel Convention.[122] From this perspective, the financial instrument could be seen as the offspring of a long process of international dialogue. At the same time, if considered in isolation, the WTO-legality of the proposed financial instrument could be strengthened, if the EU were to engage in multilateral negotiations to try to achieve a mutually acceptable form for the financial instrument.

General agreement on Trade in Services (GATS)

GATS applies to all measures affecting trade in services.[123] Based on the wording of Article I, the scope of application of GATS is rather broad. Clearly, a financial instrument could be seen as a measure affecting trade in services, such as maritime transport services (and in particular access to ports) and, more indirectly, also environmental services. Accordingly, it is necessary to establish the GATS-compatibility of a proposed financial instrument. GATS establishes different types of provisions: certain obligations[124] are of a general nature, whereas others[125] are relevant only in relation to specific commitments made by WTO Members on a voluntary basis. Below the WTO-compatibility of the proposed financial instruments is explored as to how these affect trade in maritime transport services and environmental services.

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and transnational corporations and other business enterprises and annexed to his final report to the Human Rights Council (A/HRC/17/31), which endorsed these Guiding Principles in its resolution 17/4 of 16 June 2011.

119 US- Shrimp & US-Shrimp Article 21.5 Malaysia.

120 Appellate Body Report, US – Shrimp, para. 177.

121 The Appellate Body in US-Shrimp Article 21.5 Malaysia stated that the Member imposing the environmental measures has to "provide all exporting countries 'similar opportunities to negotiate' an international agreement" and is "expected to make good faith efforts to reach international agreements that are comparable from one forum of negotiation to the other." Appellate Body Report, United States – Import Prohibition of Certain Shrimp and Shrimp Products – Recourse to Article 21.5 of the DSU by Malaysia, WT/DS58/AB/RW, adopted 21 November 2001, DSR 2001:XIII, 6481, para 122.

122 See above in § 1.3.

123 See Article I GATS.

124 Part II GATS.

125 Part III GATS.

Maritime Transport Services

By requiring that all ships calling at EU ports, irrespective of flag, should be part of the regulatory scheme of a proposed financial instrument, the proposed measure clearly affects maritime transport services. The Most-Favoured Nation (MFN) principle[126] is included in Part II, GATS and is of general application. Article II:1 GATS requires that any "advantage" accorded by a WTO Member to services or service providers of any other country must be accorded immediately and unconditionally to the like service or service provider of any other WTO member and it is applicable to all measures affecting trade in services.[127] Although Article II GATS is of general application, the WTO Members may opt to exempt certain services from this provision. In a Decision of the Council for Trade in Services of 3 July 1996,[128] it was held that Article II GATS does not apply to Maritime Transport Services.[129] Since furthermore, the EU has not made any relevant specific commitments in relation to Maritime Transport Services, it follows that even if a financial instrument were to affect Maritime Transport Services, the proposed measure would not raise major concerns under GATS.

However, some general provisions remain relevant for the implementation and design of a proposed financial instrument. In particular, Article III GATS establishes the general obligation of transparency, which includes the obligation to publish all measures affecting the operation of GATS. Also Article VI GATS on Domestic Regulation may be relevant when considering the design of a measure. Whereas certain paragraphs of this provision apply only if specific commitments were undertaken (and are thus irrelevant for Maritime Transport Services), its §2 appears to be of general application.[130]

Article VI:2 GATS requires WTO Members to establish a system of legal remedies and judicial review against administrative procedures that affect trade in services.[131] It is advisable that legal remedies are made available to parties affected by the proposed financial instrument.[132] As discussed above in § 2.3.8 one of the key design elements of any financial instrument is to provide a regulatory mechanism dealing with the release of the capital amount to the ultimate ship owner, as well as the forfeiture of accrued rights. Especially with regard to the latter, procedural safeguards and the possibility of judicial review are essential. If it is deemed that such legal remedies are already available under EU law, it is advisable that future documents accompanying

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126 See Art. II:1 GATS.

127 By virtue of Article I:1 GATS, Article II:1 GATS applies to all measures with an effect on trade in services.

128 Decision of the Council for Trade in Services of 3 July 1996, S/L/24. § 4 of the Decision reads as follows: "Article II of the GATS and the Annex on Article II Exemptions, including the requirement to list in the Annex any measures inconsistent with most-favoured-nation treatment that a Member will maintain, shall enter into force for international shipping, auxiliary services and access to and use of port facilities at the same time as the conclusion of the negotiations referred to in paragraph 1. During the course of negotiations the effects of the continued suspension of Article II will be kept under review by the Council for Trade in Services."

129 § 5 of the Decision limits the exemption, as it excludes the sectors where specific commitments have been undertaken. However, for the purposes of this analysis, this is not relevant because the European Union has only specific commitments in relation to the rental of vessels with crew within the maritime transport sector.

130 The question of whether Article VI:4 GATS is of general application remains somewhat controversial. For the argument in the affirmative, see. Panagiotis Delimatsis, Due Process and 'Good' Regulation Embedded in the GATS – Disciplining Regulatory Behaviour in Services Through Article VI of the GATS, J Int Economic Law (2007) 10 (1): 13-50.

131 Article VI:2 GATS reads as follows: "(a) Each Member shall maintain or institute as soon as practicable judicial, arbitral or administrative tribunals or procedures which provide, at the request of an affected service supplier, for the prompt review of, and where justified, appropriate remedies for, administrative decisions affecting trade in services. Where such procedures are not independent of the agency entrusted with the administrative decision concerned, the Member shall ensure that the procedures in fact provide for an objective and impartial review. (b) The provisions of subparagraph (a) shall not be construed to require a Member to institute such tribunals or procedures where this would be inconsistent with its constitutional structure or the nature of its legal system.' From this provision, it is clear that the legal remedies can take different forms."

132 Whereas Article VI:2 GATS has not been interpreted by Panels or the Appellate Body of the WTO, its corresponding Article X:3 GATT has been. See: the Panel Report in: European Communities–Selected Customs Matters (EC–Selected Customs Matters), WT/DS315/R, circulated 16 June 2006 and the Appellate Body Report, EC–Selected Customs Matters, WT/DS315/AB/R, circulated 13 November 2006.

the proposal of the financial instrument should explain the existence and nature of such remedies.

Environmental services

As mentioned above, the proposed financial instrument may also affect the supply of environmental services. It is quite possible that a proposed financial instrument would affect the services supplied to owners of EU-flagged ships who send their ships for recycling outside the EU and thus receive an environmental service outside the EU. Phrased in GATS-jargon, a case of Mode 2, consumption abroad.[133] Obviously, environmental services are particularly relevant for waste management. More specifically, the service of ship recycling could fall under a sub-category of environmental services called "refuse disposal services"[134], as well as under "metal waste and scrap recycling, on a fee or contractual basis"[135] in the United Nations Provisional Central Product Classification (CPC).

Arguably, a financial instrument adopted by the EU would accord an advantage to ship recycling facilities, who provide safe and sound ship recycling services in compliance with the SRR and are eligible for inclusion in the European list to the detriment of services and service providers of South-Asian countries, such as Bangladesh, India and Pakistan, to the extent that these engage in unsafe and unsound ship recycling practices under the SRR and are thus not eligible for inclusion in the European List.

In this case, Article II:1 GATS (no less favourable treatment) could apply to the proposed regime. Even if the regime is construed in such a way that ship-recycling facilities of different WTO Members are all treated equally, it could appear that in practice such facilities from less developed countries are likely to be affected in a disproportionate manner and thus discriminated against. It is plausible to postulate that a financial instrument adopted by the EU could have a disproportionate effect on services and service suppliers in certain countries. In particular, it is likely that ship recycling in Bangladesh, India and Pakistan, would be affected more than ship recycling in the developed countries.

Further, it may be arguable that the reasons for this situation are connected with the origin of the service. Clearly, there is a direct link to ship recycling practices in the said countries, which have caused concerns about safe working practices and about environmental soundness in general. For these reasons, it would seem that, with respect to Article II:1 GATS, there is a failure to accord an "advantage" to all "like services" and "service suppliers". It should be noted however that is merely a working hypothesis, which would have to be founded on empirical data that is not available at present.

Moreover, as discussed above already in the context of GATT, the benchmark to assess a violation of the prohibition of non-discrimination is not merely the existence of possibly disparate effects on WTO Members. It is also important to assess how the measure may alter the conditions of competition. In this context, it should be noted that the Bangladesh government has announced an intention to invest US$ 150 million to develop green ship recycling facilities.[136] This may suggest that the conditions are truly competitive and that in practice ship recycling facilities from less developed countries are not affected disproportionately by the regime. In that case, the measure would comply with Article II:1 GATS. Finally, it is arguable, by juxtaposing environmentally sound ship recycling and environmentally unsound ship recycling, that the two kinds of services are in reality not "like services" at all.

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133 There exist for modes of service supply under GATS: Mode 1, (Cross-border supply); Mode 2 (Consumption abroad); Mode 3 (Commercial presence) and Mode 4, (Presence of natural persons).
134 06.B with corresponding CPC number 9402.
135 CPC 88493.
136 See above § 1.4 under the heading Regulation 1257/2013 on Ship Recycling.

Unlike Article II:1 GATS, most of the other obligations under the GATS apply only to the extent that a WTO member has made specific commitments in relation to those services. Most schedules of commitments consist of sector-specific and horizontal sections. The entries in the "horizontal" section apply across all sectors listed in the schedule of commitments. The "sector-specific" sections apply only to the particular service. Therefore, when analysing the schedules of commitments undertaken, it is necessary to take into account also the horizontal commitments in order to understand the full range of commitments taken. The table below shows the EU sector-specific commitments on "refuse disposal services":

- 6 ENVIRONMENTAL SERVICES

Mode of Supply : 1) Cross-border supply 2) Consumption Abroad 3) Commercial presence 4) Presence of natural persons

European Union

6 ENVIRONMENTAL SERVICES

6.B Refuse disposal services

B. Refuse Disposal Services
(CPC 9402)

	Limitations on Market Access		Limitations on National Treatment
1)	Unbound*	1)	Unbound*
2)	None	2)	None
3)	None	3)	None
4)	Unbound except as indicated in the horizontal section	4)	Unbound except as indicated in the horizontal section

Source: WTO.

The above table lists EU schedules of commitments in "refuse disposal services". As follows from the table, the EU has made full commitments in Mode 2 (Consumption abroad) in the relevant service.[137] This means only that there is no restriction specific to that sector. Nevertheless, there could be relevant limitations in the "horizontal" section, which applies to all services. However, there are no EU commitments concerning "refuse disposal services" under Mode 2 (consumption abroad), that would somehow affect its full commitment in this sub-sector. Accordingly, the question arises whether a proposed EU regime could violate any obligations with respect to this service sector.

Pursuant to Article XVII:1 GATS[138], the EU is under the obligation to afford no less favourable treatment to 'like'[139] ship recycling services and service suppliers than "that it accords to its own like services and service suppliers". Furthermore, it is arguable that – contrary to Article XVII:3 GATS[140] – the proposed financial instrument could have the effect of modifying the conditions of competition in favour of EU services and service suppliers, compared to those of other WTO Members. Again, such a conclusion must be based on empirical data, that is not available at present. *Mutatis mutandis*, the analysis conducted above under Article II:1 GATS would be relevant to assess the compatibility of a financial instrument under Article XVII GATS.

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137 In the table, "none" indicates that there is no restriction placed on foreign providers. Hence, there is a full commitment on the part of the EU, with no limitations.

138 Article XVII:1 GATS reads as follows: "In the sectors inscribed in its Schedule, and subject to any conditions and qualifications set out therein, each Member shall accord to services and service suppliers of any other Member, in respect of all measures affecting the supply of services, treatment no less favourable than that it accords to its own like services and service suppliers.".

139 It must be noted that the concept "likeness" under the GATS may differ in comparison to the same under the GATT for the simple reason that they try to cope with an inherently distinct nature of their respective subject matter, where the former deals with trade in "services" while the later deals with trade in "goods". At the same time, as noted by Pauwelyn, the difference may not be so fundamental. More importantly, what seems crucial is the assessment of no less favourable treatment. See Pauwelyn, above n 22.

140 Art. XVII:3 GATS reads as follows: "Formally identical or formally different treatment shall be considered to be less favourable if it modifies the conditions of competition in favour of services or service suppliers of the Member compared to like services or service suppliers of any other Member.".

Finally, it is important to observe that the potential (in-)compatibilities with GATS provisions are primarily to be assessed in relation to the already existing SRR regime. It is the Regulation that provides that EU ships should be dismantled at ship-recycling facilities included in the European List. The proposed financial instrument is to be understood only as measure designed to make the SRR more effective.

General exceptions under Article XIV GATS

Even if the above challenges to a proposed financial instrument under the SRR regime were to materialize, the EU regime can nevertheless be justified under Article XIV GATS[141], the counterpart of Article XX GATT 1994. In its interpretation of Article XIV GATS, the WTO Appellate Body has considered relevant the jurisprudence on Article XX GATT 1994 and has accordingly followed the two-tiered analysis, already discussed above.[142] Accordingly most of the analysis already conducted in Section XX above, is equally relevant in this context, and will not be reiterated.

An important difference is that Article XIV equivalent to Article XX (g) GATT, but only has the equivalent provision to Article XX (a) and (b) GATT. Some scholars argue that this omission should lead the WTO Courts to a broader interpretation of Article XIV (b) GATS. In support of this position, these scholars refer, *inter alia* to a Report of the Committee on Trade and Environment, where it is recalled that at the end of the negotiations there was "a broad agreement among participants that measures necessary to protect human, animal and plant life or health were understood to include measures necessary to protect *the environment* […]."[143]

Given that so far, no case has raised this issue, the following considerations remain somewhat speculative. The main obstacle in applying letter (b) pertains to the extra-territorial nature of the measure. However, it could be argued that given the intentions of the negotiators to include the protection of the environment in this provision, the assessment of the measure under Article XIV (b) GATS, should be done resting on the jurisprudence of Article XX (b) and (g) GATT. This may reduce the legal risk generated by the extra-territorial effects of the measure.

In summary, even if the proposed financial instrument is covered by GATS, and even if some or all of its essential aspects are found to violate substantive commitments under GATS, it may still be possible to justify the measure under Article XIV (b) GATS, provided that no reasonably available alternative measure exists, that meets the EU's objectives in a less trade restrictive manner.

Concluding remarks

The above analysis shows that the proposed financial instrument is vulnerable to challenges under GATT and GATS. The success of such a challenge will depend on the strength of the facts, including evidence of the aggregate effects of the measures on traffic in transit and on environmental services affected, which may indicate (indirect) discrimination between WTO Members, such as between the EU Member States and less developed countries. Also, it was shown that the measure can be defended on a

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141 Article XIV GATS reads as follows: "Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where like conditions prevail, or a disguised restriction on trade in services, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any Member of measures: (…) necessary to protect human, animal or plant life or health (…)."

142 See for instance Appellate Body Report, United States – Measures Affecting the Cross-Border Supply of Gambling and Betting Services, WT/DS285/AB/R, adopted 20 April 2005, DSR 2005:XII, 5663 (Corr.1, DSR 2006:XII, 5475).

143 Committee on Trade and Environment, Environment and Services, WT/CTE/W/9, 8 June 1995, para 8 (emphasis added), as quoted in Thomas Cottier, Panagiotis Delimatsis and Nicolas Diebold, Article XIV, General Exceptions, in Max Planck Commentaries on World Trade Law, WTO – Trade in Services,RüdigerWolfrum, Peter-Tobias Stoll, Clemens Feinäugle, eds., Vol. 6, pp. 287-328, Leiden/Boston: MartinusNijhoff Publishers, 2008. p. 11.

number of grounds. In this context, it is crucial to show that alternative and less restrictive measures to achieve the policy objectives are not available at present.

Even if it is not possible to draw clear-cut conclusions, some suggestions can be offered on how to reduce the legal risk of WTO-incompatibility. In designing the financial instrument, the following aspects should be taken into account:

- In order to ensure that the financial instrument complies with Article V:3 GATT 1994, it is crucial that it is not construed in such a way that the contributions to a capital amount are seen as a charge. The possibility that the accrued rights are forfeited remains a problematic feature of the financial instrument, vis-à-vis Article V:3 GATT. (N.B. In case of violation the measure can still be defended on the basis of Article XX GATT 1994);
- Ensure that the measure is sufficiently flexible. Among the various forms for a financial instrument, the combination option appears to offer more flexibility and in that sense deserves to be privileged. It may be helpful to add in a dossier accompanying the proposed measure, a section that sheds light on this aspect;
- Show that the particular circumstances of different WTO Members affected by the measure are considered. It may be helpful to add in a dossier accompanying the proposed measure, a section that sheds light on this aspect;
- If considered in isolation, the WTO-legality of the proposed financial instrument would be strengthened, if the EU engages in multilateral negotiations to try to achieve international consensus about a mutually acceptable form for the financial instrument. It may be helpful to add in a dossier accompanying the proposed measure, a section that sheds light on this aspect;
- Ensure that the measure is sufficiently transparent;
- Ensure that legal remedies are or are made available to the parties affected by the proposed financial instrument. If it is deemed that under EU law these remedies are already available, it is advisable that future documents accompanying the proposed financial instrument explain the existence and nature of such remedies.

ANNEX C: EXTRATERRITORIALITY AND THE SRL

Introduction

This annex discusses the legality under public international law of the European Union (EU) giving extra-territorial effect to a possible financial instrument to facilitate safe and sound ship recycling pursuant to Regulation (EU) No. 1257/2013 (SRR). More specifically, it focuses on Port-State Jurisdiction as a legal basis and justification under the international law of the sea for the EU and its member states for imposing regulatory requirements (in particular a possible Ship Recycling Licence (SRL)) upon all ships calling at EU ports, including ships flying the flag of non-EU member states (non-EU flagged ships).

"Port State Jurisdiction" relates to jurisdiction that a state may exercise over ships visiting its ports. It is a concept used in the international law of the sea to distinguish from "Coastal State Jurisdiction" or the state's more general jurisdiction over its maritime zones, and "Flag State Jurisdiction" or the jurisdiction exercised by the state where the ship is registered and under whose flag it operates.[144] In the context of public international law, the notion of "jurisdiction"[145] is part of the sovereign powers of a state and involves the power to affect the legal position of persons, whether by legislation, by the exercise of executive powers or by decisions of the courts. Here, it relates in particular to the attribution and demarcation of the sovereign powers of a state in relation to other states and not to the internal division of powers within the state. Further this jurisdiction relates to the power both to make rules (legislative jurisdiction) and to enforce these rules (enforcement jurisdiction).

With 162 contracting states, the United Nations Convention on the Law Of the Sea (Unclos) 1982 has achieved almost universal acceptance worldwide. The EU is a party to Unclos[146] and even non-parties, such as the United States, accept the majority of its provisions as binding under customary international law. Unclos therefore provides a natural starting point and conceptual framework for a discussion of Port State Jurisdiction as a legal basis and justification for regulatory requirements of Port states with extraterritorial effects. However, since Unclos does not codify all aspects of the law of the sea[147] and in particular does not deal comprehensively with the nature or the extent of the port state's powers over foreign ships calling at its ports, other treaties and principles of customary international law need to be taken into consideration as well.

Territorial Jurisdiction

Territorial jurisdiction is the most important basis for Port state Jurisdiction. It is accepted generally, that a state has the sovereign power to exercise its legislative and enforcement jurisdiction within the boundaries of its territory. This implies that a state can pass legislation and implement policies as it sees fit, and that all persons, nationals and foreigners alike, present within its jurisdiction are subject to its laws. Therefore, by entering the territorial waters of a state in order to call at a local port, a foreign ship is deemed to submit to the territorial jurisdiction of the Port State.

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144 B. Marten, Port state Jurisdiction and the Regulation of International merchant Shipping, diss. Hamburg, Springer, 2013, p. 1.

145 Seealso: Haijiang Yang, Jurisdiction of the Coastal State over Foreign Merchant Ships in Internal waters and the Territorial Sea, diss. Hamburg, Springer, 2006, p. 30 ff.

146 Uncloswasapproved by the EuropeanCommunity by decision98/392/EC of the Council of 23 march 1998, OJ L 179, p. 1. Seealso: ECJ 3 June 2008, (C-308/06) Intertanko.

147 See the preamble of Unclos, whichaffirmsthat "matters not regulated by this Convention continue to begoverned by the rules and principles of general international law".

The territorial jurisdiction of a state to legislate over foreigners including ships under a foreign flag is not unlimited. Such restrictions may follow from the port state's domestic law and from its obligations under international law. The latter relate to the general principles of "Non-discrimination", "Good Faith and Abuse of Rights" and "Proportionality", which are recognized under Unclos and expressed in it.[148]

Non-Discrimination

The principle of non-discrimination is expressed at numerous places[149] within Unclos and GATT.[150] It prevents states from passing legislation directed at ships of a particular flag, but does not seem to pose an obstacle to legislation that applies to all ships calling at EU ports such as the proposed financial instrument of a ship recycling licence.

Good Faith and Abuse of Rights

Under Unclos, "states parties shall fulfil in good faith the obligations assumed under (Unclos) and shall exercise the rights, jurisdiction and freedoms recognized in … (Unclos) in a manner which would not constitute an abuse of rights".[151] The good faith principle in international law signals the obligation of states to fulfil their obligations under international law and not to use narrow or literal interpretations to defeat the clear intentions of the drafters of a legal instrument. However, in the absence of a concrete obligation on the part of the state, this restrictive principle is not easy to apply. Therefore, unless the proposed financial instrument conflicts with a clearly discernable obligation of EU member states as port states, the good faith principle will not provide an obstacle.

It has been suggested[152] that abuse of rights as a restrictive principle in the context of port state jurisdiction may be relevant where a port state: 1) exercises a right in an arbitrary or unreasonable manner, and 2) this causes injury to another state or its nationals, and finally 3) that this action is not justified by the legitimate interests of the port state.

Although with regard to the proposed financial instrument (the ship recycling licence) arguably the second requirement may be met since it may be construed as a detriment (and hence possibly an "injury") to the financial interests of a ship owner of a non-EU-flagged vessel, clearly the first and third of the cumulative requirements are not fulfilled. Since the ship recycling licence applies basically to all ships calling at EU ports, EU-flagged and non-EU flagged, the measure is not arbitrary. Nor is it unreasonable, since this measure is designed as a financial incentive that must induce a change in behaviour on the part of presently often non-compliant ship owners towards safe and sound ship recycling. Finally, the measure can be justified as necessary to achieve the public policy objectives pursued by the EU and its member states through the Ship Recycling Regulation, which can be seen as "more stringent measures consistent with international law, with respect to the safe and environmentally sound recycling of ships, in order to prevent, reduce and minimise any adverse effects on human health and the environment"[153] as expressly permitted by the Hong Kong Convention.[154]

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148 See: Marten, Port state Jurisdiction and the Regulation of International merchant Shipping, 2013, p. 11 ff.
149 See Articles 24(1)(b), 25(3), 26(2), 42(2), 52(2), 119(3), 227 and 234 Unclos.
150 See Articles I and V General Agreement on Tariffs and Trade.
151 Article 300 Unclos.
152 See: H. Ringbom, The EU Maritime Safety Policy and International law, 2008, p. 225 ff. Seealso: Marten, Port state Jurisdiction and the Regulation of International merchant Shipping, 2013, p. 12.
153 Recital 6 of the Preamble of the ShipRecyclingRegulation.
154 See Article 1 (2) Hong Kong Convention.

Proportionality

Although not expressly mentioned as a restrictive principle under Unclos, proportionality is a general principle of both domestic and international law. Its precise meaning and application in the present case is not clear, however, it is not easy to maintain that the proposed financial instrument of a ship recycling licence is a disproportional measure of a port state under international law. In fact many of its design elements are aimed at ensuring that the ship recycling licence has a proportional effect.

First, the measure of compulsion imposed upon the ship owner by the requirement of a ship recycling licence is only limited. He is merely compelled to set aside certain financial amounts which will be returned to the ultimate ship owner in due course if the ship is recycled in a safe and sound manner and which is forfeited if the ship is recycled in a non-compliant manner. Second, the practical and financial impact of the ship recycling licence increases as a ship calls more often at EU ports. Third, the contributions charged from ships calling at EU ships are relative to the capital amount to be accumulated for the ship in question, which in turn is related to the size and the type of the ship. Fourth, the ship licence requirement allows both ships that call frequently at EU ports and ships that do so infrequently to opt for a duration of the licence that best suits their interests.

UNCLOS and Jurisdiction over Ships

For the jurisdiction of states over ships, Unclos distinguishes between the concepts of flag state, coastal state and port state jurisdiction. It is important to observe that these concepts operate side by side and do overlap where a ship flying a certain flag enters maritime zones controlled by a foreign coastal state or calls at a foreign port.

Flag state jurisdiction

Unclos expressly provides that – whilst on the high seas – ships are subject to the exclusive jurisdiction of their flag states.[155] The flag state is further obliged to "effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag".[156] This implies that it is primarily the flag state which must take measures to ensure safety at sea by regulating the ship, by setting the standards it must meet and by monitoring and enforcing compliance.157Unclos however, does not confer upon the flag state exclusive jurisdiction over the ship, when it enters maritime zones controlled by the coastal state or the port state.

Coastal state jurisdiction

Unclos distinguishes between various maritime zones over which a coastal state may exercise its authority to a greater or lesser extent. Below the four main maritime zones are briefly described.[158] The first and second of these zones concern: (1) the internal waters[159] and (2) the territorial sea[160] of a state, both of which fall within the coastal state's territorial jurisdiction. Next comes: (3) the contiguous zone[161] in which a coastal state may exercise the control necessary to prevent (future) "infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or

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155 Article 92 (1) Unclos. Seealso: OyaÖzçayir, Port State Control, 2nd edition, 2004, No. 1.31 ff.
156 Article 94 (1) Unclos.
157 See Article 94 (3) and (4) Unclos.
158 Other maritime zonessubject to aspecialregimeconcern: Archipelagic Waters (Article 52 Unclos) and International Straits (Article 37 Unclos).
159 Article 8 Unclos.
160 Article 3 Unclosauthorizes states to establish a territorial sea of twelvenautical miles from the baseline as defined in Article 5 Unclos.
161 Article 33 (2) Unclosprovidesthat the contiguous zone may not extendbeyondtwenty-four nautical miles from the baseline.

territorial sea" or punish (past) infringement of these laws committed within its territory or territorial sea.[162] (4) The exclusive economic zone[163] finally, is a part of the high seas[164] over which coastal states may exert sovereign rights to explore, exploit, conserve and manage natural resources under and above the sea bed[165]. Further it is a zone over which coastal states may exercise (limited) jurisdiction such as to establish artificial islands and to protect and preserve the marine environment[166], always in compliance with the provisions of Unclos and with due regard to the rights and duties of other states.

Of the powers that a coastal state may exercise in the various maritime zones, its territorial jurisdiction over foreign ships navigating its internal waters is the most extensive and unlimited.[167] Although the coastal state also exerts territorial jurisdiction over its territorial sea, here its jurisdiction over foreign ships is restricted by the protection given in Unclos to the ship's right of innocent passage through the territorial sea.[168] This protection expressly precludes a coastal state from imposing requirements upon foreign ships which have the practical effect of denying or impairing the right of innocent passage or which discriminate against ships or cargoes of any state.[169] It precludes also charges from being levied from foreign ships "by reason only of their passage through the territorial sea"[170] and permits charges to levied only from foreign ships as payment for specific services to the ship and without discrimination.[171]

Port State Jurisdiction

The prevailing view in legal doctrine is that the drafters of Unclos deliberately chose not to deal comprehensively with port state jurisdiction in order not to interfere with the freedom of states to deal with their internal waters.[172] This makes it necessary to take other sources of international law than Unclos into consideration to determine the extent of port state jurisdiction.

The starting point under the customary international law of the sea is that visiting foreign ships are subject to the port state's laws and to enforcement by officials of the port state.[173] Upon this rule, only a few (minor) limitations are made in international conventions[174], none of which is relevant for the proposed ship recycling licence. In addition, customary international law recognizes limits to port state jurisdiction in case of (foreign) government vessels under the concept of sovereign immunity[175] and (arguably) also to vessels in distress. A further limitation upon port state jurisdiction may follow – depending upon the jurisdiction – from a (disputed) customary rule of

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162 See Article 33 (1) Unclos.
163 Article 57 Unclosprovidesthat the EEZ shall not extendbeyond 200 hundrednautical miles from the baselines of the territorial sea.
164 See Article 86 ff. Unclos.
165 See Article 56(1) (a) Unclos.
166 Article 56 (1) (b) Unclos.
167 See: Özçayir, Port State Control, 2nd edition, 2004, No.3.13, Haijiang Yang, Jurisdiction of the Coastal State over Foreign Merchant Ships in Internal waters and the Territorial Sea, 2006, p. 45 ff
168 Article 24 Unclos. See more extensively: Haijiang Yang, Jurisdiction of the Coastal State over Foreign Merchant Ships in Internal waters and the Territorial Sea, 2006, p. 115 ff
169 See Article 24 (1) (a) and (b) Unclos.
170 See Article 26 (1) Unclos.
171 See Article 26 (2) Unclos.
172 SeeMarten, Port state Jurisdiction and the Regulation of International merchant Shipping, 2013, p. 2 and p. 25 ff. withfurtherreferences.
173 SeeMarten 2013, p. 25 ff.
174 See Article 211 (3) Unclos in relation to a duty to give due publicity to pre-entry requirements of an environmental nature, Article 223 ff. Unclosconcerning (mostlyprocedural) safeguards in case of enforcementproceedings in case of environmental pollution. Article 15 (1) Annex VI Marpolwhichlimits port state jurisdiction in relation to certain emissionsfrom a tanker in favour of the Marpolregime.
175 Compare also the Immunity of warships and othergovernmentshipsoperated for non-commercial purposes (Article 32 Unclos), whichincidentallyislimited to the territorial sea and the high sea, see Articles 95 and 96 Unclos.

international law, respectively from a domestic law rule of the port state in relation to certain events on board the ship or the "internal affairs" of the ship.[176]

More relevant to the proposed ship recycling licence is whether ships have a customary right of access to ports under international law.[177] Such a customary right of access was recognized in the Aramco arbitration[178] of 1958. However, in the absence of sufficient evidence for the existence of such a rule of customary international law, in the following decades the opposite view prevailed among legal scholars in international legal literature. This opposite rule provides that the port state may refuse access to vessels of a particular type and may open or close its ports to international traffic as it sees fit.

In the absence of a recognized customary right of access for ships, an extensive web of bilateral treaties between states has developed internationally, pursuant to which mutual rights of port access to their respective ships are exchanged.[179] The right of access of foreign vessels under bilateral treaties or otherwise is by no means an absolute freedom.[180] States may determine which of its ports are open to international traffic and which are not. Also states may prescribe conditions for access to their ports.[181]

The exercise of Port State Jurisdiction

The "growth" in recent decades of port state jurisdiction as a tool for states to regulate both domestic and foreign ships is quite remarkable. First, there are the various regional efforts to co-ordinate and organize port state control under Memoranda of Understanding (MoU's)[182] based upon the model of the Paris MoU of 1982 and later amendments.[183] The aim of these efforts is to harmonize between sovereign states in the various regions, the enforcement of internationally accepted shipping standards upon all visiting ships[184] irrespective of flag. The EU has underlined the importance of Port State Control by adopting Directive 2009/16/EC of 23 April 2009 on Port State Control (recast) which provides both a legal basis and an obligation for the EU member states to participate in the co-ordination and harmonization of port state control on the basis of the Paris MoU.

Second, there is a long standing practice for port states to secure their vital interests with regard to public health, immigration, customs and security through border patrol legislation that applies also to foreign ships visiting their ports. Third, there are situations where port states may wish to go further than the standards agreed in international conventions under the auspices of the International Maritime Organization (IMO) or the International Labour Organization (ILO). Reasons for this approach might be the absence of standards in a particular area, or the perception that the existing international standards are only a watered down compromise or that these contains flaws or weaknesses that undermine their efficacy and that need to be remedied.

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176 SeeMarten, 2013, p. 28 ff.
177 Seeextensively: Haijiang Yang, Jurisdiction of the Coastal State over Foreign Merchant Ships in Internal waters and the Territorial Sea, 2006, p. 48 ff
178 SaudiArabia v. Arabian American OilCompany (Aramco) (1958) 27 International Law Review (ILR) 117.
179 SeeMarten, 2013, p. 33.
180 Cf. Özçayir, Port State Control, 2nded., 2004, No. 3.14. Seealso: Haijiang Yang, 2006, p. 42 ff
181 Cf. Özçayir, Port State Control, 2nedition, 2004, No. 3.14. Seealso the overview of conditions for access in Germany, the United States and China, in: Haijiang Yang, 2006, p. 61 ff
182 These are: – the Vina del Mar MoU of 1992 in relation to Latin America; – the Tokyo MoU of 1993 for the Asia-Pacific region; – the Caribbean MoU of 1996; – the MediterraneanMoU of 1997; – the West and Central AfricaMoU of 1998; – the IndianOceanMoU of 1999; – the Black SeaMoU of 2000; – the Gulf regionMoU of 2004. Finally, the U.S. CoastGuardenforces port state control over United States waters.
183 See: Marten, 2013, p. 46 ff, Haijiang Yang, 2006, p. 99 ff
184 This followsfrom the "no more favourabletreatment" rule in e.g. Article 2.4 Paris MoU 2014 version.

Multiple examples of such unilateral action by port states can be given. The United States has adopted the Oil Pollution Act 1990,which requires oil tankers to have a double hull and the United States' Cruise Vessel Security and Safety Act 2010. Australia has given extraterritorial effect to its National Employment Standards under the Fair Work Act 2009 and the supplementary Fair Work Regulation 2009 in relation to foreign-flagged ships that are 1) substantially connected with Australia (e.g. through ownership by an Australian company) or 2) engage in Australia's cabotage trade.[185]

The European Union has been particularly active in this regard[186], often in the wake of maritime casualties. Examples include: – the tragedy with the ro-ro vessel "Estonia" in 1994, which resulted in Stockholm Agreement of 1996[187] imposing more stringent stability requirements than included in SOLAS; – the disasters with the oil tankers "Erika" in 1999 and "Prestige" in 2002 which resulted in EU's phasing out of single hull tankers[188] – the EU Sulpher Directives[189]; and the EU's Directive on compulsory insurance for ship owners. [190]

Obviously, the above trend of increasing port state jurisdiction over foreign flagged ships has the simultaneous effect of eroding flag state jurisdiction over these ships.[191] One might therefore have expected protests or even judicial challenges by affected flag states against (allegedly excessive) efforts of port states in extending their jurisdiction over visiting foreign flagged vessels. However, such protests and judicial challenges have not occurred so far, the flag states have remained silent, resulting in a remarkable vacuum of international case law in this area.[192]

Conclusions

As follows from the above, port state jurisdiction can serve as a sufficient legal basis under international law for giving extraterritorial effect to the proposed financial instrument of a ship recycling licence. By seeking access to an EU port, a non-EU flagged ship submits voluntarily to the jurisdiction of the port state, which extends also to prescribing regulatory rules with financial consequences to all ships calling at EU ports.

Failing a comprehensive and exhaustive regulation of the jurisdiction of the port state over foreign flagged ships in Unclos or under customary international law and in the absence of judicial challenges by flag states of extensions of port state jurisdiction, it remains unclear where ultimately the limits of port state jurisdiction lie. Nevertheless, it seems safe to conclude that Unclos and the customary international law of the sea in general and the concept of flag state jurisdiction in particular do not constitute an unsurmountable obstacle to the EU – based upon the port state jurisdiction of the EU member states – giving extraterritorial effect to the proposed financial instrument of a ship recycling licence by making this requirement applicable to all ships calling at EU ports, hence also to non-EU flagged ships.

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185 Marten, 2013, p. 161 ff., p. 173.
186 See more extensively, H.Ringbom, The EU Maritime Safety Policy and International law, 2008.
187 Agreement concerningSpecificStabilityRequirements for Ro-RoPassengerShipsUndertaking Regular Scheduled International Voyages Between or To or FromDesignated Ports in North West Europe and the Balticsea, 28 February 1996. Seealso:Directive 2003/25/ECof 14 April 2003 on stabilityrequirements for ro-ropassengerships.
188 Regulation (EU) No 1726/2003 of 22 July 2003 amendingRegulation (EC) No. 417/2002 on the acceleratedphasing-in of double hull or equivalent design requirements for single hulloil tankers.
189 Directive 2005/33/EC of 6 July 2005 amending Directive 1999/32/EC as regards the sulpher content of marine fuels.
190 Directive 2009/20/EC of 23 April 2009 on the insurance of shipowners for maritime claims and the ShipRecyclingRegulation 1257/2013
191 Cf. Henrik Ringbom, 'The changingrole of Flag, Port, and Coastal States under International Law', in: Johan Schelin (ed.), General Trends in Maritime and Transport Law 1929-2009, Jura Stockholm, 2009, p. 104 ff.
192 Cf. Marten, 2013, p.228.

ANNEX D: WHERE TO FIND WHAT

As per section 3.5 of the Terms of Reference, an overview of the steps and achievements made towards meeting the contractual arrangements is presented here.

Research measures

To fulfil the requirements laid down in the Terms of Reference several research methods have been used. These research methods are applied to fulfil both the core tasks and the additional research questions. No specific research methods are used to address specific topics, therefore the methods used are presented below and are not distinguished between the tasks. The following methods have been adopted:

- Literature review;
- Legal analysis;
- Data(base) analysis;
- Model building;
- Interviews;
- Internal brainstorm sessions;
- Stakeholder workshops.

Core tasks

As indicated in the ToR, the study will assess the feasibility of five identified options. In addition the study needs to provide recommendations (point VI.). The table below indicates where information on the different options and recommendations can be found in the report.

Task	Where included in the final report
Description of the different options (I – V)	
I. Non-financial incentive mechanisms for compliance	Chapter, 2, subparagraph 2.5.2
II. Ship recycling fund' fed via a levy on ships calling at EU ports	Chapter, 2, subparagraph 2.5.6
III. Ship life insurance without/with transitional fund	Chapter, 2, subparagraph 2.5.5
IV. Ship recycling account and transitional fund	Chapter, 2, subparagraph 2.5.4
V. Ship recycling guarantee for old ships to prevent circumvention through reflagging	Chapter, 2, subparagraph 2.5.3
Description of specific aspect of the topics (I – V)	
Identify possible non-financial mechanisms (Ia)	Chapter, 2, subparagraph 2.5.2
Identify economic, social and environmental impacts (Ib)	Chapter, 2, subparagraph 2.5.2

Task	Where included in the final report
Identifying pros and cons (point c for all options)	Chapter 2, paragraph 2.3
Provide an update quantitative estimate (IIa)	Chapter 4, paragraph 4.1
Examine different alternatives for collection, management and disbursement of Fund monies (IIb, IIIa, Iva, Va)	Chapter 2, paragraphs 2.3 and 2.6 Chapter 4, paragraph 4.1
Examine potential ways of minimizing market distortions (IIe)	Chapter 4, paragraph 4.2
Examine legal implications (IIf, IIId, IVd, Vd)	Chapter 2, paragraph 2.3 and 2.4 + 2nd interim report Annex B.
VI. Recommendations to establish the incentive mechanism	
Policy and legislative actions needed	Chapter 5
Economic assessment of the option	Chapter 4, sub paragraph 4.2.1
Social assessment of the option	Chapter 4, sub paragraph 4.2.2
Environmental assessment of the option	Chapter 4, sub paragraph 4.2.3
Compliance with polluter-pays principle	Chapter 4, paragraph 4.1
Entailed administrative and burdens	Chapter 4, sub paragraph 4.2.1
Competition distortion	Chapter 4, sub paragraph 4.2.1
Legal challenges posed by the options	Chapter 5
Incentive specifications regarding volatility of ship recycling market	Chapter 4, sub paragraph 4.2.1
Implementation guideline for introduction of proposed option	Chapter 5

Additional research questions

Besides the core tasks the ToR identifies six additional research questions. The table below indicates where the answers to the additional research options can be found in the report.

Research questions	Where to find the answer
1) How to ensure transparency in the management of the monies and avoid that monies are used to other ends than recycling?	Chapter 2, paragraph 2.3
2) Which specifications would best allow for potential coverage of ships outside the scope of the EU SRR (especially small ships)?	Chapter 2, paragraph 2.4
3) Which existing and/or planned financial mechanism(s) in/outside the shipping sector provide(s) useful examples of specifications relevant for the design of a ship recycling financial incentive?	Several examples have been analysed, but they proved to be insufficient to reach the goals set by the SRR. Summary of the analysis can be found in the 2nd interim report Annex A.
4) Could a voluntary guarantee scheme with an option for non-EU ship owners to join be a suitable alternative to a mandatory scheme?	Chapter, 2, subparagraph 2.5.2

Research questions	Where to find the answer
5) Which specifications would best allow for potential coverage of ships flying the flag of third countries and how could the recommended financial incentive eventually be extended into an international instrument (e.g. under the auspices of the IMO)?	Chapter 2, paragraph 2.4
6) How could the new Chinese ship recycling financial incentive provide inspiration for a European system?	Chapter 2, subparagraph 2.5.2

Deliverables and meetings

According to paragraph 3.5 of the Terms of Reference the Contractor has to provide the Commission with four reports; i.e. the inception report, two interim reports and the final report. The Contractor will attend to four project meetings with the European Commission; i.e. one kick-off meeting and three interim meetings. In addition the Contractor has to organise two 1-day seminars. The table below indicates when the deliverables have bene submitted and when meeting have taken place.

	Date (submitted or meeting held)
Deliverables	
Inception report	6 February 2015
1st interim report	28 April 2015
2nd interim report	30 September 2015
Final report and executive summary	20 January 2016
Project meetings	
Kick-off meeting (to discuss inception report)	21 January 2015
1st interim meeting (to discuss 1st interim report)	19 May 2015
2nd interim meeting (to discuss 2nd interim report)	9 October 2015
3rd interim meeting (to discuss final report)	T.b.d.
Stakeholder consultation	
1st stakeholder workshop	5 March 2015
2nd stakeholder workshop	12 November 2015

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