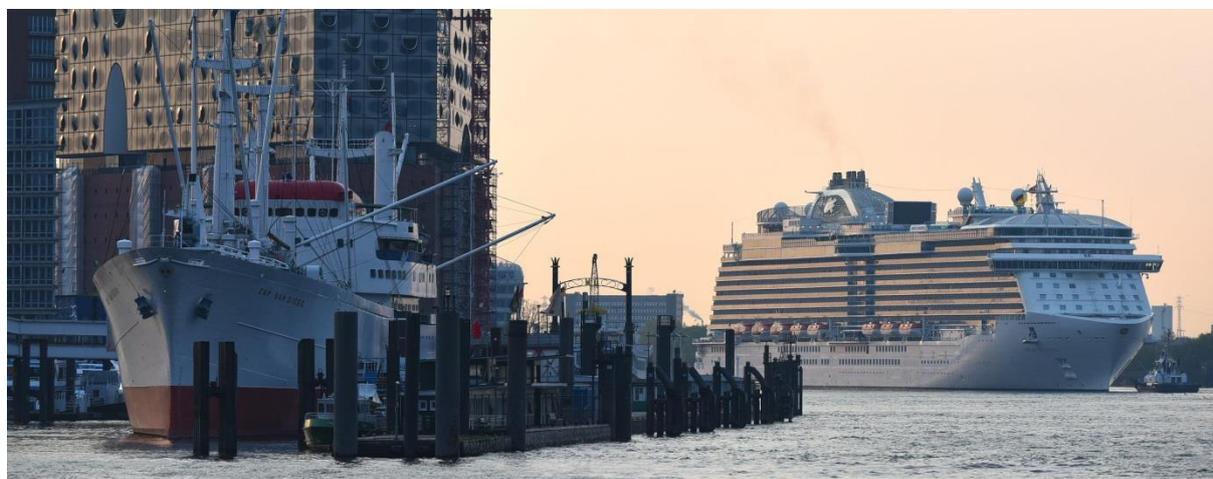


Port dues strategies and incentives for cruise line companies for using green port feature

Green Cruise Port project, Activity 4.1.2 (b)

Concept Study conducted by Maritime Institute in Gdansk.

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List of abbreviations

BA	Blue Angel
CO2	Carbon Dioxide
CSI	Clean Shipping Index
DWT	DeadWeight Tonnage
EC	European Commission
ECA	Emission Control Area
ECSA	The European Community Shipowners' Associations
EEA	European Environment Agency
EEDI	Energy Efficiency Design Index
EMEC	European Marine Energy Centre
EMS	Environmental Management System
EPI	Environmental Port Index
ESI	Environmental Ship Index
ESPO	European Sea Ports Organisation
EU	European Union
GA	Green Award
GCP	Green Cruise Port project
GHG	GreenHouse Gas
GT	Gross Tonnage
HFO	Heavy Fuel Oil
IAPH	International Association of Ports and Harbours
IMO	International Maritime Organisation
LNG	Liquified National Gas

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MDO Marine Diesel Oil

MEPC Marine Environment Protection Committee

NECA Nitrogen Emission Control Areas

SECA Sulphur Emission Control Area

SOx Sulphur Oxides

UNCTAD United Nations Conference on Trade and Development

VSR Vessel Speed Reduction

WPCI World Ports Climate Initiative

Introduction

“Port dues strategies and incentives for cruise line companies for using green port features” Concept Study has been conducted by Maritime Institute in Gdańsk as part of research within BSR Programme 2014-2020 Green Cruise Port project, Activity 4.1.2 (b). The Study is focused on the economic and environmental importance of port dues and incentives currently used in the Baltic Sea Region with recommendations for the future, presentation of the most crucial and innovative green solutions and providing best practices from the other areas. Due to its nature, cruise industry requires more customised solutions in terms of environmentally-based port dues and incentives. Cruise industry needs to develop more wider-scale incentives to meet shipping emissions standards and attract cruise operators. Those solutions should be popularized within all parties, with larger financial benefits and more harmonised discounts and rebates systems to stimulate both technological innovation and reduce ship emissions.

Maritime transport serves ca. 80 % of the global world trade volume, however it also significantly impacts the shape of environment, climate and human well-being. Greenhouse gas emissions from shipping bring ca. 2.6% of total global emissions, but this number might be tripled until 2050. European Commission (EC) stated that the main external costs of transport are linked to greenhouse gas emissions, pollution, congestion, capacity bottlenecks, accidents, spills and noise. It has been also noted that maritime transport should benefit from proper environmental fees and taxation.¹ Ports should play a crucial role in facilitating the reduction of shipping emissions, alongside the cruise operators themselves. The environmental performance of shipping can be stimulated by system of incentives and closer collaboration of port authorities with bottom up organizations e.g. the Environmental Ship Index, Clean Baltic Sea Shipping, Environmental Port Index, or Blue Angel among others.

Until recently, there was quite limited information available on the impact of port-based incentives and effectiveness of those initiatives has been considered to be rather marginal. However, recently green port dues and incentives have become subject of two in-depth analyses. In 2017, detailed COGEA's *„Study on differentiated port infrastructure charges to promote environmentally friendly maritime transport activities and sustainable transportation“* ordered by European Commission has been completed.² The Study presents such elements as qualitative and quantitative costs and benefits for reducing shipping emissions and waste, list of inventory of practices of environmental charging in EU ports and environmental and economic assessment of the implementation of

¹ International Transport Forum Discussion Paper (2015/04), EU Air Transport Liberalisation Process, Impacts and Future Considerations.

² EC *„Study on differentiated port infrastructure charges to promote environmentally friendly maritime transport activities and sustainable transportation“* by COGEA and Partners, 2017.

<https://ec.europa.eu/transport/sites/transport/files/2017-06-differentiated-port-infrastructure-charges-report.pdf>

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environmental charging schemes. Detailed port profiles, the SWOT analysis on green infrastructure charges and used environmental indexes have been also included. Despite the fact, that Study focuses more on the general green features, its Annex VI has been dedicated strictly to the environmental charging in the cruise industry with scenario of the fictional cruise calling at 5 different ports across the Mediterranean and the Atlantic Ocean.

In April 2018, The International Transport Forum at the OECD presented Case-Specific Policy Analysis „*Reducing Shipping Greenhouse Gas Emissions Lessons From Port-Based Incentives*“³. Apart of focus on the greenhouse gas emissions, the document gives list of valuable best practices and recommendations on new potential green port incentives.

This Green Cruise Port Concept Study forms a base which will serve the BSR cruise ports authorities as a transnational orientation / guideline for configuration of their port tariff systems in order to strengthening the sustainable development towards clean shipping in the BSR.

Methodology

The Concept Study collects, combines and assess most crucial information regarding successful incentives of cruise ports fostering and attracting especially port calls of “green” cruise lines.

Results of the Concept Study are based on the desk research, data collection and assessment of the most accurate information regarding successful incentives in cruise ports industry. Existing data and literature including abovementioned studies on the subject: COGEA’s „*Study on differentiated port infrastructure charges to promote environmentally friendly maritime transport activities and sustainable transportation*“ and the ITF’s „*Shipping Greenhouse Gas Emissions Lessons From Port-Based Incentives*“ have been analysed in the context of cruise shipping sector. Port dues data and pricelists have been collected and voluntary incentives systems applicable to BSR and discussed with project stakeholders are also being presented. The document has been concluded with best practices from the other regions. Following Green Cruise Project Application Form, this Concept Study also includes findings of the workshop organized by the Freeport Riga Authority and dedicated to the port dues and incentives where have been discussed.

³ ITF „*Reducing Shipping Greenhouse Gas Emissions Lessons From Port-Based Incentives*“ by Olaf Merk and co-authors, 2018. <https://www.itf-oecd.org/sites/default/files/docs/reducing-shipping-greenhouse-gas-emissions.pdf>

1 General overview of green port fees with the focus on environment and sustainability

Green port fees and incentives are a market-based tools addressing environmental impact of the shipping industry. They can be described as differentiated port fees, dues, or incentives based on ship emissions (e.g. NOX, SOX, CO₂), pollutants, waste collection, or “green” performance features of the ship calling the port, e.g. alternative fuels like LNG, or use of the OPS (onshore power supply). Other green solutions, such as incentives to reduce speed, green procurement etc. are not that common. This important policy instrument can be designed to address such negative environmental impact as air pollution, greenhouse gases, emissions to water, noise and other sustainability issues.

The main aim of environmentally differentiated port fees is to charge lower fees for less polluting ships which means that the most “green” and clean vessels get either fixed, or proportional deduction on the regular port fee. Ports apply various charging schemes of discounts and rebates according to the type, or size of the ship and its environmentally friendly technical performance. Green port fees and incentives are already implemented in several Baltic ports (starting from smaller Swedish ports since 1991 and Stockholm in 1991) aiming at reducing different types of negative environmental impacts from the shipping (Sweden was also the first EU Member State to introduce differentiated port and fairway dues). This scheme was then used in 2010s by US ports and then by ports of Rotterdam, Antwerp and Hamburg. Environmentally differentiated port fees are being applied in ca. 20% ports worldwide. According to the ITF, 28 of the world’s top 100 ports, in terms of total cargo volume handled (in tonnes) and container volumes handled (in standard containers, or TEU), apply financial incentives to decarbonise maritime transport and some of the smaller ports also deploy such instruments (see table 1).

Environmental importance of green port fees are often identified and communicated by port authorities in their port policies and mission/vision statements. The use of incentives positively contributes to sustainable port image, both from marketing and commercial points of view, it also benefits the environmentally friendly status of port city and region. Environmental charging increase awareness of port stakeholders leading to higher port competitiveness and revenue-generating potential.

Table 1. Global largest 100 ports using environmental port fees

Europe	Asia	Americas	Africa
Rotterdam (Netherlands)	Singapore	Los Angeles (US)	Durban (South Africa)
Antwerp (Belgium)	Shenzhen	Long Beach (US)	Richard's Bay
Amsterdam (Netherlands)	(China) Hong	New York/New Jersey	(South Africa)
Hamburg (Germany)	Kong (China)	(US) Vancouver	
Bremerhaven (Germany) Le	Busan (South	(Canada) Montreal	
Havre (France) Zeebrugge	Korea) Ulsan	(Canada)	
(Belgium) Sines (Portugal)	(South Korea)	Buenos Aires	
Valencia (Spain)	Tokyo (Japan)	(Argentina)	
London (UK)	Yokohama		
Bergen (Norway)	(Japan) Nagoya		
	(Japan)		
	Kitakyushu		
	(Japan) Ashdod		
	(Israel)		

Source: Own elaboration based on the ITF data

Nowadays, this solution is more common and treated as part of port's environmental policy. Port-based incentives leave possibilities to reward ship operators for their environmental features and at the end, to shape the environment. Those incentives are linked directly to green ship indexes used by ports. These voluntary ship rating systems used as basis for those discounts include Environmental Ship Index (ESI), Clean Shipping Index (CSI), Environmental Port Index (EPI), Blue Angel, Green Award and Right Ship among others.

BONUS SHEBA project survey shows that importance of green port fees introduction is relatively recognised.⁴ The environmental impact is described as limited because the rewards for green technologies are also very limited and easily compensated by savings of well-organized operations and well-managed fleets. To reach significant reductions of emissions and pollutants other policy options need to be taken on international level. Ports can facilitate this process and green port fees could play a role in a larger set of options to support different environmentally friendly practices.

⁴ SHEBA deliverable D5.3, type PU: Report on policy evaluation and tradeoffs to reduce environmental pressures of shipping in the Baltic Sea, Ecologic Institute 2018

2 Legislative framework of green port dues and incentives

Both international and EU organizations take significant efforts to reduce negative environmental impact of shipping. In 1973 the International Maritime Organisation (IMO) introduced The International Convention for the Prevention of Pollution from Ships (MARPOL) which later was amended to address not just pollution from oil, but also chemicals, waste and under an Annex VI adopted in 1997 also air pollution and ship emissions. Further developments established **Sulphur Emissions Control Areas (SECAs)** and **Nitrogen Oxide Emission Control Areas (NECAs)** in several areas of the world including the Baltic and the North Sea (SECA in 2005 and 2006, and NECA from 2021).

In October 2016, the IMO Marine Environment Protection Committee (MEPC) formally adopted a mandatory data collection system for fuel consumption of ships. In April 2018, after several years of negotiations, the IMO has reached an agreement on an "initial strategy" for the **reduction of CO2 emissions from shipping**. The MEPC announced that states have set target to cut the shipping sector's overall CO2 output by 50 percent by 2050, to begin emissions reductions as soon as possible, and to pursue efforts to phase out carbon emissions entirely. The agreement is in line with the Paris Climate Agreement's temperature goal, which seeks to limit global warming to "well below" two degrees Celsius. The 50 percent CO2 reduction goal is also in line with the proposal endorsed by the International Chamber of Shipping. In addition to the percentage target, the initial strategy also includes strengthening **The Energy Efficiency Design Index (EEDI)** efficiency requirements for new ships and reducing shipping's carbon intensity and greenhouse gases (GHG) emissions from ships.⁵ The other key IMO declaration from 2016, specifically addressing cruise shipping, states that in 2019 all new ships entering the Baltic must take their waste water away with them, or pump it on land to be treated. In 2021 this **wastewater ban** will be extended to include older ships as well. This decision was welcomed by Port of Helsinki announcing special discounts that will encourage visiting cruise ships to stop dumping at sea before the regulation enters to force. Port themselves work with growing GHG emissions. International Association of Ports and Harbours (IAPH)'s Port Environment Committee established **World Ports Climate Initiative** aiming to combat threats of the global climate change, one of the declaration points referred to the establishment and supporting of Environmental Ship Indexing. Moreover, The European Sea Ports Organisation (ESPO) and its EcoPorts network introduced the only port sector specific environmental management standard: **Port Environmental Review System (PERS)** which takes into the account both environmental management standards (e.g. ISO 14001) and specificities of ports.⁶

On the European Union level, the effective transport pricing has been included in the number of key policy documents including EC's **White Paper on Transport** and **Green Paper on Sea Ports and Maritime Infrastructure**.⁷ In 2013 Commission's communication on ports policy (COM(2013) 295)

⁵ <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/06GHGinitialstrategy.aspx>

⁶ <https://www.ecoport.com/pers>

⁷ COM(97)678 final, Green Paper on Sea Ports and Maritime Infrastructure, 10.12.1997

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stressed the need to **raise the environmental profile of European ports as a priority of the EU Transport Policy in the coming years** by *“considering whether to reward operators who anticipate or exceed the application of mandatory environmental standards and promote the use of door-to-door low carbon and energy efficient logistics chains.”*⁸

Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council establishes framework for the Community action in the field of water policy) followed by **Marine Strategy Framework Directive** (Directive 2008/56/EC of the European Parliament and of the Council establishing a framework for community action in the field of marine environmental policy) have been introduced to protect the marine environment in the most effective way, to establish good environmental status in the marine regions and subregions and combat pollution resulting from human activities, and shipping-related substances and energy. The other crucial legislations which shape the environmental protection status are **The ‘Sulphur’ Directive** and **Environmental Impact Assessment (EIA) Directive**.

The following Regulation of the European Parliament and of the Council establishing a **framework on market access to port services and financial transparency of ports** (Regulation (EU) 2017/352) has stated that *“The Commission, in cooperation with Member States, should elaborate guidance on common classification criteria for vessels for the purpose of voluntary environmental charging (...) and that “(...) port infrastructure charges may vary in accordance with the port's economic strategy and the port's spatial planning policy, related inter alia to certain categories of users, or in order to promote a more efficient use of the port infrastructure, short sea shipping or a high environmental performance, energy efficiency or carbon efficiency of transport operations (Art. 13.4).”*⁹ **The Port Reception Facilities Directive** (Directive 2000/59/EC of the European Parliament and of the Council on port reception facilities for ship-generated waste and cargo residues) aims to prevent and reduce the discharges of ship-generated waste and cargo residues into the sea. The cost recovery systems for using port reception facilities shall provide no incentive for ships to discharge their waste into the sea (Directive 2000/59/EC).

⁸ „Study on differentiated port infrastructure charges to promote environmentally friendly maritime transport activities and sustainable transportation“ by COGEA and Partners , COGEA, 2017

⁹ idem

3 Key green voluntary systems in the BSR

Most of the green port fees are based on one or more indexes expressing the environmental performance of a vessel. The scores gained within these indexes are used to justify the amount of the reduction of the regular port fees. Currently, there are few main indexes in the wide use: the **Environmental Ship Index (ESI)**, **Blue Angel (BA)**, the **Green Award (GA)** which in fact still does not correspond to cruisers, the **Clean Shipping Index (CSI)** and the greenhouse gases Emissions Rating of **RightShip**. The newest solution coming into force is a the Norwegian initiative **Environmental Port Index (EPI)** .

Table 2: Overview of most common green shipping indexes

Index	Ships covered	Number of ports using it
Environmental Ship Index (ESI)	5 500	47
Green Award	835	33
Clean Shipping Index (CSI)	2 300	5
RightShip	76 000	2

Source: the ITF

COGEA's Study identified 30 ports applying at least one environmental charging scheme in the EU with 11 of them in the Hamburg-Le Havre port range and 7 located in the Baltic Sea and one in the North Sea. In 25 cases, discounts and rebates on port dues that range from 0,5% to 20% to vessels have been certified under the Environmental Ship Index (13), Green Award (10), the Clean Shipping Index (1), and Blue Angel (1).¹⁰

¹⁰ EC „Study on differentiated port infrastructure charges to promote environmentally friendly maritime transport activities and sustainable transportation“ by COGEA and Partners , 2017. <https://ec.europa.eu/transport/sites/transport/files/2017-06-differentiated-port-infrastructure-charges-report.pdf>

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Table 3: Voluntary systems in selected Ports

Country and Port		Charge Item	Green Scheme	Incentive	Ship Rating System
LV	Free Port of Riga	Port Fee	Discount		Green Award
LT	Port of Klaipeda	Sanitary dues	Discount		Green Award
BE	Port of Antwerp	Port dues	Discount		IMO, Engine Standard
BE	Port of Zeebrugge	Tonnage dues	Discount		ESI
NL	Port of Rotterdam	Port fees	Discount		ESI, Green Award
NL	Port of Amsterdam	Port fees	Discount		ESI, Green Award
SE	Port of Gothenburg	Port dues	Discount, Additional Levy		ESI, LNG Fuel, Vessels` structure (double bottom and double sides)
SE	Port of Stockholm	Port fee	Discount, Reward		LNG-powered Vessel, Nitric Oxide Certificate issued by Swedish Maritime Administration, Shore Power connection
DE	Port of Kiel	Port charge	Discount		ESI
DE	Port of Rostock	Port dues	Discount		ESI, Marine diesel with a sulphur content of $\leq 0.1\%$ LNG or a technology leading to equivalent emission levels, Shore Power connection

Source: The ITF

Those voluntary systems have a different focus, different scoring methods and intended users (table).

Table 4: Main green ship indexes and their criteria

Index	Main criteria	Main target group	Scores determined by
Environmental Ship Index	NO _x , SO _x , CO ₂ , shore power	Ports	Self-assessment ship-owners, some audits by ports
Green Award (not for cruisers)	Safety, service quality and environmental performance	Ports, banks, maritime service providers	Audits and verification by Bureau Green Award
Clean Shipping Index	NO _x , SO _x , PM, CO ₂ , chemicals, water and waste.	Shipping companies, shippers, ports and authorities	Submission by carriers, verification by verification companies
GHG Emissions Rating	Ship energy efficiency	Charterers, shippers, banks, ports, terminals	RightShip based on variety of sources

Source: The ITF

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Environmental Ship Index (ESI) ¹¹

- a voluntary system designed to improve the environmental performance of sea going vessels, developed through World Ports Climate Initiative (WPCI) and the International Association of Ports and Harbors (IAPH)
- focused on minimizing of ship air emissions (SOx, NOx and in longer terms CO2), not relevant for wastet
- the index calculation methodology is based on MARPOL Annex VI Indicators and tools
- The ESI formula is built up of different parts for NOx, SOx and CO2; additionally a bonus is awarded for the presence of an On-shore Power Supply installation (OPS). The ESI Score ranges from 0 for a ship that meets the environmental performance regulations in force to 100 for a ship that emits no SOX and no NOX
- The minimum score to have a discount is 20 points (except 1 port that gives discount with a score of less than 20)
- 12 ports (out of 25) provide discounts from a minimum ESI score of 20 points or more 2 ports (out of 25) provide discounts from a minimum ESI score of 25 points or more
- 9 ports (out of 25) provide discounts from a minimum ESI score of 30 points or more Only 1 port provides discounts from a minimum ESI score of 50 points or more
- Average percentage discount of all ESI is 20% of the port fees
- Average percentage discount of 20 points in the ESI score is: 20 points = 10% of the port fees, 30 points = 14 %, 40-50 points = 34% of the port fees
- Participating: several cruise operators and global ports in Europe e.g. Rotterdam, Amsterdam, Hamburg, Rostock, Göteborg, Bergen, Helsinki, Oslo.

Picture 1: Environmental Shipping Index benefits



Source: ESI

¹¹ www.environmentalshipindex.org

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The Green Award (GA)¹²

The Green Award Requirements address issues related to quality, safety, environment and technical areas related to the ship and the ship manager's office. **Important remark: the index does not cover cruise industry.**

Examples of requirements related to environment:

- Exhaust emissions
- Water ballast
- Anti-fouling
- Ship breaking
- Navigation in 'sensitive areas'
- Waste management

The Clean Shipping Index (CSI)¹³

- Independent, b2b and holistic labeling system of vessels' environmental performance
- Practical, dynamic tool for differentiating port- and fairway fees or choosing more sustainable shipping alternatives.
- focused on minimizing of ship emissions (SOx, NOx, CO2), chemicals, waste & water (including discharges, sewage, ballast water), particulate matter (PM).
- each area of emission has a maximum score of 30 points each.
- Reduced port fees by: Brofjorden, PetroPort, Port of Gothenburg, Port of Vancouver, Port of Prince Rupert, Port of Gävle

Blue Angel

<https://www.blauer-engel.de/en/>¹⁴

- German eco-label system
- helps to reduce the emissions and releases of pollutants into the marine environment caused by a seagoing vessels
- tankers and product, carriers, chemical tankers, gas carriers), ships coming under the High Speed Craft Code, fishing vessels, recreational ships and navy ships are not included.
- reduced port fees by e.g. Port of Hamburg

¹² <http://www.greenaward.org/>

¹³ <http://www.cleanshippingindex.com/>

¹⁴ <https://www.blauer-engel.de/en/>

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Environmental Port Index (EPI)

A recent addition to the current collection of green ship indexes is the Environmental Port Index (EPI). EPI was initiated by Port of Bergen in 2017, and is now developed in a partnership between 11 Norwegian cruise ports and DNVGL, the international ship classification society and consultancy company. An EPI score will initially reflect aspects related to air emission (NO_x, SO_x, PM, CO₂) but the scheme can easily be adapted to include other aspects like effluents to sea, waste handling etc. EPI will initially focus on cruise ships, but the concept is general in nature and can thus serve as a tool for all ship types.

One of the prime reasons EPI was developed was to capture how ships are operated while in port. Experiences show that the energy consumption of two ships of same class and size may vary with up to 30% while at quay. EPI captures the operational gains and the deviation from a baseline regarding what performance to expect in general. The operational parameters will be reported from the individual ships upon departure from quay. A digital reporting system is under construction, allowing an automated production of the EPI score including integration towards the port administrative IT systems, for environmental reporting and invoicing.

EPI will be put to work for differentiated charging of cruise ship arriving in Port of Bergen from the 2019 season and onwards. Most of the other ports in the partnership will be starting in 2019 or 2020. Port of Bergens EPI based charging system will be linked to most of the dues and taxes managed by the port. The system aims to become a positive incentive for the green ships and to build barriers for the not so green ones. DNVGL will maintain and develop the EPI production system, making it available to the participating ports on an annual subscription basis.

Picture 2: Cruise vessels in Port of Bergen



Source: Erik Ask / Bergenships

4 Differentiated charges used in the selected ports including Green Cruise Port project area

Following terms should be taken into the account while establishing incentives systems:

- Port tariffs – standard port dues on vessels and cargo including all typical port operations (pilotage, berthing, towage, equipment hire, cargo handling, fuel etc.)
- Discount and rebates – the main element of differentiated charges/incentives with value based on the previously presented green indexing systems and certificates (ESI, CSI, Blue Angel etc.). Discount guarantees monetary deduction at once while rebate means later deduction e.g. at the end of year when number of fleet calls is valid.
- The majority of ports apply green discounts and rebates that range from 0,5% to 20% of the port fees. The maximum rebates are between range from 3% up to to 80%. Rabates are usually applied on fees proportionally to vessel's size, or in some cases are based on the type of vessel (e.g. Swedish Fairway dues). Fixed discounting system is being notably used by Port of Los Angeles.
- Differentiated charges – discounted basic harbour dues applied in case of high environmental performance of the vessels.

Table 5. Green port fees rebates in selected ports

Port	Basis for rebate	List of rebates
Antwerp (Belgium)	ESI	10%
	LNG/scrubbers	10%
Rotterdam (Netherlands)	ESI, Green Award	up to 30%
Le Havre (France)	ESI	10%
Hamburg (Germany)	ESI	up to 10%
	Green Award	up to 3%
	Blue Angel	up to 2%
	LNG	up to 15%
	Port power discount (if port power is used)	up to 80%
	Surcharges and reductions based on the IAPP level	(+15% / - 30%).
Klaipeda (Lithuania)	Green Award	20%
Oslo (Norway)	ESI	50%
Kiel (Germany)	ESI	10%
Ghent (Belgium)	ESI, Green Award	15%

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Gothenburg (Sweden)	ESI, CSI LNG	10% 20%
Riga (Latvia)	Green Award (tankers only)	10%
Long Beach (US)	IMO Tier III Engines	USD 6 000/call
New York-New Jersey (US)	ESI, VSR	USD 2 500/call
Panama	ESI, EEDI, NOx, LNG	20%
Buenos Aires (Argentina)	ESI, Green Award	10%
Busan (South Korea)	ESI	15%
Tokyo (Japan)	ESI	50%
Yokohama (Japan)	ESI, Green Award	15%
Singapore	EEDI, scrubbers	50%

Source: Own elaboration based on the ITF and port data

The **Port of Rotterdam** is the interesting case of applying differentiated port tariffs based on ship environmental performance. The port rewards vessels that have a high ESI score and those with a Green Award certificate through discounts on the port dues. Vessels that score high on the ESI (with a score of 31 or more) and perform better than the legal norm will be rewarded a 10% discount on the gross tonnage part of the port dues. Since January 2015, it is possible to double this discount based on low NOx emissions (if the ship has an individual NOx score of 31 or more). The Port selects eligible vessels every quarter and grants discounts for up to 20 individual calls per quarter. The Port offers a 6% discount on port dues already paid, for oil and oil product tankers, and for LNG tankers with a Green Award certificate provided that the vessel have a deadweight of 20 000 tonnes and more. It also offers a 15% discount for inland vessels with a Green Award Certificate score below 400 points for the main engine and a 30% discount for those with a Green Award Certificate delivered after June 17 2014 and a score of 400 and above. However, the port announced that in 2013 and 2014 ESI certified ships represented 19% and 21% of total calls, while ships that got rebates with a score equal to or higher than 31) were around 7% of total calls (COGEA Study, 2017).

Tables in the Annex I show incentives applied in the Green Cruise Port Partners and Associated Partners' Ports.¹⁵ Here we can also bring the example from **Port of Helsinki** where the environmental discount can only be applied for under one of the following categories. The discount can be up to 3% off the vessel charge and is granted based on a free-form application submitted to the Port, detailing

¹⁵ Annex I of the Study

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the discount category that the application pertains to as well as the information requested for the category in question, as detailed below:

1. Low emissions

If the vessel has a valid ESI certificate with

- an ESI score of ≥ 80 : 3% discount on the vessel charge (e.g. LNG vessels)
- an ESI score of ≥ 65 : 2% discount on the vessel charge (vessels that use onshore power while docked at the port, for example)
- ESI points granted for the installation of onshore power supply systems (10 points) are included in the calculation only if the vessel regularly uses onshore power while docked at the Port of Helsinki.

2. Output noise level

If the vessel's total noise emissions, meaning its maximum sound power level (LWA), while docked at the passenger harbour is below 105 dB, a 2% discount is granted on the vessel charge.

3. Environmental innovations/investments

A discount of 1–3% on the vessel charge may also be granted based on investments or innovations that improve a vessel's environmental or energy efficiency, reduce emissions or improve noise abatement.

Additionally: lower waste charges for international cruise ships leaving wastewater in Helsinki.¹⁶

¹⁶https://www.portofhelsinki.fi/sites/default/files/attachments/guidelines%20environmental%20discount_0.pdf

5 New green incentives including best practices from the other areas.

Green port fees based on the green ship indexes which look at energy efficient ship design are used most frequently. However, some ports and regions are implementing new environmentally friendly solutions which might become important incentives for the green cruise industry. Following available COGEA and the ITF studies and discussion with stakeholders, we could name such solutions as:

Vessel speed reduction – slower speed might lead to drop in the global GHG emissions from shipping. US ports, notably Los Angeles and Loand Beach adapted **Vessel Speed Reduction Programme** with discounted port dues given to ships which shown at least 90% compliance during one year period. Port of New York-New Jersey is treating lower vessel speed as additional ESI score element.

Carbon-pricing schemes – Shanghai acts as model solution for this possible incentive, in this case ports and domestic shipping are included in carbon-pricing system meaning that the port get assigned certain amount of GHG emission rights which could not be exceeded, unless Shanghai International Port Group buys additional rights from companies that manage to reduce their GHG emissions. Also Norwegian NO_x Fund can be treated as such incentive In this scheme, all ships operating in Norway pay a fee which goes into the NO_x Fund. Shipping companies can apply for a subsidy from the same fund to get innovative shipping projects funded that would help to reduce NO_x emissions from their ships. These experiences gave the inspiration for the proposal for a European Maritime Climate Fund which proposed by the European Parliament and further discussed between European Parliament, Council and Commission in 2017. (via ITF).

Use of alternative fuel and energy – As of 1 January 2015, sulphur content allowed in Sulphur Emission Control Areas (SECA) decreased from 0.1% m/m. Vessels sailing within SECAs are obliged to either use distillate fuel such as marine gas oil (MGO), which is poorer in sulphur content and more expensive than regular heavy fuel oil (HFO) The most environmentally-friendly alternative is here to install an **liquefied natural gas (LNG)** solution. Some ports such as Singapore, Hamburg, Antwerp, Rotterdam, Bremerhaven, Gothenburg plus the Panama Canal Authority already provide port fees rebates for LNG-powered vessels. This financial incentive supports other port efforts to stimulate development of LNG bunkering facilities.

Installation of scrubbers – scrubbers, ship exhaust gas- cleaning devices are also being considered as environmentally friendly, pro-SECA solution.

Waste – ports as Klaipeda, Tallin and Kotka already apply discounts related to waste management which is particularly important for cruise industry which generates large amounts of waste on board.

Use of on-shore power supply (OPS) facilities – such ports as Vancouver (discount on port fees) and Stockholm (subsidy form) already provide financial incentives for ships using OPS. This incentive

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could be also offered in form of discounted electricity price or via tax exemptions already used in Sweden. COGEA study includes detailed analysis of OPS icosts vs. savings calculating 30-50% rebates as investments payback. Under certain circumstances green incentives may shorten the OPS and LNG installation payback period of the investment by one or more years.

Noise – issue of noise has been raised during several discussions with project stakeholders, its minimalization should be also considered in the context of green incentives.

Green berth allocation – solution related to reduction of waiting time and turn-around time in ports which might also follow green criteria. This system is used only at the Panama Canal where **Environmental Premium Raking** has been introduced in 2017. The environmental ranking allows greener ships to gain extra points in booking system which means the priority in the slots allocation.

Green procurement –. Current green ship indexes could be however used as preconditions for bids respecting the natural environment. This solution in maritime services practically does not exist, with the exception of Spain

6 Results of the Green Cruise Port “Port dues and other incentives for greener cruise ports” workshop in Riga

In the Green Cruise Project Application Form it has been stated that this Concept Study should also take into the account findings of the workshop organized by the Freeport Riga Authority and dedicated to the port dues and incentives where *“port authorities and cruise lines of the project partnership will have to think about common acceptable solutions which cause a benefit on both stakeholder sides and beyond. Moreover, the participating BSR cruise ports have to talk about common strategic approaches in using port dues as incentives for a sustainable development of cruise port infra- and superstructure. Concerning this, cruise ports will have to bundle forces to strengthen their position. This workshop will be an important input for A. 4.1.2 (b).”* At the event which took place in April 2018, Prof. dr. Michelle Acciaro from German Kuehne Logistics University shown detailed findings of the above-mentioned EC study.¹⁷ The SWOT analysis on environmental incentives has been also discussed and selected Project Partners have presented system of port dues in their ports. Speakers agreed that it is important to know what are the costs related to operation of the port and relevant charges to the port dues, these are not the only elements to be taken into account for pricing purposes.¹⁸

During 2-day workshop in Riga speakers argue that it is important to know what are the costs related to operation of the port and relevant charges to the port dues, these are not the only elements to be taken into account for pricing purposes. Port dues have another important function- to balance the effects from cruise shipping to the surrounding environment.

The benefits from cruise terminal service users could present reasonable pricing regarding the actual maximum of real costs, use of facilities and infrastructure. Port pricing system could take into account all these factors to build up realistic and adequate pricing system focusing and looking forward for port users - ship owners and cargo owners who had identified and upgraded environment friendly systems. Port authorities and port dislocations are quite different, due to their difference their ability to detect one, absolute solution for solving environmental problems is limited from the point of view of such but not only factors like each port type and functions, development objectives, cargo types handled in the port, ships' types and age, number of calls and intensity of cruise shipping, port infrastructure, sensitivity of surrounding areas, need for investments for port development etc . Port dues pricing for Cruise shipping as any other cargo could be influenced mainly by such factors as terminal infrastructure; number of calls; cruise ship gross tonnage (GT) ;cruise ship environmental ability ; sensitivity of surrounding areas ;ports' Investment policy ; geographical

¹⁷ Presentaton available at:

http://www.greencruiseport.eu/files/public/download/events/riga/06_GCP%20WS%20Riga%20Green%20Port%20Incentives%20KLU.pdf

¹⁸ Green Cruise Workshop “Port Dues and other incentives for Greener Cruise Ports” Final Report http://www.greencruiseport.eu/files/public/download/events/riga/Workshop%20Report%20Riga_final.pdf

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location. Thus the general discussion on influence to the specific port dues pricing for cruise ships from the side of ports' authorities was discussed during the workshop. To change the existing pricing practises at the ports, ports authorities could initiated such steps : to detect the main problem connected with cruise shipping calling the port; to start monitor the data on cruise ships calling the port; analyse the data and detect weak points ; negotiate with relevant stakeholders ; to elaborate port pricing system based on sustainable principles; to verify the viability of sustainable port dues .

After the unit to be used as the basis for assessing the sustainable port dues has been established, it could be reasonable to form the common way of applying it. What seems at the first sight - that port pricing system used at certain port will help to enhance sustainable cruise shipping after looking deeper from the ships' side will give serious reflections.

Cruise ship plans its route not taking in to account ports' pricing systems, the main focus is to look for amazing destinations. Differences in port rules including port dues pricing systems do not allow use ships financial and human resources in most efficient way. So it could be reasonable to start discussion between different stakeholders on developing the common sustainable port pricing policy for certain cruise ports. To enhance the sustainable cruise shipping it should be essential to realize sustainable port duties system not only in one port. The area covered by as much ports as possible will give strong support for involved stakeholders to develop their ability to use sustainable port dues pricing system and to make environmental adjustments essentially important from the point of view of sustainability. Agreed port dues pricing system at several cruise ports will give strong basis for 'green' innovations and investments in cruise industry at the same time providing decrease of environmental impacts.

Conclusions

Information on impact of port-based incentives on the environment is still rather limited and at the moment they are often self-regulated at the level of port authorities. Green incentives can be fully effective only when they persuade shipping lines to change their behaviour and reduce ship emissions. Development of new services based on green incentives impose cruise operators and port managies bodies to be a the frontier of environmental pro-activeness;

Many of green measures do focus on ship design and operations, however port authorities should also play important role in facilitating the reduction of shipping emissions. When properly implemented, green policy can lead into economic savings. Green fees also directly benefit port authorities increasing ports' competitiveness and economical results plus improving their public image and state of human well-being in the surrounding areas (by minimizing negative impact of air emissions, waste and noise). Green fees require collaboration, global, harmonised system and thinking in long-perspective, at the same time more local initiatives are also needed. The incentive schemes are in general well established on port level, but also harmonized pan-Baltic port fee systems, or worldwide systems need to be discussed with advantages both for shipowners and ports. Fair and efficient transport pricing is already present in a number of policy documents issued by the European Commission. Environmental charging is the important direction in towards this policy. Green port fees would be also more effective when more ports and vessels are covered by those features. Effects of green incentives implementation should be constantly monitored, reported and verified taking into the account "polluters pay" rule.

When all ports in the EU apply their own environmental charging scheme, an average 30% discount on port dues for 'green ships' could result in financial incentives for the shipping sector up to 1,4 billion euro over a 5-year period (COGEA, 2017). COGEA's projections are based on the assumption that 30% of calls in EU ports are eligible for a discount. Port-based incentives should be also focused on reducing shipping's GHF emissions. A considerable share of world ports (28 out of the 100 largest global ports) apply reductions of port fees for ships with better environmental performance. The future uptake of electric ships could benefit from reductions on port fees, particularly if applied in many ports and if the reduction is substantial. Governments can also stimulate the private financial sector to provide green ship finance instruments.¹⁹ Such solutions as OPS and LNG require significant investments from both port authorities and ship owners, in this case green incentives might reduce the payback period of those investments.

General cargo shipping and cruise sector should not be equally treated – more customized solutions and special green discounts for the cruisers are needed. Cruise sector has slightly different needs from the other shipping area. It would benefit from more consistent approach to environmental

¹⁹ The ITF Study „Decarbonising Maritime Transport Pathways to zero-carbon shipping by 2035“ <https://www.itf-oecd.org/sites/default/files/docs/decarbonising-maritime-transport.pdf>

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charging to obtain reductions on port dues, or waste collection fees in all ports of call based on set of similar rules. This would allow to cumulate rebates, while at the same time reducing the administrative and technical costs of becoming compliant with the scheme. (COGEA, 2017 Annex VI Environmental charging and the cruise industry). At this moment different ports apply different discounts with using different green indexes (ESI, CSI etc.).

In case of cruise industry, green incentives also play important marketing role – cruise operators choose port destinations due to their touristic attractiveness, not just for the environmental policy.

COGEA's cruise scenario confirms that from the point of cruise lines's view, acquiring a certification from an environmental initiative would carry positive implications in terms of marketing image and could also be seen as one of the steps to reduce the overall environmental footprint of the industry; an effort which costs would be partly compensated by the incentives from reduced port dues. From the point of view of cruise port cities environmental charging would not be a determinant factor in competition between destinations, yet harbouring cleaner ships would inevitably improve air quality and contribute to better waste management at little to no cost. The more unified, consistent take on cruise ships green incentives would be perfect solution for all parties – ship operators, port authorities, passengers and port cities as they all could benefit from more green solutions resulting in cleaner air, new technologies and improved waste management.

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**Annex I:
Environmental incentives applied in the selected Green Cruise Port
Partners and Associated Partners' Ports**

Port of Amsterdam

Country	Netherlands										
Geographic location	Hamburg-Le Havre port range										
Port specialization	Liquid bulk: 25 < 50 mln tonnes/ year Dry bulk: 25 < 50 mln tonnes/ year										
Environmental charging scheme based on	Environmental Ship Index										
Scheme description	<p>A discount on port dues is applied to ships with an ESI total score of at least 20 points. An extra discount is applied to ships with a score higher than 31 points.</p> <p>The discount is not a fixed percentage and depends on the gross tonnage of the ship, as follows:</p> <p>GT Class Reward</p> <table style="margin-left: 20px;"> <tr> <td>0 – 3000</td> <td>€ 200</td> </tr> <tr> <td>3001 – 10000</td> <td>€ 500</td> </tr> <tr> <td>10001 – 30000</td> <td>€ 900</td> </tr> <tr> <td>30001 – 50001</td> <td>€ 1200</td> </tr> <tr> <td>50001 – up</td> <td>€ 1400</td> </tr> </table> <p>the calculating formula of the height of the incentive is: - ESI-score ≥ 20 points: score/100 multiplied by “GT-class reward” - ESI-score ≥ 31 points: add 1/4 of the “GT-class reward”</p>	0 – 3000	€ 200	3001 – 10000	€ 500	10001 – 30000	€ 900	30001 – 50001	€ 1200	50001 – up	€ 1400
0 – 3000	€ 200										
3001 – 10000	€ 500										
10001 – 30000	€ 900										
30001 – 50001	€ 1200										
50001 – up	€ 1400										
Environmental charging scheme based on	Green Award										
Scheme description	<p>A discount of 6% on port dues applied to Crude oil/Product Tankers that are certified with Green Award</p> <p>A discount of 5%, 10% or 15% on port dues for inland barges according to their Green Award level (Bronze, Silver, Gold)</p> <p>A discount of 10% on port dues for inland barges with certificates issued before the 17th of June 2014</p>										
Environmental charging scheme based on	Emissions report discount for cruise vessels in 2018										
Scheme description	Any cruise liner that berths in the Port of Amsterdam and reports on the emissions that occurred during the time in berth via a by the board of Port of Amsterdam approved form, will be eligible for a € 500 reduction on the sea harbour dues.										

Source: COGEA, own elaboration based on Port of Amsterdam 2018 pricelist.

Port of Bergen

Country	Norway
Geographic location	Northern Sea
Environmental charging scheme based on	Environmental Ship Index
Scheme description	<p>Vessels registered with the Environmental Ship Index (ESI), are granted a port-charge discount of 20% for an ESI score over 30 and 50% for an ESI score over 50. The discount is calculated based on charges payable after the deduction of any liner reductions. Valid ESI certificate and advance notice of the ESI registration are required for the discount to apply.</p>
Environmental charging scheme based on	International Standard IEC/PAS 80005-3 for onshore power supply (or the LNG use)
	<p>Vessels compliant with the International Standard IEC/PAS 80005-3 for onshore power supply, or are using LNG as fuel, qualify for a 20% discount on the wharfage dues. Vessels compliant with other standards for onshore power supply, will also be granted 20% discount on the wharfage dues. The discount is calculated based on charges payable after the deduction of any liner reductions. Advance notification is required in order to claim the discount. Minimum wharfage charge is NOK 300 per 24-hour period or part thereof.</p>

Source: own elaboration based on Port of Bergen 2018 pricelist.

Port of Gothenburg

Country	Sweden
Geographic location	North Sea
Ownership/governance	Municipality
Owner of the land	Municipality
Terminals operated by	Private company
Port specialization	Passenger (non cruise): 1 < 3 mln/ year Passenger (cruise): < 1 mln/ year Containers: 0,5 < 1 mln TEUs/ year Liquid bulk: 15 < 25 mln tonnes/ year RoRo: < 5 mln tonnes/ year
Environmental charging scheme based on	Environmental Ship Index
Scheme description	Vessels with a minimum ESI score of 30 points are granted a 10% discount on port dues, based on GT.
Environmental charging scheme based on	Clean Shipping Index
Scheme description	Discount of 10% on port dues applied to ships that achieve green standard (at least 4 stars) according to the CSI
Environmental charging scheme based on	LNG use
Scheme description	Vessels running on Liquefied Natural Gas (LNG) are entitled to an additional 20% discount . The LNG discount is given provided Port Control at the Port Authority is informed when the vessel makes its first call at the port.
Frequency discounts	For cruise liners belonging to the same shipping company, or to a company operating under the same brand, there is a 15 % discount off port dues from the seventh call at the Port of Gothenburg in any single season.
Authority in charge of the scheme	Local administration
Port certified with	ISO 140001 certification

Source: COGEA, own elaboration based on Port of Gothenburg 2018 and 2019 pricelists

Port of Hamburg

Country	Germany
Geographic location	Hamburg-Le Havre port range
Ownership/governance	Municipality
Owner of the land	Municipality
Terminals operated by	Private company
Port specialisation	Passenger (cruise): < 1mln/ year Container: > 5 mln TEUs / year Liquid bulk: 5 < 15 mln tonnes/ year Dry bulk: 25 < 50 mln tonnes/ year RoRo: < 5 mln tonnes/ year
Environmental charging scheme based on	Green Award
Scheme description	Discount of 3% on port dues applied to crude oil, product and chemical tanker and LNG carriers of any size that hold a valid Green Award certificate.
Environmental charging scheme based on	Environmental Ship Index
Scheme description	Environmental discount of 15% on the gross tonnage portion of port dues applied to ships that are solely powered by LNG i.e. with and ESI-SO _x score = 100). However, the discount cannot exceed EUR 2 000 and is limited in time until December 2018. Discount on the gross tonnage portion of port dues applied to ships with the following overall ESI scores: ESI score 20 up to < 25 = 0.5% discount, maximally € 250 ESI score 25 up to < 35 = 1%discount, maximally € 500 ESI score 35 up to < 50 = 5%discount, maximally € 1,000 ESI score ≥ 50 = 10% discount, maximally € 1,500
Environmental charging scheme based on	Eco-friendly port power discount on the berth operation portion.
Scheme description	Discount of 15% on the gross tonnage portion of port dues applied to ships that use shore power while berthing in the port. The overall discount cannot exceed EUR 3000 depending on ships price categories.
Environmental charging scheme based on	Port power discount
Scheme description	Port power discount (if port power is used) up to 80% Cruise ships are granted discount up to 15% (max. 2000 EUR), or 20 % (max.3000 EUR) on Port power Gross Tonnage (GT) fee, depending on ships price categories listings.
Environmental charging scheme based on	Blue Angel
Scheme description	Discount of 2% on the gross tonnage portion of port dues applied to ships that hold a valid RAL-UZ 110 (Blue Angel) certificate.

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Non-monetary incentive: berthing policy of cruisers	<p>ESI vessels with a high ESI-score can benefit from some preference in the berthing policy of cruise vessels.</p> <p>In case of multiple booking for the same date and berth in Hamburg, priority will be given according to the following criteria:</p> <ul style="list-style-type: none"> - Vessel size and maximum passenger capacity (registered lower berth capacity); - Frequency of calls of the specific vessel ; - Number of passengers in turnaround In instances where there is uncertainty due to 2 or more vessels from the same categories calling on the same day. <p>Ships with better environment-friendly settings (according to the ESI) shall encounter preferential treatment.</p>
Other discounting schemes	<p>Surcharges and reductions based on the IAPP level (+15% / - 30%).</p> <p>Frequency rebates, repairs, low season discounts.</p>
Environmental contribution	<p>Hamburg Port Authority also contributes 5% of the port dues collected to the Elbe Habitat Foundation. The foundation's aim is to improve the ecological conditions of the tidal river Elbe and to protect the biodiversity and unique habitats along the river.</p>
Authority in charge of the scheme	<p>Local administration</p>
Port certified with	<p>ISO 140001 certification</p>

Source: COGEA (2017) and own elaboration based on Hamburg Port Authority's 2018 General Terms and Conditions (Schedule of Fees and Charges Maritime Shipping – Annex)

Port of Klaipeda

Country	Lithuania
Geographic location	Baltic Sea
Ownership/governance	State
Owner of the land	State
Terminals operated by	Private Company
Port specialisation	Container: 0,25 < 0,5 mln TEUs / year Liquid bulk: 5 < 15 mln tonnes/ year Dry bulk: 15 < 25 mln tonnes/ year RoRo: < 5 mln tonnes/ year Other cargo: 5 < 15 mln tonnes/ year Passenger (non cruise): < 1 mln/ year Passenger (cruise): < 1 mln/ year
Environmental charging scheme based on	Green Award
Scheme description	Vessels, which have operational ship-generated waste processing system installed under international certificates ("Green Award"), and also apply other state-of-the-art systems for waste management whereby amount of generated waste is reduced and waste is recycled and sorted are granted 20% discount on sanitary dues.
Authority in charge of the scheme	Port authority. Approval from another level of government or an independent regulator is needed
Incentives for terminal operators or other stakeholders	The new waste management plan enforces rules regarding the procedure of waste disposal and treatment
Port certified with	ISO 140001 certification

Source: COGEA (2017) and own elaboration based on Port of Klaipeda 2018 pricelist

Port of Riga

Country	Latvia
Geographic location	Baltic Sea
Ownership/governance	The state and municipality through the Freeport of Riga Authority (separate entity - derived legal person governed by public law)
Owner of the land	The state, municipality or a private entity (legal or natural person) - based on the Law on Ports (Section 4)
Terminals operated by	Private company
Port specialisation	Passenger (non cruise): < 1 mln/ year Passenger (cruise): < 1mln/ year Container: 0,25 < 0,5 mln TEUs/ year Liquid bulk: 5 < 15 mln tonnes/ year Dry bulk: 15 < 25 mln tonnes/ year RoRo: < 5 mln tonnes/ year
Environmental charging scheme based on	Green Award
Scheme description	A 10% discount on all Port Dues and Charges shall be granted to tankers, carrying crude oil, that were awarded a Green Award Certificate
Incentives for terminal operators or other stakeholders	Carrying out constant improvements of the Port Authority service provisions technologies with lower consumption of resources and more careful attitude towards the environment; Ensuring compliance with the environment protection requirements provided for in laws and regulations and other mandatory documents in activities carried out by all structural units of the Port Authority; Facilitating introduction of environmentally friendly raw materials and technologies in the Free Port of Riga.
Port certified with	ISO 140001 certification

Source: COGEA (2017) and own elaboration based on Port of Riga 2018 pricelist

Port of Rostock

Country	Germany
Geographic setting	Seaport
Geographic location	Baltic Sea
Ownership/governance	Municipality and State
Owner of the land	Port Authority
Terminals operated by	Private port service providers / Port Authority (ferry terminal)
Port specialisation	Passenger (non cruise): 1 < 3mln/ year Passenger (cruise): < 1mln/ year Liquid bulk: < 5 mln tonnes/ year Dry bulk: 5 < 10 mln tonnes/ year RoRo: 10 < 15 mln tonnes/ year (gross weight) Other cargo: < 5 mln tonnes/ year
Environmental charging scheme based on	Environmental Ship Index
Scheme description	Discount on port dues applied to cargo and passengers ships with the following overall ESI scores: ESI score ≥ 60 = 10% discount; ESI score ≥ 50 = 7,5% discount; ESI score ≥ 40 = 5% discount.
Port certified with	ISO 140001 certification

Source: COGEA (2017) and own elaboration based on Port of Rostock 2018 pricelist

Port of Rotterdam

Country	Netherlands
Geographic location	Hamburg-Le Havre port range
Port specialisation	Containers > 5 mln TEUs/ year Liquid bulk: 50 < 100 mln tonnes/ year Dry bulk: 50 < 100 mln tonnes/ year
Environmental charging scheme based on	Green Award
Scheme description	Discount of 6% on port dues applied to Crude oil/Product Tankers and LNG carriers that hold a valid Green Award certificate. Discount of 15% on port dues applied to inland barges that hold a valid Green Award certificate.
Environmental charging scheme based on	Environmental Ship Index
Scheme description	Discount of 10% on the gross tonnage portion of port dues applied to ships which score 31 points or more on the Environmental Ship Index At the end of each quarter Port of Rotterdam Authority will determine which vessels are eligible for the ESI-discount. Two conditions will be applicable: <ol style="list-style-type: none"> 1. at the actual time of arrival (ATA) the vessel must have an ESI score of 31 points or more and 2. the ship called at the port of Rotterdam in the quarter concerned. The discount applies to each call in the quarter concerned, with a maximum of 20 calls per single ship per quarter; The discount will be doubled if the ship also has an individual ESI-NOx score of 31.0 or more.

Source: COGEA (2017) and own elaboration based on Port of Rotterdam 2018 pricelist

Port of Stockholm

Country	Sweden
Geographic location	Baltic Sea
Ownership/governance	Municipality
Owner of the land	Municipality
Terminals operated by	Private company
Environmental charging scheme based on	Other
Scheme description	<p>A funding contribution of SEK 1 million will be offered to every vessel that carries out restructuring work to enable the vessel to connect to electricity at the quayside. This applies for the quays where Ports of Stockholm offers quayside electricity connection capabilities.</p> <p>The port fee for LNG vessels will be discounted by 5 öre per unit of gross tonnage. For a vessel of the size of Viking Grace, calling at Stockholm daily, this amounts to a rebate of around SEK 1 million annually. For a vessel calling at Stockholm every second day the rebate will be around SEK 500 thousand annually.</p> <p>The discount for reduced emission of nitrous oxide will follow the seven-level scale applied by the Swedish Maritime Administration. For a normal-sized vessel operating daily calls this will mean a discount of between SEK 3 million to SEK 4 million annually, depending on the amount of nitrous oxide emissions.</p>
Port certified with	ISO 140001

Source: COGEA (2017)

Port of Tallinn

Country	Estonia
Geographic setting	Coastal port
Geographic location	Baltic Sea
Ownership/governance	State
Owner of the land	Port authority
Terminals operated by	Private company
Port specialisation	<p>Passenger (non cruise): > 7 mln/ year</p> <p>Passenger (cruise): < 1mln/ year</p> <p>Liquid bulk: 15 < 25 mln tonnes/ year</p> <p>Dry bulk: < 5 mln tonnes/ year</p> <p>RoRo: < 5 mln tonnes/ year</p>
Environmental charging scheme based on	LNG use/ frequency of visits/waste
Scheme description	<p>A vessel using LNG as the main fuel has the right to apply for a 4% tonnage charge discount. The port owner has the right to ask for evidence for the fuel type used at the vessel. All other discounts from tonnage charge are calculated based on the tonnage charge rate which is reduced by the LNG discount (first the LNG discount is subtracted from the base rate and after that all other discounts).</p> <p>Frequent visits: discounts from tonnage charge for cruise ships for each calendar year separately: after 2nd-3rd call: 35%, 4-5th call: 55%, from 6th call: 65%.</p> <p>A discount of 9,38% on the waste fee is applied to cruise ships that collect garbage separately by types, in case at least one type of recyclable garbage (excluding mixed domestic waste) listed in MARPOL Annex V (garbage) is discharged. Lowered rate does not apply if a ship does not collect garbage listed in MARPOL Annex V separately by types or does not discharge any garbage at a port (including garbage listed in MARPOL Annex V). Lowered rate is always applied in Saaremaa harbour</p>
Authority in charge of the scheme	Port authority. There is autonomy in tariff setting
Incentives for terminal operators or other stakeholders	<p>Development of software application Mairis for prompt information and notification system in order to prevent exceeding the permitted limits outdoor air pollutants in Muuga harbor.</p> <p>Development of outdoor air monitoring in the western part of Muuga harbor. in cooperation with oil operators development of an environmental management system etc.</p>
Port certified with	ISO 140001 certification

Source: COGEA (2017) and own elaboration based on Port of Tallin 2018 pricelist