



GREEN PORT INFRASTRUCTURE PRICING



THE CURRENT SITUATION AND CHALLENGES AHEAD

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Providers of large-scale transport infrastructure are under increasing pressure to regulate the behavior of their users, in particular towards sustainable development objectives related to the environment. Just like airport managing companies apply environmental factors such as noise emission parameters of aircraft into their airline pricing schemes, port authorities have been applying various schemes to provide green incentives to their users, mainly shipping lines, to reduce the environmental impacts of their operations.

The main driver for these developments are the global climate objectives set out during global climate conferences (Kyoto 1997 and follow-up meetings, and more recently COP 21 in Paris) where maritime transport has been identified as

a significant contributor to air emissions. At present, according to IMO research, maritime shipping is held accountable for 2.5% of global greenhouse gas emissions, with an increase foreseen of 50% to 250%, by 2050. The potential reduction to be achieved both by operational measures and investments in new technology, according to IMO studies, amounts to 75%.

CLIMATE CHANGE: THE ROLE OF PORTS

As ports are crucial nodes in the logistics chain, they are affected in different ways by the current situation. First, following transnational global climate agreements, national, regional and city governments are looking towards ports to contribute to the reduction of various air emissions, in particular greenhouse gasses. While on the level of industrial activities in port

areas, significant improvements have been achieved, the maritime transport / logistics chain has somewhat lagged behind in achieving similar rates of emission reduction (in relative terms). Port authorities, as local regulators of port areas, are expected by higher government levels to take initiatives and integrate ambitious goals within local, regional and national emission reduction schemes.

Second, local communities are increasingly aware of the health effects of maritime and hinterland mode transport emissions on a local level such as NOx, SOx and PM10 (fine particles), and are blocking further port infrastructure developments on these grounds, as well as attacking the social license to operate of port areas.

As a result, port authorities are forced to develop strategies towards

their customers, providing incentive frameworks to stimulate the adoption of more environmentally friendly behaviour. These elements have led to the creation of a global initiative under the umbrella of the IAPH, named the WPCI (World Ports Climate Initiative), along earlier industry arrangements such as e.g. the European ECOPORTS initiative.

One of the specific areas which has gained attention is green port infrastructure charging, oriented towards shipping lines calling the port, i.e. integrating environmental parameters in the calculation of port, navigation or harbour dues collected by the port managing body. This interest is confirmed as the recently released results from the ECOPORTS survey show that 62% of ECOPORTS members (mainly European ports) have a green charging/pricing system in place. Recent research (from 2015-2016) in a study commissioned by the European Commission (DG MOVE) has shed more light on the main strategic issues surrounding the topic.

VARIETY AND CHOICE OF SCHEMES

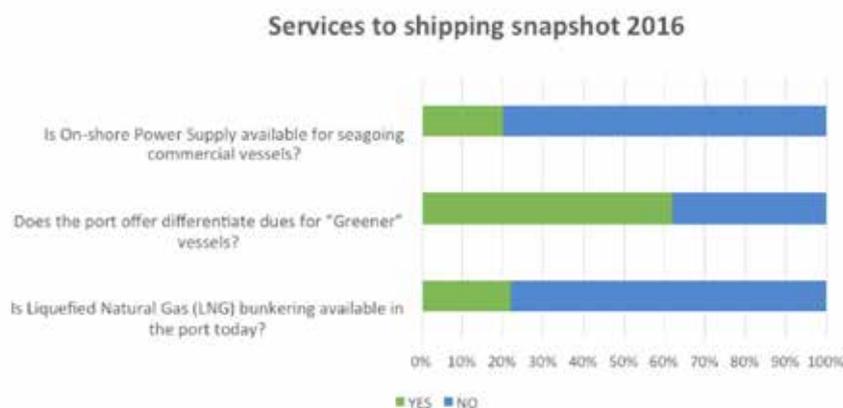
Decisions on the adoption of a particular scheme need to be taken on two levels. First, a port managing body needs to decide whether the scheme is purely “positive incentive”-based or whether a bonus/malus system is applied. Under the hypothesis of a bonus/malus system, this would imply setting a yardstick to which the environmental performance of all ships calling the port would be assessed, and subsequently some customers would be pay more (the customers more polluting than the yardstick), and some less (the customers performing better than the yardstick).

A positive incentive system, on the contrary, starts from the hypothesis that all ships calling at a port are compliant with minimum environmental regulations (following legally binding conventions), and that only behavior beyond compliance is rewarded by a discount on port dues.

The second level of decision is to determine the underlying environmental parameters, or more broadly the specific environmental scheme applied. One successful example of a scheme, adopted by around 40 ports worldwide and with currently more than 4.500 ships registered, is the so-called Environmental Ship Index scheme (ESI) developed under the umbrella of the IAPH.

The ESI starts to score ships at the level of compliance and participating port managing bodies are able to develop incentive schemes for ships beyond compliance. The strength of the system is its limited cost for participating port

Figure 1: take-up of green services to shipping in European ports



Source: PORTOPIA, 2016, based on the ECOPORTS survey

authorities and shipping lines, and its flexibility with regard to implementation.

Port managing bodies are independently able to determine the scope and field of application, e.g. the development of ESI performance tiers within the pricing structure, the minimum level of ESI-score to get discounts, the types of cargo markets, and so forth. Other schemes applied by port managing bodies are the Green Award, Rightship, the Clean Shipping Index and Blue Angel, of which some are based on independent certification of vessels, and somewhat more costly to shipping lines (as audits and inspections are required), but also more comprehensive as they integrate elements of safety / security compliance and management procedures.

Some ports combine different schemes and/or add other bonus schemes, such as introducing additional discounts for superior performance within certain emission categories more salient on a local level (e.g. PM10), or vessel or operational features, e.g. the use of LNG fuel.

THE FINANCES OF PORT AUTHORITIES

While port dues are rather insignificant within the total cost of the supply chain (cargo handling and hinterland transport e.g. being much larger cost components), they are a very important source of revenue of port managing bodies, serving to repay both the operational costs of the port managing body, and more importantly, maintenance and investment cost in basic port infrastructure.

For landlord port authorities, port dues often represent 40% or more of the total revenue stream (along concession or lease fees, and some other revenues). As a result, decisions regarding the implementation of green pricing are not

only highly complex, but might also heavily influence the financial situation of port managing bodies, in particular if a rebate structure is applied without compensation or recalibration of the pricing structure via other (commercial) parameters.

Research within the Hamburg-Le Havre port range shows that currently circa 0.5% to 1% of total port dues are spent within or reserved for green incentive schemes. The research also shows that decision-making is a multidisciplinary affair, with multiple departments (environment, finance, commercial department) being involved, and final decisions within the management committee or board of directors.

In sum, while larger port managing bodies have the internal competences and resources to make detailed assessments, small to medium size ports might be reluctant to engage in green pricing due to their smaller financial resource bases, as well as the necessary analytical capacity to design, evaluate and monitor a green pricing scheme.

Insights from our research show that, for example, ESI applying ports have almost annually reviewed and adapted the scheme since its first application in 2011. Overall internal administrative costs of port managing bodies to operate the scheme are estimated at 0.5 to 3 full-time equivalents (including the additional administrative process costs), depending on the degree of automation of processes, as well as the monitoring capacity.

AUTONOMY OF PORT MANAGING BODIES

A substantial amount of port managing bodies need to submit pricing scheme alterations to higher governmental bodies, and on the level of the management committee or board, are not fully autonomous for price setting. The same is

Figure 2: Generic Types of Green Pricing Schemes

Alternative	Implementation	Decision Parameters
a) Rebate	Fixed amount	Amount allocation criteria
	Percentage rebate on Gross Tonnage	Selection of index/certification % tier levels
	Percentage rebate on Gross Tonnage and cargo	Selection of index/certification % tier levels
	Tier system	Tier levels
b) Charge	Direct charge	Charge determination
	Redistribution scheme	Charge determination
c) Fund	Charging and redistribution scheme	Charge determination Redistribution scheme

Source: Cogeia - VUB – KLU – Glintt consortium (2015)

valid for the overall financial management and budget approval. As a result, the introduction and subsequent alteration of green pricing schemes might be difficult to achieve in administrative or even political terms.

Some port managing bodies have therefore opted to keep environmental parameters outside of their actual pricing schemes, and have developed a separate (fixed) fund within the annual budget allocation, which is redistributed at the end of a fiscal year as a kind of ‘premium’ to the best performing customers.

IMPACT OF SCHEMES

Most port managing bodies acknowledge that incentive schemes do not directly alter the behaviour of their customers in the short run through, for example, investments in green technology on current ships or changes in the ship portfolio calling at a port. However, financial calculations show that the incentive could potentially finance the use of cleaner fuel in and around port areas, and that if a containership calls at multiple ports with an incentive scheme on the same loop, a substantial rebate can be obtained (however not enough to fully finance new green technologies or refits).

This is confirmed by the increased take-up of the schemes in terms of the number of vessels (as reported by some ports). According to the surveyed ports, the green pricing schemes do send strong signals to the market and are expected to have mid-to-long-term results as the green pricing schemes are factored in within decision processes on new ship investments (e.g. on the adoption of LNG fuel).

In conclusion, we observe an increasing

role of port managing bodies as ‘signal callers’ in the context of the greening of maritime transport. However, against a background of fierce competition between ports as well as limited financial resources, the actual leverage of port managing bodies seems limited, at least in the short run.

When it comes to maritime transport, more global solutions on the level of the IMO and/or flag states (e.g. differentiated tonnage taxes based on vessel environmental performance) could and probably should be envisaged, if shorter term results are needed. Of

course, port authorities are also able to pull other levers and/or activate other stakeholders, e.g. on the level of waste collection fees, provision of cold ironing, as well as provisions within concession contracts (e.g. modal split objectives, use of environmentally friendly technology such as electric vehicles, etc). In sum, our research shows that stakeholders are faced with complex and challenging decision processes, both on the micro- and macro-economic level, to ensure that maritime shipping contributes its part on local and global climate agendas.

ABOUT THE AUTHORS

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ABOUT THE ORGANISATION

PortEconomics is a web-based initiative aiming at generating and disseminating knowledge about seaports. It is developed and empowered by the members of the PortEconomics group, who are actively involved in academic and contract research in port economics, management, and policy. Since October 2012, Port Technology International and PortEconomics have been engaged in a partnership. www.porteconomics.eu

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