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Seaport CSR : innovation for economic, social and environmental objectives

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SEAPORT CSR: INNOVATION FOR ECONOMIC, SOCIAL AND ENVIRONMENTAL OBJECTIVES

1. INTRODUCTION: OBJECTIVES AND METHODOLOGY

Till now, corporate social responsibility (CSR) in seaports has not really received visible attention in academic literature. That is in contrast to wider applications of CSR research to other economic sectors (see e.g. Malik, 2013), and also in general business practice, as CSR is a concept that was introduced in the early seventies. Certain aspects do get attention though, in a fragmented way, in the recent literature related to ports. It can be derived as a common denominator from the wider academic CSR literature that CSR covers three main fields: economic, social and environmental issues. Environmental sub-issues for instance lately covered in seaport-related research involve port pollution (e.g. Homsombat et al., 2013) and clean hinterland transport (e.g. Clott and Hartmann, 2013). Environmental management or measurement in seaports is also treated more generally (e.g. Chang, 2013). Economic issues have been dealt with for most long, under the umbrellas of for instance port efficiency (e.g. Felicio and Calderinho, 2013; Lee et al., 2013; Schoyen and Odeck, 2013; Barros et al., 2012) or port hinterland optimisation (e.g. Iannone, 2013). The social aspect clearly has been underperforming as to academic literature attention.

Hardly ever in port-related literature has an integration of the analyses from different categories of issues been performed. Two of the only recent academic references combining economic and environmental objectives are Haralambides and Gujar (2013) and Lam and Gu (2013). For that reason, there is no real view on the extent to which CSR is actually on the agenda in seaports, and how that is done.

This paper tries to provide some answer to that lack in academic literature, by testing the presence and success of CSR in the port sector. The objective is then to test what type of innovation initiatives are typically taken from a CSR viewpoint in seaports, what the main goals are that are aimed for, and to what extent these goals are actually being achieved by the CSR initiatives. A case study is made to two ports (Antwerp and Rotterdam) and a comprehensive set of innovation initiatives. In order to reach the above-stated objective, a methodology consisting of two broad steps is applied, with sub-steps to be taken. That also determines the further structure of the paper.

First, literature research is conducted, with the aim of finding a common definition of CSR, and in particular a common 'CSR measurement system'. To

do that, both academic and policy literature is consulted, all of them international. The overview of the literature and derived observations is presented in section 2.1. Out of that search comes a split up of goals and sub-goals in three main fields, represented by indicators each time. The resulting scheme is input to the work of the next sub-section.

Next, a Delphi exercise is conducted among the selected port-related companies. With that exercise, starting from the objective scheme developed through the literature search, the scheme is submitted to seven private and public companies active in the ports of Antwerp and/or Rotterdam and featuring a clear CSR policy, for their suggestions on correction and improvement. The companies belong to different business activities, that all have a clear link with the port: DAB Vloot, Air Liquide, Jan De Nul Group, BASF, Port of Rotterdam, Total and Hydrex. Their nature and characteristics will be made further explicit in section 2.2. The feedback is gained twice from the companies: first to get feedback on the scheme resulting from section 2, and a second time to get feedback on an updated scheme after the first round of company questioning. The scheme resulting from that analysis is presented in section 2.3.

Further on, a scoring is asked from the companies on the extent to which the specific goals and subgoals are relevant to them in conducting their CSR policies. That scoring is presented in section 2.4. A 'yes' or 'no' system is applied to detect relevance, as a pilot interview showed that having further differentiation led to inconsistent scorings.

Then the paper turns to a specific innovation that is selected for each of the seven companies. The innovations are identified as key to the companies, and are described in section 3.1. The companies were then asked to score the innovations on their materialized impact on the various goals and sub-goals. Section 3.2 presents the results of the scoring, and analyses the innovations apparently performing best.

Section 4 then checks the consistency between the importance of the various CSR goals, and the degree of success in contributing to that objective through the selected innovation. To do that, the degree of homogeneity of both the objective scoring and the innovation scoring are determined, and those two are then compared.

Finally, in section 5, conclusions are drawn, and suggestions for further research are indicated.

2. CORPORATE SOCIAL RESPONSIBILITY OBJECTIVES

2.1. CSR BACKGROUND AND LITERATURE REVIEW

In 1976, the OECD introduced its Guidelines for Multinational Enterprises. The Guidelines have always been meant to function as the leading international instrument for the promotion of responsible business conduct. These were reviewed five times in the meantime, and in 2011 for the last time. The most recent changes include the introduction of a human rights chapter, a new approach to due diligence and responsible supply chain management, and updates with respect to employment, environment, bribery, consumer interests and taxation issues. The updates were checked with a wide group of stakeholders, exceeding by far the own OECD members. (OECD, 2011)

Younger, but according to its own saying the largest voluntary corporate responsibility initiative in the world, with over 10,000 corporate participants and other stakeholders from over 130 countries, is the UN Global Compact (United Nations Global Compact Office, 2010). It is a strategic policy initiative for businesses that are committed to aligning their operations and strategies with ten universally accepted principles, relating to human rights, labour, environment and anti-corruption. Overall, the UN Global Compact deals with highly similar issues as does OECD. Largely, the Compact is in line with the UN's Guiding Principles on Business and Human Rights.

The European Commission introduced a definition of CSR as they would like to see it applied by companies active in Europe. They define CSR as "*the responsibility of enterprises for their impacts on society*" (European Commission, 2011, p. 6). The definition gets translated in an action plan, running from 2011 to 2014. The action plan has following purposes: enhancing the visibility of CSR and disseminating good practices, improving and tracking levels of trust in business, improving self- and co-regulation processes, enhancing market reward for CSR, improving company disclosure of social and environmental information, further integrating CSR into education, training and research, and emphasising the importance of national and sub-national CSR policies. The European CSR policy is aligned with the above-mentioned initiatives, and with the ILO Tri-partite Declaration of Principles on Multinational Enterprises and Social Policy.

The International Standardization Organization developed the ISO 26000 scheme for Social Responsibility, which, in contrast to other ISO certification schemes, provides guidelines rather than requirements. The latter involve human rights, labour practices, environment, fair operating practices,

consumer issues and community involvement and development. The guidelines were developed in 2010. (International Organization for Standardization, 2013).

None of the above-mentioned sources seem to offer an operational checking scheme with defined CSR objectives or measures. The Dutch Stichting Stimular (2013), focusing on companies operating in a sustainable way, did so. Its 'MVO-balans', a checklist on CSR, covers three main fields: economic, social and environmental objectives. The economic component is composed of a return item, and a chain one. The social component involves a security item, and a societal one. Their checklist is taken as a start for the analysis in this paper.

In the academic literature, Abreu and Barlow (2013) take a wide approach, comparing internationally the CSR approaches and objectives of leading companies. Recent work by El Ebrashi (2011) is useful with respect to social objectives. Leite and Padgett (2011) show how CSR over time has evolved from doing charity to society, over attention to social changes and challenges, to business strategies encompassing a wider set of goals. With economic and financial arguments in mind due to the 2008 economic and financial crisis, the approach and findings of Lauesen (2012) are relevant. Finally, Gill (2012) provides interesting perspectives on environmental responsibility. Additions, qualifications and modifications are made to the Dutch Stichting Stimular's objectives checklist with the help of the above-mentioned academic literature.

In the next section, the companies are shown to which the objectives were submitted for a Delphi analysis. The resulting items and their concrete objectives, starting from the modified Dutch Stichting Stimular's CSR checklist, are presented in section 2.3.

2.2. SELECTED COMPANIES

The selection of port-related companies, two whom the literature list of CSR objectives was submitted, is on purpose mixed, reflecting the diversity of activities present in seaport areas, and being representative for the large sectors generating employment, value added and investments in the port. The companies are briefly described below, to show their characteristics and linkage with ports.

DAB Vloot

DAB Vloot is a sub-entity of the Flemish Government, in charge of managing the region's sea-going vessels, 45 in total, used for pilotage, hydrography, beaconing, patrolling, customs, salvage, research, towage and ferrying. Its territory is the North Sea, the river Scheldt, two docks in the ports of Antwerp and Ghent respectively, and one inland waterway stretch.

Air Liquide

Air Liquide is a French multinational, world leader in the delivery of industrial and medical gases, and ancillary services. The company is active in 80 countries and quoted on the Euronext stock market. In Belgium, the company has about 25,000 customers, served through 250 depots.

Jan De Nul Group

Jan De Nul Group is a Belgian company, mainly known as one of the four core dredging companies in the world, but also active in civil construction and environmental engineering. Its dredging activities involve seaports, channels, and sandbanks at full sea. Furthermore, also off-shore activities are performed. Civil works comprise public and private construction. Soil and soil water sanitation compose a third activity. Among the projects are the widening of the Panama Canal and the construction of the dredging waste site Amoras in Antwerp.

BASF

BASF is world leader in the chemical market. BASF Antwerp is Belgium's largest integrated chemical production centre, and the group's second largest production platform behind Ludwigshafen am Rhein. BASF offers a range of products, from plant protection and feeding, chemical product, synthetics and fibres, colour and grading up products, to oil and gas.

The Port of Rotterdam

The Port of Rotterdam is the biggest port in Europe, and the third port globally. In containers, its largest commodity group, the port is ranked 10th globally. It is strategically located at full sea at relatively close distance of the large Western-European hinterland. The Port of Rotterdam is an independent public limited company, not quoted on the stock exchange, but with two shareholders: the City of Rotterdam and the Dutch State. The Port has a landlord nature, but also performs functions as a regulator and operator. It rents out land under concession to operators inside the port.

Total

Total is a French petrol distributor founded in 1924, having grown enormously through the takeovers of Petrofina (1999) and Elf Aquitaine (2000). Through that expansion, the group is the world's fifth largest player in the market. The company is active both upstream (detecting oil stocks) and downstream (refinery and distribution). Total's most complex refinery, and actually the second largest refinery overall in Europe, is located in the port of Antwerp.

Hydrex

Hydrex was founded in 1974 and is known for underwater repair and replacements. One of the key developments is to improve ships' hull performance, so as to optimize ship performance. In the meantime, the company received various international awards in recognition of their inventions and sustainable alternatives.

2.3. CSR OBJECTIVES RESULTING FROM LITERATURE AND COMPANY REVIEW

This section summarizes the objectives as resulting from the literature review and the company assessment.

Economic CSR objectives

Economic return objectives encompass the classical financial ratios, supplemented with the cost of material inputs and transport (table 1). On the product side, sustainability is considered both on the selling and purchasing side.

Table 1: Selected economic CSR objectives

- Return
 - Turnover
 - Liquidity
 - Solvability
 - Profitability
 - EBITDA
 - Cost of energy, water, waste and transport (% of turnover)
- Selling sustainable products/services
 - Percentage offers with sustainable options
 - Share of sustainable products or services in the assortment
 - Percentage of turnover related to sustainable products or services
 - Share of complaints about products and services
- Sustainable purchasing

- Purchasing costs of raw materials x or material y per euro of turnover
- Percentage of purchasing budget in which environmental and social criteria are assumed
- Percentage of suppliers and service providers with whom agreements are made about environmental and social affairs
- Share of purchased raw materials that is judged on presence of dangerous products

Source: own composition

Social CSR objectives

Social return objectives involve mainly security and well-being, of which training is an important aspect (table 2).

Table 2: Selected social CSR objectives

- Security
 - Number of (near-)accidents without personal damage
 - Number of accidents with personal damage
 - Number of accidents with work leave
 - Number of dangerous goods in the company
 - Number of IMO containers
 - Number of improvement points from the annual RI&E
 - Number of environmental incidents
- Healthy employees
 - Percentage of short leave
 - Percentage of medium leave
 - Percentage of long leave
- Happy employees
 - Happiness of employees
 - Percentage of staff turnover
- Employee training
 - Share of number of hours of training (% of company hours)
 - Share of number of hours of training focused on sustainability (% of company hours)
 - Share of training costs in total company costs
 - Percentage of employees that follows individual training
- Employee diversity
 - Percentage of women in service
 - Percentage 15-30 years old
 - Percentage 30-45 years old
 - Percentage 45-67 years old
 - Share of employees with less chances on the employee market (% of staffing)
 - Share of employees with non-European nationality / origin

- Society
 - Share of local suppliers and/or providers (within a range of x kilometres)
 - Number of complaints about nuisance
 - Share of employees that contribute to annual volunteer activities of the company
 - Share of supplied capital, facilities and human power for sustainable goals (% of turnover)
 - Share of internship and training places (% of staffing)

Source: own composition

Environmental CSR objectives

On the environmental side, energy, climate and waste are involved (table 3).

Table 3: Selected environmental CSR objectives

- Energy and climate
 - Electricity usage
 - Percentage sustainably developed electricity
 - Percentage sustainably developed heat
 - Gas or water usage
 - CO₂ emission
- Waste
 - Waste separation / recycling share
 - Total waste per employee
- Traffic and transport
 - Fuel usage business traffic per EURO of turnover
 - Percentage of company cars with label A or B
 - Fuel usage of freight trucks per EURO turnover
 - Percentage of freight trucks with at least EURO 5 engines
 - Home-work kilometres per employee
 - Percentage public transport and bike in home-work transport
 - Share of home work
 - Promoting expenses for using public transport

Source: own composition

2.4. IMPORTANCE OF THE RESPECTIVE CSR OBJECTIVES

As part of the Delphi exercise, the selected companies were asked to score the CSR objectives on their relevance to the company's CSR policy. Their scores can be found in table 4, where the column '0' indicates the share of respondents that found the specific objective irrelevant within their CSR policy, whereas '1' mirrors the share of respondents attaching relevance to the objective.

It is found that overall, social objectives are deemed most relevant (average score 51%, mean 57%), followed by economic objectives (average score

47%, mean 43%), and with environmental objectives being least important (average score 39%, mean 29%). In all, the most relevant objectives turn out to be turnover (economic) and CO₂ emissions (environmental). Judged irrelevant with respect to their CSR policies are the 'percentage of purchasing budget in which environmental and social criteria are assumed', 'number of improvement points from the annual RI&E', 'share of employees with less chances on the employee market (% of staffing)', 'share of local suppliers and/or providers (within a range of x kilometres)', and 'fuel usage of freight trucks per EURO turnover'.

Table 4: Importance of the selected CSR objectives

Main objective	Sub-objective	0	1
Economic			
□ Return			
	□ Turnover	0%	100%
	□ Liquidity	14%	86%
	□ Solvability	14%	86%
	□ Profitability	29%	71%
	□ EBITDA	29%	71%
	□ Cost of energy, water, waste and transport (% of turnover)	57%	43%
□ Selling sustainable products/services			
	□ Percentage offers with sustainable options	86%	14%
	□ Share of sustainable products or services in the assortment	71%	29%
	□ Percentage of turnover related to sustainable products or services	86%	14%
	□ Share of complaints about products and services	43%	57%
□ Sustainable purchasing			
	□ Purchasing costs of raw materials x or material y per euro of turnover	86%	14%
	□ Percentage of purchasing budget in which environmental and social criteria are assumed	100%	0%
	□ Percentage of suppliers and service providers with whom agreements are made about environmental and social affairs	71%	29%
	□ Share of purchased raw materials that is judged on presence of dangerous products	57%	43%
Social			
□ Security			
	□ Number of (near-)accidents without personal damage	57%	43%
	□ Number of accidents with personal damage	14%	86%
	□ Number of accidents with work leave	29%	71%
	□ Number of dangerous goods in the company	43%	57%
	□ Number of IMO containers	86%	14%
	□ Number of improvement points from the annual RI&E	100%	0%
	□ Number of environmental incidents	43%	57%

□ Healthy employees			
□ Percentage of short leave		43%	57%
□ Percentage of medium leave		71%	29%
□ Percentage of long leave		57%	43%
□ Happy employees			
□ Happiness of employees		29%	71%
□ Percentage of staff turnover		43%	57%
□ Employee training			
□ Share of number of hours of training (% of company hours)		14%	86%
□ Share of number of hours of training focused on sustainability (% of company hours)		43%	57%
□ Share of training costs in total company costs		29%	71%
□ Percentage of employees that follows individual training		29%	71%
□ Employee diversity			
□ Percentage of women in service		29%	71%
□ Percentage 15-30 years old		43%	57%
□ Percentage 30-45 years old		43%	57%
□ Percentage 45-67 years old		43%	57%
□ Share of employees with less chances on the employee market (% of staffing)		100%	0%
□ Share of employees with non-European nationality / origin		71%	29%
□ Society			
□ Share of local suppliers and/or providers (within a range of x kilometres)		100%	0%
□ Number of complaints about nuisance		57%	43%
□ Share of employees that contribute to annual volunteer activities of the company		57%	43%
□ Share of supplied capital, facilities and human power for sustainable goals (% of turnover)		29%	71%
□ Share of internship and training places (% of staffing)		14%	86%
Environmental			
□ Energy and climate			
□ Electricity usage		14%	86%
□ Percentage sustainably developed electricity		29%	71%
□ Percentage sustainably developed heat		86%	14%
□ Gas or water usage		43%	57%
□ CO ₂ emission		0%	100%
□ Waste			
□ Waste separation / recycling share		57%	43%
□ Total waste per employee		57%	43%
□ Traffic and transport			
□ Fuel usage business traffic per EURO of turnover		71%	29%
□ Percentage of company cars with label A or B		86%	14%
□ Fuel usage of freight trucks per EURO turnover		100%	0%
□ Percentage of freight trucks with at least EURO 5		86%	14%

engines		
<input type="checkbox"/> Home-work kilometres per employee	71%	29%
<input type="checkbox"/> Percentage public transport and bike in home-work transport	71%	43%
<input type="checkbox"/> Share of home work	86%	14%
<input type="checkbox"/> Promoting expenses for using public transport	71%	29%

Source: own composition

3. PORT INNOVATION INITIATIVES IN CSR

This section subsequently introduces the innovation initiatives that will be used in the test, and the scores obtained as to how well the initiatives contribute to obtaining the various sub-objectives.

3.1. INNOVATION CASES

For each of the companies dealt with in the previous section, one innovation was selected, for which the CSR impact will further on be tested. The selected innovation actions are described below. They compose a mixture of more technological and more process-oriented innovation initiatives.

DAB Vloot: SWATH vessels

SWATH stands for 'Small Waterplane Area Twin Hull' ship. It is a vessel type that has two hulls, and through that combines a minimum contact area with the waterline with a maximum stability, thereby not suffering from tidal impacts, and being able to reach high speeds, also in very bad weather conditions.

Air Liquide: safety innovation

Improving safety has become a key point for Air Liquide, and can therefore be considered a process innovation within the company, both for employees and subcontractors. In 2005, the company launched its 'Industrial Management System'. Key features of the vision behind are: prevention, protection, early detection and quick action. The process involves a risk analysis and an awareness campaign. In 2012, Air Liquide Belux was the pilot entity within the group for the 'Life Savings Rules' project, within which employees have to respect 12 key rules, under threat of dismissal.

Jan De Nul Group: Simon Stevin

Simon Stevin is Jan De Nul's largest fall pipe and mining vessel, acquired 2010. It can carry 35,000 tonnes, process 2,000 tonnes per hour, and is meant to do rock deposits at high depth (up to 2,000m).

BASF: water cleaning

In chemical processes, quite some water is used, which contains pollutants, hence cannot be disposed of directly in nature. Water clearing happens in four steps: (i) sifting and neutralizing, (ii) aerofication, (iii) slib sinking, (iv) covering and resting.

The Port of Rotterdam: Plant One

The innovation considered for the Port of Rotterdam is Plant One, a test facility for sustainable and innovative process technologies, founded by the Port, together with Deltalinqs (the private port operators' association), TNO (the Dutch official research institute) and Rotterdam World Climate Initiative. The aim is to function as a link between laboratory and real-life application. Doing so should contribute to the Port's ambition to reduce CO₂ emissions by 50% by 2025, as compared to 1990.

Total: reducing dock spills

One of the key innovation projects within Total is reducing oil spills when transferring oil between modes. The project is split up in six phases, five of which have been run through by now. One of the shifts is from passive to active securitization. That implies that operators need to perform an attendance confirmation every 10 minutes. Furthermore, vapor recovery is performed, in a specific unit, that allows reusing emitted vapors.

Hydrex: Ecospeed

Ecospeed is a hard, inert coating, used for vessel hulls. Advantages are the absence of damage, no release of harmful products, and the possibility of cleaning under water, which increases the speed by which operations can happen. Ecospeed has a life expectancy of 25 years, and has anti-corrosive properties.

3.2. INNOVATION IMPACT SCORING

This section presents the scoring given by the seven operators on how well they achieve the various objectives. A 3-point scale is applied, where '0' means no achievement at all, whereas '3' means very satisfactory achievement (table 5). It seems that the social objectives are best being achieved, followed by economic and environmental objectives. This is in line with the relative importance of the three types of objectives, as analysed in section 2.4. Best achievable seem the 'number of dangerous goods', 'share of

number of hours of training’ and ‘percentage of employees that follows individual training’. Of the latter, only the ‘share of number of hours of training’ was deemed very relevant by the companies, as resulting from section 2.4. Of the objectives judged overall very important as in section 2.4, only ‘CO₂ emissions’ seems to be very well achieved through innovation initiatives.

Table 5: Innovation success scores

Main objective	Sub-objective	0	1	2	3
Economic					
□ Return					
	□ Turnover	0%	29%	43%	29%
	□ Liquidity	43%	14%	0%	0%
	□ Solvability	43%	14%	0%	0%
	□ Profitability	29%	14%	0%	0%
	□ EBITDA	29%	14%	0%	0%
	□ Cost of energy, water, waste and transport (% of turnover)	43%	29%	29%	29%
□ Selling sustainable products/services					
	□ Percentage offers with sustainable options	86%	14%	0%	0%
	□ Share of sustainable products or services in the assortment	43%	29%	14%	14%
	□ Percentage of turnover related to sustainable products or services	71%	14%	14%	0%
	□ Share of complaints about products and services	43%	14%	29%	14%
□ Sustainable purchasing					
	□ Purchasing costs of raw materials x or material y per euro of turnover	86%	0%	14%	0%
	□ Percentage of purchasing budget in which environmental and social criteria are assumed	86%	14%	0%	0%
	□ Percentage of suppliers and service providers with whom agreements are made about environmental and social affairs	57%	29%	14%	0%
	□ Share of purchased raw materials that is judged on presence of dangerous products	57%	14%	14%	14%
Social					
□ Security					
	□ Number of (near-)accidents without personal damage	29%	29%	29%	14%
	□ Number of accidents with personal damage	14%	29%	29%	29%
	□ Number of accidents with work leave	29%	14%	29%	

					29%
	□ Number of dangerous goods	43%	14%	0%	43%
	□ Number of IMO containers	86%	14%	0%	0%
	□ Number of improvement points from the annual RI&E	100%	0%	0%	0%
	□ Number of environmental incidents	43%	0%	0%	29%
□ Healthy employees					
	□ Percentage of short leave	43%	14%	29%	14%
	□ Percentage of medium leave	43%	14%	29%	14%
	□ Percentage of long leave	43%	29%	29%	0%
□ Happy employees					
	□ Happiness of employees	29%	29%	43%	0%
	□ Percentage of staff turnover	71%	14%	14%	0%
□ Employee training					
	□ Share of number of hours of training (% of company hours)	29%	0%	29%	43%
	□ Share of number of hours of training focused on sustainability (% of company hours)	14%	29%	29%	29%
	□ Share of training costs in total company costs	29%	14%	43%	14%
	□ Percentage of employees that follows individual training	43%	0%	14%	43%
□ Employee diversity					
	□ Percentage of women in service	43%	57%	0%	0%
	□ Percentage 15-30 years old	43%	43%	14%	0%
	□ Percentage 30-45 years old	43%	29%	29%	0%
	□ Percentage 45-67 years old	43%	29%	29%	0%
	□ Share of employees with less chances on the employee market (% of staffing)	86%	14%	0%	0%
	□ Share of employees with non-European nationality / origin	57%	14%	29%	0%
□ Society					
	□ Share of local suppliers and/or providers (within a range of x kilometres)	100%	0%	0%	0%
	□ Number of complaints about nuisance	43%	0%	29%	29%
	□ Share of employees that contribute to annual volunteer activities of the company	100%	0%	0%	0%
	□ Share of supplied capital, facilities and human power for sustainable goals (% of turnover)	57%	43%	0%	0%
	□ Share of internship and training places (% of staffing)	43%	0%	43%	14%
Environmental					

□ Energy and climate				
□ Electricity usage	14%	29%	43%	14%
□ Percentage sustainably developed electricity	29%	29%	29%	14%
□ Percentage sustainably developed heat	43%	14%	29%	14%
□ Gas or water usage	43%	14%	14%	29%
□ CO ₂ emission	0%	29%	14%	57%
□ Waste				
□ Waste separation / recycling share	43%	14%	14%	29%
□ Total waste per employee	71%	29%	0%	0%
□ Traffic and transport				
□ Fuel usage business traffic per EURO of turnover	100%	0%	0%	0%
□ Percentage of company cars with label A or B	100%	0%	0%	0%
□ Fuel usage of freight trucks per EURO turnover	100%	0%	0%	0%
□ Percentage of freight trucks with at least EURO 5 engines	100%	0%	0%	0%
□ Home-work kilometres per employee	86%	14%	0%	0%
□ Percentage public transport and bike in home-work transport	86%	14%	0%	0%
□ Share of home work	86%	14%	0%	0%
□ Promoting expenses for using public transport	86%	14%	0%	0%

Source: own composition

4. OBJECTIVE IMPORTANCE VERSUS INNOVATION SUCCESS

This section compares the objective importance with the innovation success. It therefore first calculates a homogeneity index. It does so by calculating the squared sum of shares of the various possible replies, both for the objective relevance and the innovation success:

$$h_i = \sum_j f_{ij}^2$$

Out of that h value, a homogeneity index is derived, by applying the below formula for objective scoring:

$$H_i = \frac{h_i - \min(h_i)}{\max(h_i) - \min(h_i)} = \frac{h_i - 0.50}{0.50}$$

For the innovation success scoring, the below formula results:

$$H_i = \frac{h_i - \min(h_i)}{\max(h_i) - \min(h_i)} = \frac{h_i - 0.25}{0.75}$$

A high H value is an indication of homogenous answers by the respondents, whereas a low value indicates dispersion in the answers. For the objective relevance (H obj), full homogeneity is found for 'turnover', 'percentage of purchasing budget in which environmental and social criteria are assumed', 'number of improvement points from the annual RI&E', 'share of employees with less chances on the employee market', 'share of local suppliers and/or providers', 'CO₂ emission', and 'fuel usage of freight trucks per EURO turnover' (table 6). Of the latter, only 'number of improvement points from the annual RI&E', 'share of local suppliers and/or providers' and 'fuel usage of freight trucks per EURO turnover' do feature full homogeneity as to innovation success scores (H inno).

Table 6: Homogeneity scores for objective relevance and innovation success

Main objective	Sub-objective	H object	H inno
Economic	<input type="checkbox"/> Return		
	<input type="checkbox"/> Turnover	100%	13%
	<input type="checkbox"/> Liquidity	67%	18%
	<input type="checkbox"/> Solvability	67%	18%
	<input type="checkbox"/> Profitability	46%	24%
	<input type="checkbox"/> EBITDA	46%	24%
	<input type="checkbox"/> Cost of energy, water, waste and transport (% of turnover)	35%	13%
	<input type="checkbox"/> Selling sustainable products/services		
	<input type="checkbox"/> Percentage offers with sustainable options	67%	67%
	<input type="checkbox"/> Share of sustainable products or services in the assortment	46%	7%
	<input type="checkbox"/> Percentage of turnover related to sustainable products or services	67%	40%
	<input type="checkbox"/> Share of complaints about products and services	35%	7%
	<input type="checkbox"/> Sustainable purchasing		
	<input type="checkbox"/> Purchasing costs of raw materials x or material y per euro of turnover	67%	67%
	<input type="checkbox"/> Percentage of purchasing budget in which environmental and social criteria are assumed	100%	67%
	<input type="checkbox"/> Percentage of suppliers and service providers with whom agreements are made about environmental and social affairs	46%	24%
	<input type="checkbox"/> Share of purchased raw materials that is judged on presence of dangerous products	35%	18%
Social	<input type="checkbox"/> Security		
	<input type="checkbox"/> Number of (near-)accidents without personal damage	2%	2%
	<input type="checkbox"/> Number of accidents with personal damage	51%	2%

<input type="checkbox"/> Number of accidents with work leave	18%	2%
<input type="checkbox"/> Number of dangerous goods in the company	2%	18%
<input type="checkbox"/> Number of IMO containers	51%	67%
<input type="checkbox"/> Number of improvement points from the annual RI&E	100%	100%
<input type="checkbox"/> Number of environmental incidents	2%	13%
<input type="checkbox"/> Healthy employees		
<input type="checkbox"/> Percentage of short leave	2%	7%
<input type="checkbox"/> Percentage of medium leave	18%	7%
<input type="checkbox"/> Percentage of long leave	2%	13%
<input type="checkbox"/> Happy employees		
<input type="checkbox"/> Happiness of employees	18%	13%
<input type="checkbox"/> Percentage of staff turnover	2%	40%
<input type="checkbox"/> Employee training		
<input type="checkbox"/> Share of number of hours of training (% of company hours)	51%	13%
<input type="checkbox"/> Share of number of hours of training focused on sustainability (% of company hours)	2%	2%
<input type="checkbox"/> Share of training costs in total company costs	18%	7%
<input type="checkbox"/> Percentage of employees that follows individual training	18%	18%
<input type="checkbox"/> Employee diversity		
<input type="checkbox"/> Percentage of women in service	18%	35%
<input type="checkbox"/> Percentage 15-30 years old	2%	18%
<input type="checkbox"/> Percentage 30-45 years old	2%	13%
<input type="checkbox"/> Percentage 45-67 years old	2%	13%
<input type="checkbox"/> Share of employees with less chances on the employee market (% of staffing)	100%	67%
<input type="checkbox"/> Share of employees with non-European nationality / origin	18%	24%
<input type="checkbox"/> Society		
<input type="checkbox"/> Share of local suppliers and/or providers (within a range of x kilometres)	100%	100%
<input type="checkbox"/> Number of complaints about nuisance	2%	13%
<input type="checkbox"/> Share of employees that contribute to annual volunteer activities of the company	2%	100%
<input type="checkbox"/> Share of supplied capital, facilities and human power for sustainable goals (% of turnover)	18%	35%
<input type="checkbox"/> Share of internship and training places (% of staffing)	51%	18%
Environmental		
<input type="checkbox"/> Energy and climate		
<input type="checkbox"/> Electricity usage	51%	7%
<input type="checkbox"/> Percentage sustainably developed electricity	18%	2%
<input type="checkbox"/> Percentage sustainably developed heat	51%	7%
<input type="checkbox"/> Gas or water usage	2%	7%
<input type="checkbox"/> CO ₂ emission	100%	24%
<input type="checkbox"/> Waste		
<input type="checkbox"/> Waste separation / recycling share	2%	7%
<input type="checkbox"/> Total waste per employee	2%	46%

□ Traffic and transport			
□ Fuel usage business traffic per EURO of turnover	18%	100%	
□ Percentage of company cars with label A or B	51%	100%	
□ Fuel usage of freight trucks per EURO turnover	100%	100%	
□ Percentage of freight trucks with at least EURO 5 engines	51%	100%	
□ Home-work kilometres per employee	18%	67%	
□ Percentage public transport and bike in home-work transport	39%	67%	
□ Share of home work	51%	67%	
□ Promoting expenses for using public transport	18%	67%	

Source: own composition

Overall, when analyzing the descriptive statistics (table 7), we can say that there is relative homogeneity, although very modestly (mean 31.85%), in the objective relevance judgement, and relative heterogeneity in the innovation success scoring (mean 34.69%).

Table 7: Descriptive test statistics

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
H obj	56	.318513	.3208145	.0204	1.0000
H inno	56	.346939	.3257050	.0204	1.0000

Futhermore, a Wilcoxon ranked sum test was performed to compare consistency between objective relevance scoring and innovation success scoring. It turns out from the resulting z value that the hypothesis that both scorings match well, cannot be rejected at the 0.05 confidence level (table 8). There is therefore no indication that better achieved goals through innovations are not the ones that overall are found most important.

Table 8: Wilcoxon test statistics

Ranks				
		N	Mean Rank	Sum of Ranks
H inno - H obj	Negative Ranks	18 ^a	32.03	576.50
	Positive Ranks	34 ^b	23.57	801.50
	Ties	4 ^c		
	Total	56		

a. H inno < H obj

b. H inno > H obj

c. H inno = H obj

Test Statistics^a

	H inno - H obj
Z	-1.027 ^b
Asymp. Sig. (2-tailed)	.304

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

5. CONCLUSION

This paper analysed CSR practice in seaports. It was observed from existing literature that CSR had not really been dealt with in a more or less comprehensive way. The only research to date had analysed in depth partial aspects. In this paper, an effort was made to remedy this. Focus was on port-related companies in the ports of Antwerp and Rotterdam. A Delphi approach was taken, starting from a list of CSR objectives as applied by Stimular Stichting, but in line with approaches by among others United Nations, OECD and the European Commission. The resulting objective scheme consists of three broad components: economic, social and environmental.

The CSR objective importance scoring given by the interviewed companies shows that overall, social objectives are deemed most important in the companies' CSR policy, followed by economic objectives, and with environmental objectives being least important. The most relevant objectives turn out to be turnover and CO₂ emissions. Judged irrelevant with respect to their CSR policies are the 'percentage of purchasing budget in which environmental and social criteria are assumed', 'number of improvement points from the annual RI&E', 'share of employees with less chances on the employee market', 'share of local suppliers and/or providers', and 'fuel usage of freight trucks per EURO turnover'.

Subsequently, one innovation that was deemed key to each of the seven interviewed companies was tested on its impact success. In line with the relative importance of the three types of objectives, it seems that the social objectives are best achieved, followed by economic and environmental objectives. Best achievable seem the 'number of dangerous goods', 'share of number of hours of training' and 'percentage of employees that follows individual training'. Of the latter, only the 'share of number of hours of training' was deemed very relevant by the companies. Of the objectives judged overall

very important, only 'CO₂ emissions' seems to be very well achieved through innovation initiatives.

Furthermore, homogeneity of the two types of answers was assessed, and compared among each other. It turns out that there is relative homogeneity, although very modestly, in the objective relevance judgement, and relative heterogeneity in the innovation success scoring. Only 'number of improvement points from the annual R&E', 'share of local suppliers and/or providers' and 'fuel usage of freight trucks per EURO turnover' do feature full homogeneity for both objective relevance and innovation success. The Wilcoxon rank sum test confirms that there is no deviation overall of both types of homogeneities.

These results give a good first indication of the extent to which CSR is being applied and related innovations are actually successful. The match between the two is rather limited. In order to test whether this remains valid in other contexts, extensions might be required in terms of the number of innovation initiatives, the company scope, the geographical scope and the time scope. Furthermore, it would be interesting to analyse in depth why a certain innovation does not reach the intended objective. These are all possible suggestions for further research.

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