

Sustainability Reporting in the Port Sector

Is GRI the Way Forward?

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Abstract

Over the past ten years, there has been a substantial increase in corporate sustainability performance coupled with a need to voluntarily and publicly report on these issues. The current prominent and legitimate guidelines framing companies' sustainability reporting practices are those proposed by the Global Reporting Initiative (GRI). In addition to providing a framework applicable for all types of companies, the GRI has developed Sector Supplements, allowing sectors to report according to their specific needs. However, such guidance has not yet been developed for the port sector. As a result, the objective of this research is to investigate the current state of sustainability reporting in the port sector by focusing on environmental indicators. Using a questionnaire-based method, this study seeks to understand the rationale behind each of these environmental disclosures in order to identify material topic indicators representative of the port sector. Through a Stakeholder theory framework, a list of GRI G3.1 environmental indicators is proposed to be either included or suppressed for the development of a Sector Supplement, or likewise. Potential additional indicators material to the port sector that are not covered under G3.1 is also identified. Complemented with a meeting and interviews with GRI staff, this information has enabled the study to also provide broader recommendations – not limited to the environmental pillar – for the creation of a Sector Supplement, or the equivalent, for the port sector. Overall, this thesis provides an overview of both the current situation concerning sustainability reporting and the potential future stages, which are already seen in more advanced reporting systems in the reporting systems of certain ports.

Keywords: Sustainability reporting, environmental indicators, Global Reporting Initiative (GRI), port sector, Stakeholder theory, Corporate Social Responsibility (CSR).

Executive Summary

Port policy has long been mainly driven by economic development, with a principal focus on the organisation of the flow of goods, while ensuring employment for the region. Over the past decades however, awareness regarding port environmental and social issues has increased. It has become clear that many ports are located in sensitive environments and are faced with the challenge of reducing impacts on local residents and on the environment (de Deckere, 2012). The environmental issues that ports are confronted with are numerous, and include aspects such as water, noise, air emissions, soil and sediment (GHD, 2013). Within this context, many ports have started to include sustainability in their business by integrating social and environment aspects within their economic development.

Coupled with a substantial increase in port corporate sustainability performance, a desire to voluntarily and publicly report on these issues has also emerged. The practice of reporting on sustainability performance is usually referred to as **sustainability reporting**, implying the development of “*public reports by companies to provide internal and external stakeholders with a picture of the corporate position and activities on economic, environmental and social dimensions*” (WBCSD, 2002, p.6). The current prominent and legitimate guidelines framing ports’ sustainability reporting practices are those proposed by the Global Reporting Initiative (GRI). GRI is a commonly used reporting tool, providing guidance and support to a wide range of thousands of organisations worldwide (GRI, n.d.). In the KPMG Survey of Corporate Responsibility Reporting 2013, KPMG revealed that the use of the GRI Guidelines is almost universal, with 78% of the reporting organisations referring to the GRI Guidelines in their reports (KPMG, 2013b).

Arising from the desire to offer a tool applicable for all types of companies, the GRI Guidelines are quite generic. To complement these guidelines, GRI has developed specific sector guidance for some sectors, e.g. a Sector Supplement for airports. However, the GRI has not developed Sector Supplements for all sectors, and some are consequently left with no sector guidance to respond to specific needs of their industry. The port sector is one of these. As a result, a preliminary review of the literature emphasises that:

- The port sector encompasses different reporting styles, which results in a wide variety of nearly incomparable sustainable reports, therefore hardly enabling benchmarking;
- There are a number of port specific aspects that are not included in the general GRI guidelines;
- There is the potential to increase the number and the quality of sustainability reports and
- There is the potential to standardise port sustainability reports (PIANC, 2013a).

Consequently, the objective of this research is to investigate the current state of sustainability reporting in the port sector by focusing on environmental indicators, while also analysing potential room for the creation of a Sector Supplement, or the equivalent. To achieve these goals, two main research questions (RQs) have been drafted in order to guide this thesis. They are presented below, together with the main findings.

RQ1: “What does ports’ environmental reporting look like within - or outside - the GRI Guidelines and what is the rationale behind ports’ environmental disclosure?”

A content analysis of ports’ sustainability reports reveals that the port sector encompasses different reporting styles. Some ports are reporting in accordance with the GRI Guidelines - either under G3 or G4 -, others are not reporting in accordance with GRI, and some ports are not reporting at all. In addition, although the term Sustainability Report (SR) has been used

throughout the whole thesis, the actual names referring to these reports are different. Mostly they can be found as a separate report, but disclosures of sustainability performance have also been found integrated within annual reports. Furthermore, ports do not set their reporting boundaries similarly: some report on the port authority, others on the port area and still others on both. Although these reports can provide each port individually with a tool enabling internal organisational change, different reporting boundaries do not allow for benchmarking. Finally, differences can be found in the indicators disclosed by ports. However, the common trend is to report on areas related to energy, emissions and compliance. Within the ports reporting in accordance with GRI, the identified most and least frequently reported environmental indicators are presented in Table 1.

Table 1 Most and least frequently reported GRI environmental indicators in the port sector identified with a binary scoring method

MOST FREQUENTLY REPORTED INDICATORS	LEAST FREQUENTLY REPORTED INDICATORS
EN3 - Direct energy consumption by primary energy source	EN2 - Percentage of materials used that are recycled input materials
EN16 - Total direct and indirect greenhouse gas emissions by weight	EN19 - Emissions of ozone-depleting substances by weight
EN22 - Total weight of waste by type and disposal method	EN27 - Percentage of products sold and their packaging materials that are reclaimed by category

While some indicators are fully present or completely excluded, other environmental indicators provide a less straightforward picture. Many indicators are situated in between these two extremes, as they are sometimes reported by ports but with no obvious consistency. Moreover, an indicator’s high (or low) reporting rate does not necessarily reflect its (non) materiality. Materiality refers to the fact that information found in reports should cover indicators that reflect the organisation’s significant economic, environmental and social impacts or that would influence the evaluation and decisions of stakeholders (GRI, 2013a). Knowing which indicators from the GRI Guidelines should be included in the Sector Supplement, or the equivalent, and which should be left out, therefore requires understanding the factors driving environmental disclosure in the port sector. Through a questionnaire-based method, this study identified the 3 most often cited responses for reporting on an environmental indicator by ports that are reporting in accordance with the GRI framework.

- (1) To meet the requirements of GRI,
- (2) To respond to stakeholder concerns
- (3) To provide managers with an overview and understanding of the performance over time.

The first reason has rarely been mentioned on its own, as it is usually cited in combination with other reasons, which legitimises the use of this reason. Overall, the findings obtained suggest that the practice of environmental reporting - at least in the port sector - has moved away from an old-fashioned way of thinking about environmental reporting. Although other theories, such as the legitimacy theory, will always be explanatory components of sustainability reporting, this study supports the Stakeholder theory. More specifically, sustainability reporting has been identified as a tool to respond to port authority’s specific stakeholders.

RQ2: How can ports both improve and harmonise their sustainability reporting?

The creation of a Sector Supplement, or the equivalent, for the port sector stands out as the best way to both improve and harmonise sustainability reporting in the sector. This research therefore encourages the development of such guidelines and provides potentially valuable information for developing them. This information is gathered in Table 2.

Table 2 Potentially valuable information for developing a port Sector Supplement, or the equivalent.

POTENTIALLY VALUABLE INFORMATION	CF.
Existing initiatives in the port sector	Section 2.2.2 Sustainability reporting for ports
Advice from GRI to the port sector	Section 4.2, Lessons learned from GRI
A first round of information on the GRI environmental indicators and their analyses	Section 5.2 GRI's aspects in light of theory
List of potential additional indicators	Section 7.2, Targeted state –“Where do we want to be”

Based on the GRI G3.1 Guidelines, this study more specifically proposes a set of four categories of environmental indicators: G3.1 Environmental indicators that can be set aside (1), kept intact (2) or refined to port operations (3), as well as non-G3.1 environmental indicators identified as material (4) for the development of a port Sector Supplement, or the equivalent. Regarding the three first categories, a GRI indicator is considered to have potential for a port Sector Supplement, or the equivalent, if identified - from the questionnaires - as having been reported for material reasons. Since materiality clearly encompasses stakeholders, the Stakeholder theory was used as a framework for the selection of material indicators. With respect to the fourth category, an overview of these indicators is provided in Table 3.

Table 3 Category 4: Non- G3.1 environmental indicators identified as material for the port sector in the context of developing a Sector Supplement, or the equivalent.

	Aspects	Potential additional indicators
G3.1's Aspects	WATER	Water quality
	BIODIVERSITY	Compensation area
	EMISSIONS	GHG emission intensity (G4-EN18) Air quality (to be linked with EN20) Initiatives to (1) provide vessels with low sulphur marine fuel or alternative and (2) incentivise low sulphur emitters (e.g. discounted harbour due rate and associated awards) - (to be linked with EN16)
	EFFLUENTS	Initiatives related to spills preparedness and response
	WASTE	Discounted harbour due rate for waste
	OVERALL	Level of implementation of the EMS
	GRIEVANCE	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms (G4-EN34). To be adapted to the port sector, i.e. to cover noise, odour, air quality.
	SOIL AND GROUNDWATER	Soil quality Sediment quality

Regardless of the category of indicators, this study determined that a decision has to be made on the reporting boundaries, i.e. whether to report on the port authority or to extend the effort to the whole port area. The latter is here advised for two main reasons: (1) ports disclose information mainly to respond to stakeholders' concerns and stakeholders want to obtain information on the impacts of the port area and (2) GRI advises extending the reporting boundaries to operations that port authorities do not necessarily have operational control over, i.e. companies operating at the port area.

Based on findings of this study, suggestions for future research are proposed. Firstly, the quantification of each environmental indicator that has been identified as material to the port sector under this study could be of interest. Secondly, a similar investigation could be undertaken for the economic and social indicators proposed by GRI. Such an investigation could act complementarily to these findings, and therefore help the port sector further harmonise its reporting practices.

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Abbreviations

CERES - Coalition for Environmentally responsible Economies
CSR – Corporate Social Responsibility
EMS – Environmental Management System
ESI – Environmental Ship Index
ESPO – European Sea Ports Organisation
EU – European Union
GRI – Global Reporting Initiative
IAPH - International Association of Ports and Harbours
IAS – International Accountability Standard
IIRC - International Integrated Reporting Council
IMO – International Maritime Organization
IR – Integrated Reporting
KEPI – Key Environmental Performance Indicator
LNG – Liquefied Natural Gas
MARPOL - International Convention for the Prevention of Pollution from Ships
OECD - Organisation for Economic Co-operation and Development
PERS - Port Environmental Review System
PIANC – World association for Waterborne Transport Infrastructure
PPRISM – Port PeRformance Indicators: Section and Measurement
SDM - Self-Diagnosis Method
SR – Sustainability Report
TBL – Triple Bottom Line
UNEP – United Nations Environmental Programme

1 Introduction

1.1 Background and significance

To many people, it is clear that our economy needs to switch to a more sustainable model. Companies can help contribute to this transformation and frontrunners have started taking initiatives by embedding sustainability within their businesses. Doing so is, however, a challenge and requires corporate organisational change. In order to drive change, companies need to set goals, measure and manage their progression towards them (GRI, 2013a). One way of doing this is to use sustainability reporting. Sustainability reporting is the practice of reporting – usually through a sustainability report (SR) - on environmental, social and economic performances (Daizy, Sen, & Das, 2013a; GRI, 2006). In addition to setting goals and measuring targets, reporting on an organisation’s sustainability performance gives both internal and external stakeholders a clear idea of their impacts, and has the potential to increase efficiency as well as performance (GRI, 2013a). Even though the rate, quality and type of content reported differ according to both the country and the sector where a company operates, a growing trend in sustainability reporting has been observed overall (KPMG, 2013b). This trend might increase within the European Union (EU) since an EU Directive made environmental and social performance disclosure mandatory for larger companies (European Commission, 2014).

Ports are diverse in their locations, surrounding environments and legislation, and they are also of different types: inland, fishing, dry and warm-water ports and sea ports, inter alia including cargo ports (GHD, 2013). Due to these differences, it is unclear how many ports actually exist. However, World Port Source (2014) provides information for 4 764 ports in 196 countries around the world. These numerous ports greatly contribute to the overall amount of freight shipped every year. For example, the total gross weight of goods handled in EU ports was estimated at 3.7 billion tonnes in 2012 (Eurostat, 2014). However, while ports constitute the backbone of many national and even regional economies, they also include significant social and environmental aspects. Many are located in sensitive environments and face the challenge of reducing impacts on local residents and on the environment. According to studies on the ports sector, the most prominent environmental issues that ports focus on are water quality, noise, and air emissions (GHD, 2013). The significance of sustainability reporting in the port sector has therefore also increased and it is helping to provide a picture on how companies and organizations in a port can gather people, planet and profit. Most ports are already communicating their sustainability performance and several of them are doing so in accordance with the Global Reporting Initiative (GRI) Guidelines. GRI is a not-for-profit-organisation providing companies with comprehensive guidance on how to report on sustainability performance. It is regarded as a widely used reporting tool, providing guidance and support to a wide range of organisations. It is developed by thousands of organizations and experts worldwide, through a multi-stakeholders process (GRI, 2013a).

1.2 Problem definition

Arising from the desire to offer a tool applicable for all type of companies, the GRI Guidelines are quite generic. As a way to overcome this limitation, GRI has developed specific sector guidance to complement these generic guidelines, e.g. a Sector Supplement for airport operators. However, the GRI does not have supplements for all sectors, and some are left with no sector guidance to respond to specific needs of their industry. The port sector is one of them. As a result, ports around the world take different approaches in their sustainability reporting process, leading to a wide variety of nearly incomparable sustainable reports. Some ports focus on the whole port’s activities while others concentrate on the port authority’s activities only. Some reports are drawn up by port authorities and others are done by port communities. Also, some ports publish a separate sustainability report, while others integrate sus-

tainability issues in their annual report (PIANC, 2013a). Developing port specific guidance within the Guidelines of GRI has therefore been identified by the sector as necessary to improve port sustainability reports and standardise port sustainability reporting. Based on the experiences of the ports that have published a sustainability report so far, it has been identified (PIANC, 2013a) that:

- There are a number of port specific aspects that are not included in the general GRI guidelines;
- There is a potential to increase the number and the quality of sustainability reports;
- There is a potential to standardise port sustainability reports (PIANC, 2013a).

As a way to fulfil these needs, the World Association for Waterborne Transport and Infrastructure (PIANC) and the International Association of Ports and Harbours (IAPH) have set up a working group (WG174) that aims to develop port-specific guidance through a stakeholder approach¹. The Port of Antwerp, a collaborator of this thesis, has been asked to lead the WG174 due to its satisfactory performance regarding sustainability reporting². The aim of this thesis is to contribute to the work of the WG174 by analysing the environmental part³ of the sustainability reports.

1.3 Research questions

Given the problem definition being presented above, this thesis research questions (RQs) are defined as follows:

- *RQ1: What does ports' environmental reporting look like within - or outside - the GRI Guidelines and what is the rationale behind ports' environmental disclosure?*

The first research question (RQ1) represents the initial step of this research and is intended to focus on one part of sustainability reporting only, i.e. environmental reporting. The social and economic dimensions of sustainability reporting are therefore not included in the scope of this thesis (cf. Section 1.5). While the first part of the question enables the reader to get a broad overview of the current situation of environmental reporting in the port sector, the second one goes further and analyse the reasons behind each environmental disclosure.

- *RQ2: How can ports both improve and harmonise their sustainability reporting?*

By addressing the second research question (RQ2), this research aims to contribute to a more encompassing purpose, i.e. improving port sustainability reporting as a whole. More specifically, the present research seeks to provide a pre-study for the WG174. Even though the present research mainly focuses on key environmental performance indicators (cf. RQ1), RQ2 does provide broad recommendations linked to sustainability reporting in general.

¹ The working group hopes to gather various stakeholders including, the International Association for Harbour and Port (IAPH), the Global Reporting Initiative (GRI), port authorities, the European Sea Ports Organization (ESPO), consultants active in sustainability reporting, NGO's representing environmental and social aspects related to ports, and representative(s) of shipping and port logistics sector (PIANC, 2013a)

² For example, the Port of Antwerp won the Award of Best Belgian Sustainable Report in 2012 (de Deckere, 2012)

³ The economic and social part of sustainability reports are not analysed in the present study.

1.4 Methodology

Triangulation is used as a way to enhance confidence in the ensuing findings, therefore allowing for a more comprehensive picture of the phenomenon studied. The methodology, which is both of qualitative and quantitative nature, is based on the following methods:

- An extensive literature review of the topic lays the ground for **qualitative** methods such as formal and informal interviews, questionnaires and personal experiences.
- As part of a content analysis a **quantitative** scoring methodology was established and is further analysed through the Stakeholder theory framework.
- On top of that, the structure of the gap analysis presents the findings in the conclusion.

1.4.1 Research design

As figure 1 suggests, four methodological steps were initially developed based on the research problem. These steps have been further transposed into an analytical tool, called *gap analysis*, as a way to ease both the flow and the research structure. The first two methodological steps, deepening knowledge of sustainability reporting and mapping out Key Environmental Performance Indicators (KEPIs) for ports, correspond to the first stage of the gap analysis, “*where are we now*”, and will ultimately lead to the answer of the first research question (RQ1) “*What does ports’ environmental reporting look like within - or outside - the GRI Guidelines and what is the rationale behind ports’ environmental disclosure?*” The third methodological step, assessing the findings gathered through the data collection, allows for the gap identification between the identified current stage – “*where are we now*”- and the expected stage – “*where do we want to be*”. The Stakeholder theory is deployed as an analytical framework enabling the processing of the data collected and leading us to the later stage – “*where do we want to be*” - as well as to the second research question (RQ2): *How can ports both improve and harmonise their sustainability reporting?*

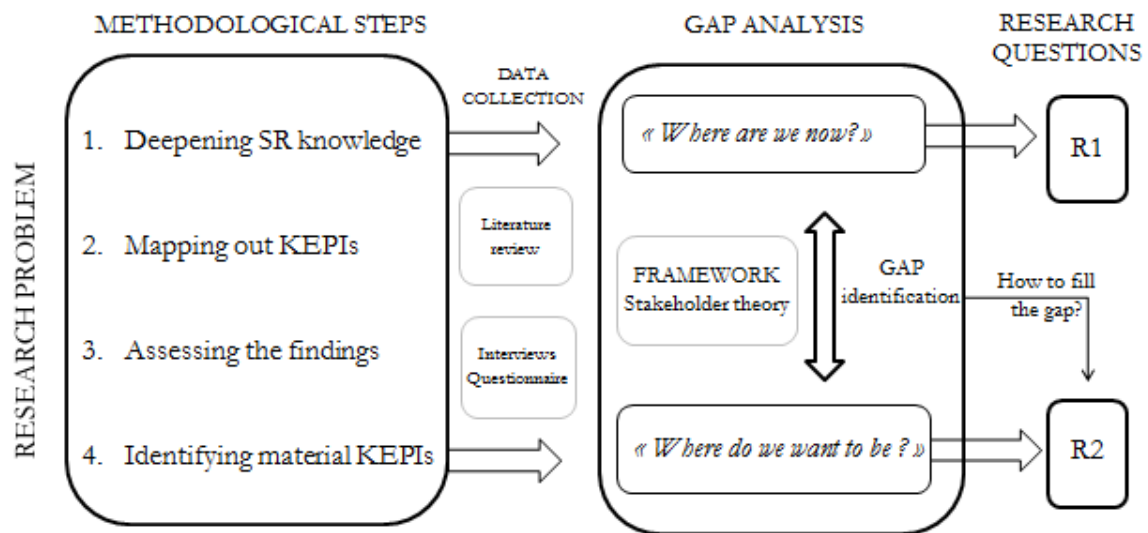


Figure 1 Research design overview

1.4.2 Academic framework and analysis tool

Improvement and harmonisation can be achieved through the creation of a sector supplement – or likewise (cf. Section 1.2). Sector-specific guidance requires, inter alia, the identification of indicator matching the port sector’s activities. Since this thesis focuses on the environmental side of sustainability reporting, the identification of KEPIs are covered here. Highlighting KEPIs in the port sector can be done by understanding the rationale behind ports’ disclosure (RQ1) and from there, pinpointing which indicators are reported due to their materiality to the

port sector. In this sense, RQ1 provides a basis for the answer of RQ2. Materiality has been increasingly relevant in the context of sustainability reporting and refers to the fact that indicators disclosed should reflect the organisations' significant impact and those that influence the evaluation and decision of stakeholders (GRI, 2013a). In this context, the Stakeholder theory is used to derive the indicator's materiality. Stakeholder theory helps to deepen the understanding of port's choices and help conduct an analysis of what indicators are materials from a stakeholder perspective. Theoretically, the Stakeholder theory argues the act of reporting on sustainability performance is due to the necessity for companies to respond to their stakeholder's needs and to maintain and/or gain their support (Dobbs, Deloitte, & van Staden, 2012). The Stakeholder theory has been identified as a significant framework to this thesis in the literature review (cf. Chapter 3). The new G4 Guidelines emphasises the role of stakeholders as essential in the reporting process. The Stakeholder theory and its choice in this thesis are further detailed in the literature review.

When trying to identify the rationale behind environmental disclosure, the different reporting styles amongst ports stand out fairly quickly. In this context, hypotheses that potentially explain the different reporting styles and the rationales behind each indicator reported were elaborated. They were drawn based on the literature review and the researcher identifies four main reasons why ports do - or do not - report on certain indicators specifically. These reasons serve as hypotheses driving the present thesis and are the following:

- (1) **Data availability:** ports do – or do not - report on an indicator due to the ease - or difficulty – of access to the data regarding this indicator.
- (2) **Public Relations Impression:** ports do – or do not – report on an indicator because they would like – or would not like - to inform about this issue. The indicator could therefore refer to an activity they are extremely good – or bad - at in order to manage their image.
- (3) **Genuine differences:** Ports do – or do not – report on an indicator because their own context justifies it. Genuine differences can refer to specific stakeholder demand, a particular geographic situation or even national or regional legislation.
- (4) **Different stages of evolution:** ports do – or do not – report on an indicator because they are at different stages in their development. Many ports have been reporting on sustainability performance for many years while some have just started. Some (usually bigger) ports do have the resources (both financial and human) to report while others are limited.

The two first hypotheses, data availability and public relations impression, are closely related to companies' internal choices. With the first hypothesis, there is a risk that companies do not report on material indicators, because it requires too much effort, or conversely, they do report on non-material indicators since the information is easily available. With the second hypothesis, there is a risk that sustainability reporting is utilized as a “brochure” to sell their company. These two first reasons are not considered by the researcher as legitimate reasons since sustainability reporting originally aims to communicate on a true and faire view of the corporate position and activities. The third hypothesis however, is regarded as more legitimate since it reflects companies' own contextual reasons for reporting on environmental matters, therefore stressing the indicator materiality to the organisation. The fourth reason, different stages of evolution, is obviously connected to the first one, data availability, but still has to be considered separately in the present categorization. Including the fourth reason allows for a broader heading for honest companies that are not completely successful in their sustainability reporting effort.

Basically, the main idea behind the elaboration of these hypotheses was that if one indicator was identified – through a questionnaire – as having been reported for a “legitimate” reason, i.e. the third hypothesis, then it could be kept in mind for the development of sector guidance

for ports. If on the other hand the indicator was reported for an illegitimate reason, it could be left out. However, one hypothesis does not necessarily exclude another and there is usually more than one reasons explaining why companies report on their sustainability performances (Deegan & Rankin, 1997; Jupe, 2005; van der Laan, 2009). It has been considered throughout the present study.

On the business side, the gap analysis is used as a tool to present the main findings to the port sector. A brief overview of the use of the gap analysis is here presented in three steps:

- (1) **Defining the current situation of port sector SR:** the current situation of port sustainability reporting is assessed based on a main comparative table. It encompasses GRI environmental indicators by highlighting those selected by ports and those excluded. This table is not intended to set up a compliance ranking of different port reports. Rather, the table will give an overview of the current situation and therefore contribute to answering RQ1. In addition to this table, the literature review and the interviews will help evaluating sustainability reporting amongst ports that are not using the GRI Guidelines.
- (2) **Defining a targeted future stage:** a set of suitable indicators for the port sector are developed. This is done through by processing the previously-mentioned table and by examining the literature review, the interviews and the sectorial guidelines analysis.
- (3) **Bridging the gap:** recommendations are provided on how to fill in the gap between the current state of sustainability reporting and the companies should aim towards.

1.4.3 Data collection

The data collected are of primary and secondary type, both being of equal importance for the present research. **Primary data** are key contributors to answering the research questions and were collected through a sector meeting attendance, semi-structured interviews and (3) questionnaires.

- (1) A **meeting** at GRI's office in Amsterdam was attended on the 25th of June 2014 together with the ports of Antwerp, Rotterdam and Ferrol. The purpose of this meeting was to discuss the future of sustainability reporting and sector guidance for the port sector.
- (2) After the meeting, two follow-up **semi-structured interviews** were conducted with GRI staff involved in existing sector guidance. The main aim of these interviews was to learn from GRI's experience in creating sector guidance.
- (3) Adjustable **questionnaires** were designed for the three main targeted groups of respondents. Following the reasoning of the hypotheses and the framework of this thesis, all the questionnaires aimed to understand the rationale behind the choice of sustainability disclosure. The questionnaires were customizable and therefore adapted to each port based on their last SR – or the equivalent- published or available online.

A first kind of questionnaire was designed for environmental managers - or the equivalent⁴ - of ports that are reporting in accordance with the GRI Guidelines. In this context, questionnaires helped explain why each port is reporting on certain GRI environmental indicators rather than on others. In addition, the questionnaire also sought input on how to improve the use of the GRI Guidelines in the port sector, e.g. missing or irrelevant indicators for the sec-

⁴ Environmental managers or any people involved in the development of sustainability reports who would be best qualified to answer the questionnaire. Exploring other routes such as the stakeholder's perception of sustainability reporting would have been interesting. However, it would not have suited (1) the aim of the questionnaire, i.e. understanding the rationale behind each indicator disclosed, and (2) the scope of the thesis, i.e. 15 ports.

tor. A second kind of questionnaire was developed for environmental managers – or the equivalent- of ports that are reporting on sustainability performance but not with the GRI Guidelines. The rationale behind both the choice of indicators disclosed and the non-use of the GRI Guidelines were investigated. Finally, a third type of questionnaire was addressed to environmental managers - or the equivalent - of ports that are not reporting on sustainability performance. The main goal here was to understand why these ports chose not to report.

Concretely, the questionnaire developed for the two first kinds of respondents, i.e. those reporting on sustainability performance – either with or without the GRI Guidelines-, contains two main sections. One section is on indicators reported and another on indicators not reported. Since ports disclosed different information, i.e. indicators, each questionnaire was adapted to each individual port, requiring the identification of the specific indicators reported by each port⁵. The questionnaire addressed to the third type of respondent only contains one section; determining the reason for not reporting on sustainability performance. Overall, although questionnaires were slightly different depending on the port to which they were addressed, the possible answers were all the same. With regards to the course of the data collection, environmental managers filled in the questionnaire form and sent it through by email. Some of them were also willing to further discuss the subject during a call interview which enabled a better understanding of their reporting system.

With respect to **secondary data**, an extensive literature review of the research field was undertaken. The review includes topics on both sustainability reporting and port operations and their environmental effects. GRI reports as well as port sustainability reports were used as main work basis. In addition, academic journals, trade publications, magazines, conference material were analysed. These secondary data were mainly found online, but some were also provided by the Port of Antwerp. When found online, they were scanned through LU Online Library and Google scholar platform as well as through the common public Internet.

1.5 Scope and limitations

This thesis includes 12 ports which can be distributed within three categories (cf. Table 4)⁶

Table 4 Ports under analysis in this research, divided into three categories

	Name	Country
(1) Reporting in accordance with GRI	Port of Antwerp	Belgium
	Port of Ferrol	Spain
	Port of Los Angeles	United-States
	Port of Rotterdam	Netherlands
	Port of Sines	Portugal
	Port of Vancouver	Canada
(2) Not reporting in accordance with GRI	Groningen Seaports	Netherlands
	Valencia Port	Spain
	Port of Ghent	Belgium
	Port of Gothenburg	Sweden
(3) Not reporting at all	Nigerian Ports	Nigeria
	Port of Strasbourg	France

⁵ An example of a questionnaire designed for the Port of Los Angeles can be found in Annex 1.

⁶ More information regarding ports' reporting entities and their ownership structures can be found in Annex 2.

In the first category, ports that are reporting in accordance with the GRI Guidelines, 13 ports were identified⁷. These 13 ports were all processed with the scoring system elaborated above. However, the questionnaire was only addressed to 8 out of the 13 using the GRI Guidelines. The reasons for not including all of the 13 reports are two-fold. Firstly, although all the 13 ports were contacted, not all of them responded or were willing to cooperate. Secondly, the number of ports had to be limited due to time constraints. A choice was made to also include ports of the two other categories instead of focusing on ports in the first category only. Since the encompassing purpose of this thesis is to identify ports' KEPI, the input of any category of port was welcome. Indeed, obviously not only ports reporting in accordance with GRI have experience on port environmental issues and performance to share. Moreover, focusing only on the first category could have restrained the research, as ports in the first category are already conditioned and/or influenced by the Guidelines proposed by GRI. Outsiders' points of views are therefore seen as an asset as they have the potential to bring new perspective on environmental performance indicators to this research. Moreover, including these two categories is also a way to identify missing or unnecessary indicators from the GRI Guidelines. Along the same lines of reasoning, when selecting ports under analysis, not only ports with a PIANC – IAPH membership were selected. As part of the same network, they might have been influenced by it and therefore have similar viewpoints on port environmental performance. The research therefore included non-PIANC-IAPH members. Most of the contacts were facilitated by a list of contacts provided by the port of Antwerp. Finally, the selection of ports was not restricted by port type or size. Since the ultimate goal driving this research is the creation of reporting guidelines for ports, the insights of all ports has been considered as valuable.

Just as the selection of ports was limited, the scope of this research has also been narrowed down to the environmental indicators of sustainability reporting. This focus on environmental reporting has been previously realised by other studies (e.g. Alazzani & Wan-Hussin, 2013) since environmental performance's effect on companies' financial health is of growing concern to many stakeholders (Alazzani & Wan-Hussin, 2013). The two other pillars of sustainability reporting, i.e. the economic and social pillars will not be covered under this thesis due to time constraint. However, since these three pillars overlap and indicators might be classified in various sections depending on the port SR one looks at, the social and economic sections of SRs were also processed.

Furthermore, potential limitations related to the research must be considered. Firstly, since not all SRs are necessarily published in English, SR in Spanish, Portuguese and Dutch also had to be analysed. The researcher tried to overcome the language limitation by asking for clarification from port environmental managers when it was necessary. Secondly, other concerns originating from the qualitative method in itself are: the various perspectives of the participants, the reflexivity of the researcher, etc. (Flick, 2014). Thirdly, since the study focuses on the identification of the presence or absence of indicators, their quality were here not analysed. Fourthly, the identification of the last SR from each port was not always an easy task. Since some websites were not always up to date, the researcher ended up analysing an older report. However, this problem was rectified as often as possible thanks to interviews and email communication with ports.

⁷ The 13 ports identified as users of the GRI framework are the following: Port of Antwerp, Bremen ports, Port of Ferrol, Port of Los Angeles, Port of Rotterdam, Port of Sines, Transnet National Port Authority, Port of Metro Vancouver, Port of A Coruña, Port of Santa Marta, Port of Stockholm, Port of Dubai, Port of Tianjin. A list with further details on these 13 ports is provided in Annex 3. In addition, three ports which were reporting in accordance with GRI's framework but are not any more were also found: the port of Auckland (2010) Brisbane (2008/2009, 2009/2010) and Lisbon (2007, 2008). One should note that the list provided in Annex 3 might miss other ports reporting in accordance with GRI. There is nowadays no existing list and the GRI database is not exhaustive (J. Gaussem, personal communication, June 30, 2014).

1.6 Audience

As previously highlighted, this thesis aims to contribute to the improvement of reporting guidelines in the port sector. Consequently, the directly targeted audience is the PIANC and IAPH working group, whose aim is to equip ports with the sector-specific guidance that is lacking in the GRI Guidelines. The outcome of this thesis will hopefully provide a pre-study for the kick-off workshop of the PIANC and IAPH working group, but might also be of use to any ports interested in improving their sustainability reporting process. More generally, any persons who wish to be abreast of the last trends regarding GRI and/or of ports sustainability performance might also find the results useful.

1.7 Disposition of the research

In order to address both the problem and its derived research questions previously defined, the present thesis has been structured in the following way:

Chapter 1 provides the reader with an introduction and a brief overview of the research undertaken. The nature of the problem addressed, the related research questions, the methodology and framework used the limitations and scope as well as of the audience to which the research may be useful is proposed.

In **Chapter 2**, further background information is provided in order to set the stage for and optimize understanding of the following chapters. Two main themes of this thesis, i.e. sustainability reporting and the port sector, are separately introduced.

Chapter 3 proposes a more thorough analysis of the sustainability reporting field with a review of the literature. This chapter demonstrates gaps in the literature and contributes to the development of the thesis methodology.

Chapter 4 presents the main findings of this study. The outcome from both the content analysis of port reports and the interviews with environmental managers are presented. Furthermore, insights from GRI representatives are explained.

Chapter 5 analyses in depth the findings presented in chapter 4 through the lens of the academic framework. In addition, some recommendations for the port sector are provided in the form of a gap analysis.

Chapter 6 provides a discussion on both the methodological choice made throughout the research and the findings obtained. This reflection clarifies the limitations and contributions of this thesis.

Chapter 7 concludes by summarizing the main findings and lessons learned through the course of this research. The main contributions to the field as well as some recommendations for future research are highlighted.

2 Background information

This chapter proposes background information and further details on the two main parts of this thesis: sustainability reporting with a focus on GRI and the port sector. This two-part overview aims to lay the foundation for and facilitate understanding of the following chapters. Later on, no distinction is made between these two parts since the topic of this thesis, sustainability reporting in the port sector; make them complementary rather than distinct.

2.1 Sustainability reporting

Sustainable development has been defined as a “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*” (Brundtland, 1987). Even though sustainable development is a societal concept (Roca & Searcy, 2012), it has increasingly been used as a corporate concept (Steurer, Langer, Konrad, & Martinuzzi, 2005). Corporate sustainable development is defined by van Marrewijk, (2003); as the process of “demonstrating the inclusion of social and environmental in business operations and in interactions with stakeholders”. This concept is closely related – or for certain even the same as (e.g. van Marrewijk, 2003) – to Corporate Social Responsibility (CSR). Although the exact similarities and differences between the two concepts have not been clearly mapped out, they both aim to address corporate (1) economic, (2) environmental and (3) social issues. These three elements are equally referred to as the Triple Bottom Line (TBL) (Elkington, 1997), the three pillars of sustainability or the three Ps: People, Planet and Prosperity.

In this context, International Accountability Standards (IAS) are on the rise and seek to help companies support organisational accountability (Rasche, 2009). Being accountable is being subject to a governance structure that can examine performance against a set of predefined standards. Therefore, unlike codes of conduct, which are firm-specific and designed by the companies themselves, IAS are defined by third parties (Rasche, 2009) usually through a stakeholder process (Gilbert, Rasche, & Waddock, 2011; Rasche, 2009). They are characterised as soft law (Gilbert et al., 2011) since these standards do not impel organisations via legally binding legislation. Interestingly, Gilbert et al. (2011) add that IAS mainly occur because of a lack of transnational regulation regarding corporate sustainability issues. Therefore, IAS can be seen as a way to address those areas where binding transnational legal regulations do not exist yet. Although all IAS aim to hold organisations responsible for their acts or omissions (Gilbert et al., 2011), a classification differentiating these standards is available in the published literature. No consensus on a classification of these standards exists so far but Rasche (2009) identified three widely used categories of IAS:

- (1) Principle-based standards, such as the UN Global Compact, are broadly defined principles on social and environmental issues usually utilised as experience, best practice and a basis for dialogue;
- (2) Certification standards, such as SA8000 and ISO 14 001, can be distinguished from the first category of standards since they involve certification, verification and monitoring of production facilities against a given set of criteria;
- (3) Reporting standards, such as GRI, offer generic and standardised frameworks for economic, social and environmental reporting.

This thesis focuses on the third category of standard identified above, reporting standards. This type of standard has also been identified in the literature as “non-financial reporting” or “sustainability reporting”.⁸ In recent years an increasing number of organisations around the

⁸ For the sake of this study, the name of sustainability reporting will be used since it has been identified as the most widely spread.

world have started reporting on performance in other domains than just in the financial one (Skouloudis, Evangelinos, & Kourmoussis, 2009). Under sustainability reporting, evaluating social and environmental performance is nowadays fully part of the reporting process as a way for organisations to demonstrate their accountability efforts. As such reporting practices are becoming a universal trend, the body of academic and corporate research on this topic is also growing. Research on definitions of sustainability reports, on motivations for their development, and on the content of such reports is widely available (Roca & Searcy, 2012).

2.1.1 What is sustainability reporting

Unlike for sustainable development, no universally accepted definition of sustainability reporting stands out. However, the published literature proposes several definitions. For example, the World Business Council for Sustainable Development (WBCSD) defines sustainable development reports as “*public reports by companies to provide internal and external stakeholders with a picture of the corporate position and activities on economic, environmental and social dimensions*” (WBCSD, 2002, p.6). Similarly, Daub (2007) defines a sustainability report as a report which “must contain qualitative and quantitative information on the extent to which the company has managed to improve its economic, environmental and social effectiveness and efficiency in the reporting period and integrate these aspects in a sustainability management system.” According to GRI (2006), sustainability reporting is a practice that includes (1) measuring, (2) disclosing and (3) being accountable to both internal and external stakeholders for organisation performance, with the goal of sustainability in mind. GRI (2006) also adds that a SR should provide a representation of the sustainability performance of a reporting organisation, including both positive and negative contributions. Summarising, it seems clear from the vast literature on sustainability reporting that a SR must inevitably include reporting on long-term profitability, social justice, and environmental concerns, i.e. TBL (Daizy, Sen, & Das, 2013b; GRI, 2006).

2.1.2 Evolution of sustainability reporting

While the first traces of financial reporting come from the 19th century, it was only in the 1970s that it was extended to social issues. At this time, the main focus was to provide stakeholders with an overview of the company’s activities, products and services as well as of the company’s social impacts (Herzig & Schaltegger, 2006). It was in the late 1980s and early 1990s that environmental reporting emerged with a particular attention to the level of environmental impact, e.g. air emissions, linked to companies. Environmental reporting was mostly driven by environmental disasters in 1980s such as Bhopal, Chernobyl, and Brent Spar requiring companies to work on societal legitimisation and therefore transparency. Since the mid-1990s, the main trend is to publish sustainability reports integrating the three aspects of sustainability, i.e. financial, social and environmental (Herzig & Schaltegger, 2006). Also, a study undertaken by KPMG (2013) emphasizes that nowadays, reporting on sustainability goes beyond a simple nicety and is considered to be a constituent of success in the developed market (Lynch, Lynch, & Casten, 2014). Consequently, sustainability reporting is on the rise and will continue to evolve (English & Schooley, 2014). According to a KPMG survey (2013), 93% of the 250 global largest companies are reporting on corporate responsibility issues (N. C. Lynch et al., 2014).

The upward trend in sustainability reporting was even more strengthened by the transition from voluntary to mandatory disclosure requirements in some places of the world – these requirements were not only mandated by stakeholders but also by regulations (English & Schooley, 2014). Indeed, in a couple of country such as Australia, Denmark, Finland, South Africa, and the United Kingdom, these disclosure processes are regulated under national legislation (Lynch et al., 2014). Similarly, the European Parliament just adopted on the 15 April 2014 a directive on disclosure of non-financial and diversity of information by large companies and groups. It will therefore be mandatory for larger companies within the European Un-

ion (EU) to disclosure on their environmental and social performance (European Commission, 2014).

Even though there is an increasing trend regarding the quantity of environmental and social information disclosed, the ways organization publish this information are multiple, e.g. part of the business plan or separate, etc. Looking ahead, the next stage for sustainability reporting is what businesses and scholars call integrated reporting (IR) (English & Schooley, 2014; GRI, 2013; Lynch et al., 2014). Currently seen as an emerging and evolving trend, IR represents the full integration of environmental and social sustainability performance into a company's regular's financial disclosure. In other words, instead of publishing separate financial and sustainability reports, companies will integrate information from the two reports into one comprehensive report (English & Schooley, 2014), so that sustainability performance is indistinguishable from other key business disclosures (Lynch et al., 2014). Although the concept is still new, IR has gained ground in recent years, particularly in countries such as Denmark and South Africa, where it is compulsory for companies to publish one joint report on financial and sustainability topics (English & Schooley, 2014). The recent publication in December 2013 of an International Integrated Reporting Framework was an additional step for IR. This framework was developed by the International Integrated Reporting Council (IIRC), a global coalition of experts with experience in various areas and industries, for the ultimate purpose of embedding IR into mainstream business practice (IIRC, 2014b).

2.1.3 The Global Reporting Initiative (GRI)

When talking about the evolution and current situation of sustainability reporting, one has to grant a section to the currently leading organisation in this field. The Global Reporting Initiative (GRI) is a non-profit organisation founded in 1997 in Boston and originates from the joint work of the US non-profit organisations the Coalition for Environmentally Responsible Economies (CERES) and the Tellus Institute (GRI, 2014). GRI has several global strategic partnerships and was, for example, formally inaugurated as a United Nation Environmental Programme (UNEP) partner organisation in 2002 (GRI, 2014). As previously mentioned, GRI operates in the sustainability field and more specifically aims to promote the use of sustainability reporting amongst organisations. GRI has developed comprehensive Sustainability Reporting Frameworks that help organisations prepare their SR, regardless of their size, sector or location (GRI, 2014).

In 2000, the first version of guidelines developed by GRI, known as G1 Guidelines, was launched. Due to the need to respond to the constant changes in the business world (T. Bergkamp, personal communication, July 16, 2014), the first version has been succeeded by three updated versions so far. In 2002, GRI unveiled the second version of their sustainability reporting guidelines, G2 Guidelines. The third generation of guidelines was proposed in 2006 with the G3.0 version and the participation of more than 3,000 experts from business, civil society and the labour movement made it a real success. Also, since the Guidelines are often combined with other international frameworks and guidance, GRI further extended its collaboration efforts by creating partnerships with organisations such as the United Nations Global Compact, the Organisation for Economic Co-operation and Development (OECD), etc. (GRI, 2014). In the meantime, sector-specific guidance, called Sector Guidelines, was produced to respond to certain sector-specific needs. The G3.0 Guidelines were updated and complemented in 2011 by a new version, called G3.1. In May 2013, the latest generation of GRI guidelines to date was released; the G4 Sustainability Reporting Guidelines. Nowadays, thousands of organizations worldwide use the GRI Guidelines to report their sustainability performance (GRI, n.d.). In the KPMG Survey of Corporate Responsibility Reporting 2013, KPMG revealed that the use of the GRI Guidelines is almost universal, with 78% of the reporting organisations referring to the GRI Guidelines in their reports. This rate is 82% for the world's 250 largest organisations (KPMG, 2013b). As an understanding of the newest guide-

lines is crucial for the rest of this thesis's methodology, the two latest generations, i.e. the G3 and G4 Guidelines, - along with the Sector Supplements and the Topics for Sector, are explained in further details in the following sections.

The third generation, G3

The third version of Sustainability Reporting Guidelines, hereafter G3, consists of two main parts: "Reporting Principles and Guidance" and "Standard Disclosure" (including Performance Indicators). These two parts are given equal weight and importance by GRI (GRI, 2006) and are further elaborated in the following paragraphs. Firstly, "Reporting Principles and Guidance" provides guidance (1) to define the report content, (2) to ensure the report quality and (3) to set report boundaries. These three sections contain principles such as materiality, stakeholder inclusiveness, sustainability context as well as completeness. Secondly, "Standard Disclosure" describes the standard disclosure that a SR should contain. The guidelines are generic and therefore propose information that is relevant and material to most organisations and of interest to most stakeholders. The Standard Disclosures are divided into three categories:

- (1) Strategy and profile: disclosures that lay the foundation for understanding organisational performance, with key themes such as strategy, profile and governance.
- (2) Management approach: disclosures that provide insight on how the management system of the organisation addresses a certain set of comparable sustainability topics.
- (3) Performance indicators: indicators, i.e. topics, which encompass comparable information in terms of the economic, environmental and social performance of an organisation (GRI, 2006).

Within the third category, GRI differentiates two types of indicators. Core indicators are those identified as material for most organisations as well as of interest to most stakeholders. Additional indicators represent emerging practices or address topics that may be material for some organisations but are generally not for the majority (GRI, 2006). GRI does not constrain companies to report on every core and additional indicators. However, omitting an indicator has to be justified (GRI, 2006), e.g. "not relevant for our company", "no data available yet", etc. Furthermore, based on the organisation's level of compliance to the GRI Guidelines, an organisation can declare an "Application Level", which is a level representing the degree of transparency of an organisation's SR as determined by the Guidelines. GRI has identified three Application Levels : A, B, C. Level A is for organisations with the most advanced SR, level B is for organisations with advanced SR and level C is for beginners in the sustainability reporting field (GRI, 2006). In addition, for each of the Application Levels, the sign "+" can be added to the Level when an organisation has externally assured its reporting. Third party certification is not required by GRI but has the potential to enhance credibility and transparency (GRI, 2006).

This study focuses on Key Environmental Performance Indicators (KEPI) only (cf. Section 1.5, scope and limitations). In the environmental category, GRI identified 9 aspects, under which 30 performance indicators, coded as "EN", were designed. These aspects and indicators are enumerated in Table 5.

Table 5 GRI G3.1: Environmental Performance Indicators

MATERIALS		EN17	Other relevant indirect greenhouse gas emissions by weight
EN1	Materials used by weight or volume	EN18	Initiatives to reduce greenhouse gas emissions and reductions achieved
EN2	Percentage of materials used that are recycled input materials	EN19	Emissions of ozone-depleting substances by weight
ENERGY		EN20	NO _x , SO _x , and other significant air emissions by type and weight
EN3	Direct energy consumption by primary energy source	EN21	Total water discharge by quality and destination
EN4	Indirect energy consumption by primary source	EN22	Total weight of waste by type and disposal method
EN5	Energy saved due to conservation and efficiency improvements	EN23	Total number and volume of significant spills
EN6	Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives	EN24	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally
EN7	Initiatives to reduce indirect energy consumption and reductions achieved	EN25	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff
WATER		PRODUCTS AND SERVICES	
EN8	Total water withdrawal by source	EN26	Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation
EN9	Water sources significantly affected by withdrawal of water	EN27	Percentage of products sold and their packaging materials that are reclaimed by category
EN10	Percentage and total volume of water recycled and reused	COMPLIANCE	
BIODIVERSITY		EN28	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations
EN11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	TRANSPORT	
EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas	EN29	Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce
EN13	Habitats protected or restored	OVERALL	
EN14	Strategies, current actions, and future plans for managing impacts on biodiversity	EN30	Total environmental protection expenditures and investments by type
EN15	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk		
EMISSIONS, EFFLUENTS, AND WASTE			
EN16	Total direct and indirect greenhouse gas emissions by weight		

Source: GRI G3.1

Furthermore and as previously highlighted, GRI's third version of Sustainability Reporting Guidelines is itself comprised of two versions, G3.0, launched in 2006 and an updated version, G3.1, published in 2011. With respect to environmental performance indicators, there are only two minor changes from the G3.0 to the G3.1 Guidelines (GRI, 2011). The first change concerns EN9, "water sources significantly affected by withdrawal of water", while the second one affects EN14, "strategies, current actions, and future plans for managing impacts on biodiversity". For both of these indicators, the transition from G3.0 to G3.1 requires indicator data adjustment, rather than the disclosure of new indicators, aspects or management approach (GRI, 2011). Therefore, since the study focuses on the identification of environmental performance indicators, and since no main differences between G3.0 and G3.1 were identified in this section, the study does not distinguish between the two guidelines.

According to previous studies, the most frequently reported indicators are related to GHG emissions (Petrushevski, 2014; Roca & Searcy, 2012; Skouloudis, Evangelinos, & Kourmousis, 2010). More specifically, Roca & Searcy (2012) identified EN16 as the most popular indicator amongst companies. Other aspects such as energy, e.g. indicator EN3, and water are also frequently reported by companies (Petrushevski, 2014; Roca & Searcy, 2012; Skouloudis et al., 2010). Regarding the less frequently reported indicator, EN25 has got the lower rate according to Roca & Searcy (2012).

The fourth generation, G4

Given that the fourth generation, hereafter G4, was launched in May 2013, many organisations are still in the transition stage. Even though most ports under analysis are still using G3, an understanding of G4 is of significant importance to this thesis, as reports published after 31 December 2015 will have to be prepared in accordance with G4 (GRI, 2013a). The major changes observed from G3 to G4 are the following: the concept of materiality is even more emphasized, the reporting boundaries are redefined, “In Accordance” levels replace A, B, C, and there are new governance disclosure and supply chain requirements (KPMG, 2013a).

Under this study, the three major changes in materiality (1), boundary setting (2) and new supply chain requirements (3) are of most importance.

- (1) Materiality refers to the fact that information found in a SR should cover topics and indicators that reflect the organisation’s significant economic, environmental and social impacts or that would influence the evaluation and decisions of stakeholders. In other words, organisations should report on sustainability information that matters the most to their business, rather than disclosing information on everything (GRI, 2013a).
- (2) For each Material Aspect, organisations must assess whether the impact of the issue lies inside or outside the organisation. Therefore, it requires organisations to define the “Boundary” of their impact, i.e. what do they have control over or influence on. While G3 requires organisations to report on inside impacts only, G4 promotes reporting on a broader range of impacts, i.e. also those impacts considered to be outside the organisation’s control.
- (3) G4 gives more prominence to supply chain issues and requires organisations to report on how they manage issues related to the material impacts of their supply chains. Supply chain issues include details on supply chain assessments, risks identified, etc. (GRI, 2013a). The G4 also proposes six new environmental indicators⁹ (cf. Table 6).

Table 6 Changing from the G3 to the G4 GRI Guidelines: the new environmental performance indicators

Indicator	Aspect and description
ENERGY	
G4-EN5	Energy intensity
G4-EN6	Reduction of energy consumption
G4-EN7	Reductions in energy requirements of products and services
EMISSIONS	
G4-EN18	Greenhouse gas (GHG) emissions intensity
G4-EN19	Reduction of GHG emissions
SUPPLIER ENVIRONMENTAL ASSESSMENT	
G4-EN32	Percentage of new suppliers that were screened using environmental criteria
G4-EN33	Significant actual and potential negative environmental impacts in the supply chain and actions taken
ENVIRONMENTAL GRIEVANCE MECHANISMS	
G4-EN34	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms

Source: GRI

⁹ Since GRI re-arranged the whole set of indicators, one indicator under G3 does not necessarily refer to the same coded-one under G4.

Sector supplements

Many sectors encounter unique sustainability issues that should be encompassed in a SR. However, these issues may not be entirely covered in the generic Reporting Guidelines. Therefore, GRI established a sector working groups that used a global multi-stakeholder approach to develop Sector Guidance, also known as Sector Supplements. These Sector Supplements aim to complement the generic Guidelines both by giving recommendations on how to apply the generic Guidelines, and by introducing in a specific sector, while also including sector-specific Performance Indicators (GRI, 2014). Examples of these indicators are noise measurement for airports, the resettlement of people for mining and metals companies, animal welfare for the food processing industry, etc. (GRI, 2014). There are 10 Sector Supplements so far, designed for the following sectors: (1) Airport Operators, (2) Construction and Real Estate, (3) Electric Utilities, (4) Event Organizers, (5) Financial Services, (6) Food Processing, (7) Media, (8) Mining and Metals, (9) NGO and (10) Oil and Gas (GRI, 2014). In addition, there was also a working group trying to establish Sector Supplement for the Logistic sector, but it has never been finalized. The port sector could make use of this draft since the ports are linked to logistics. As stated in the introductory section, there is currently no Sector Supplement developed for the port sector and GRI has not announced that they will develop one. However, some current Sector Supplements could potentially help towards the development of a Sector Supplement for ports. Due to the relative proximity of the airport and port sectors, for example, the Sector Supplement for Airport Operators could be useful when creating the Sector Supplement for ports.

Topics for Sector

Topics for Sector is an extensive GRI research project that aims to collect documentation from different stakeholder groups in order to identify the sustainability topics stakeholders consider to be significant. Researchers set up 52 different business activity groups, which, with the contribution of 194 organisations, produced 2812 Topics. This global research resulted in (1) a list of relevant sustainability topics for different business activities, (2) a reference list that supports these topics as well as (3) a list of the researcher's partner organisations (GRI, 2013b). No sustainability topics for the port sector were developed. Those most closely connected to ports are summarized in Table 7.

Table 7 Identified business activity groups potentially related to the port sector

N. of reference	Business activity group
29	Water Transportation - Water Transportation
30	Water Transportation - Ports and Services
31	Ground Transportation - Railroads Transportation
32	Ground Transportation - Trucking Transportation
47	Electric Utilities and Independent Power Producers and Energy Traders (including fossil, alternative and nuclear energy)
50	Solid Waste Management Utilities

Source: GRI

Topic for Sector should be regarded as a research, rather than as a framework – as it has not been developed in accordance with GRI's *due process*¹⁰ (GRI, personal communication, June 25, 2014). The purpose of this research was to investigate issues related to reporting while also offering innovative ways to put into practice GRI's Reporting Framework (GRI, 2013b).

¹⁰ To be considered a Framework, all GRI's documents must be developed in line with the due process principles approved by the GRI Board of Directors. Amongst other things, these principles include the constitution of a multi-stakeholder GRI working group encompassing business, mediating institutions and labour and civil society (GRI, 2007).

2.2 The port sector

Growing sustainability issues brings new challenges for the port sector. For example, the results of climate change, e.g. the rising sea level, an increase in flooding, have led ports to adopt new appropriate measures to ensure the accessibility and safety of port waterways. In addition to their obvious link to transport, ports are also connected to cities and nature. Growing environmental awareness as well as stricter legislations have brought ports to integrate all these inter-related dimensions in their planning and management (PIANC, 2013b).

2.2.1 Environmental and sustainability aspects

In this context, many scholars have been writing about the concept of “Green Port” or “Sustainable Port”. This concept refers to a port that considers “*green growth as an economic driver and as key to its commercial and operational activities*” (Vellinga, 2011). In addition to giving a definition, scholars also tend to provide a list of aspects characterizing a Green Port. For example, when reviewing the best examples and practices of international ports that have mitigated environmental impacts, GHD (2013) categorizes the aspects into eight main categories: (1) Water and sediment quality, (2) Coastal processes and hydrology, (3) Noise and vibration, (4) Lighting, (5) Aesthetic, (6) Direct ecosystem impacts, (7) Air quality, (8) Invasive species.

These categories of the best technologies or processes were created to be considered for application in the Australian context. The aim of GHD’s research was therefore not to produce an exhaustive list of categories that represent and characterise the Green Port; rather this study simply classified the findings. However, other researchers have been focusing principally on the creation of such a list. In 2012, the European Sea Ports Organisation (ESPO) Green Guide was published in order to introduce a common framework amongst European ports. ESPO’s goal was to provide European ports with a tool to assess their environmental performance, to identify where they stand and what their next steps should be. The Green Guide proposes a course of action following 5Es: Exemplify, Enable, Encourage, Engage and Enforce, and applies these actions to five environmental topics (ESPO, 2012a): (1) Air quality, (2) Energy conservation, (3) Climate change, (4) Noise management and (5) Waste and water management (ESPO, 2012a).

The ESPO Green Guide also encompass main issue such as energy conservation and waste and water management Furthermore, in a literature review, Chiu, Lin, & Ting (2014) identify relevant factors of Green Port operation and highlight five dimensions and thirteen factors as guidelines for Green Port operation: (1) Environmental quality: water pollution, air pollution, land and sediments pollution, noise pollution; (2) Use of energy and resource: energy usage, materials selections and water consumption; (3) Habitat quality and greenery: port greenery, habitat quality maintenance; (4) Waste handling: hazardous waste handling, general waste handling and (5) Social participation: port staff training, community promotion and education.

This framework contributes to the previous lists as it emphasises the social aspects of a Green Port. While Chiu et al. (2014)’s Green Port framework has been identified as one of the most recent in the literature, it focuses on a limited view of Green port operations, excluding other current and more encompassing issues related to a Green Port. More exhaustive lists do however exist. For example, in his paper “*Green Ports. Fiction, condition or foregone conclusion?*”, Vellinga (2011) approaches the concept of Green port through the eyes of the port administrator, using six main themes proposed by international working groups: (1) Spatial planning of the port within its surroundings, (2) Modality management, (3) Information management, (4) Environmental quality (water, soil, air, dredging, noise, etc.), (5) Climate change (mitigation and adaptation) and (6) Nature values, landscape and quality of life

In his article, Vellinga (2011) puts further emphasis on two sub-specific aspects - sediments and dredged material management and compensation area creation, e.g. special protection area or rest areas (Vellinga, 2011). He introduces several new aspects to the concept of Green Port by giving direct attention to spatial planning, modality management as well as information management. Vellinga was also chairman of PIANC's "WG150 Sustainable Ports" (PIANC, 2013b), which identified 13 environmental and sustainability issues related to port operations and their related logistic chains. The resulting work was more than just a categorization, since each issue was extensively documented. The 13 issues are the following: (1) Land and water areas uses; (2) Modalities and connectivity; (3) Air quality; (4) Surface water and sediment quality; (5) Soil and groundwater quality; (6) Dredging impacts; (7) Sound impacts; (8) Energy and climate change mitigation; (9) Climate adaptation, (10) Habitat and species health; (11) Landscape management and quality of life; (12) Ship Related Waste Management; and (13) Sustainable Resources Management.

Some scholars have also been determining the priority issues from these lists by weighting each criterion. For example, the top five priority attributes identified by T.-K. Chiu & Wang (2014) are hazardous waste handling, air pollution, water pollution, port greenery and habitat quality maintenance. With the insights of scholars, port authorities and shipping companies, Sheu, Hu, & Lin (2013) identified the following priorities: to equip preservative energy facilities, port energy, to promote friendly relationships, tax incentives and rewards and waste dumping management.

Another angle of approaching a framework structure is proposed by Lam & Notteboom (2012). After comparing and analysing the port management tools of leading ports in both Asia and Europe, they propose a "Green Port toolbox". It gathers issues into three main "boxes": (1) policy pricing, (2) monitoring and measurement and (3) regulatory control.

- (1) Policy pricing can refer to either penalty or incentive pricing. The former usually implies fines on pollution damage or non-compliance to regulation, therefore acting as a "stick" for the wrong doers. The latter acts as a "carrot", providing (financial) incentives for good doer companies. One example is the Environmental Ship Index (ESI), which provides registered ships with a score ranging from 0 to 100 (from in conformity with regulations to emission free). This score then can be transferred into advantages decided upon by each ports (WPCI, n.d.).
- (2) Monitoring and measuring enable ports to publicly communicate how environmental impacts are being managed, i.e. licence to operate, while also enabling ports to keep track of their performance and adjust their target. For example, many ports nowadays monitor their carbon footprint (GHG expressed in CO₂ equivalent), utilize an Environmental Management System (EMS) and publish sustainability reports.
- (3) Regulatory control is used as a compulsory tool that restrains market access control and prescribes environmental standards, setting a baseline for port operations. Although regulation exists at various levels, a well-known example of international regulation is the International Convention for the Prevention of Pollution from Ships (MARPOL). It was adopted by the International Maritime Organisation and legally binds each signatory country in MARPOL (Lam & Notteboom, 2012).

2.2.2 Sustainability reporting for ports

Current studies on sustainability reporting in the port sector are mainly driven by the sector. The present section aims to provide an overview of these various initiatives.

National initiatives

Spanish system, INDAPORT, MESOSPORT

INDAPORT is a study published in 2004 with the goal of developing a system of sustainable environmental management indicators to be used by port authorities. It was led by the Public Agency Ports of the State (*Puertos del Estado*) and was based on a case study of the Port of Valencia where an environmental analysis of port activities was undertaken. Eventually, the research was to be applied to the Spanish system in general. The outcome was the identification of twenty-one port activities, seventeen environmental indicators and the associated potential environmental impacts (Peris-Mora, Alvarez, Orejas, Subirats, & Ibáñez, 2005). A table presenting these categories is provided in Annex 4. In addition, a “Sustainability Reporting Guide for the Spanish Port Sector” was published in 2008 under the name of MESOSPORT. The project was initiated by the FEPORTS Foundation and also involved the participation of the La Coruña Port Authority. Taking the form of a handbook, the MESOSPORT guides Spanish ports in the development of their SR by providing guidelines and recommendations. Furthermore, it compiles a series of economic, social and environmental indicators tailored to the particular characteristics of Spanish port authorities (Soler, Orejas, Fillol, & Feliu, 2009). It was developed based on the previous work of INDAPORT as well as on the GRI and Balanced Scorecard (BSC)¹¹. A table of the environmental indicators developed by MESOSPORT can be found in Annex 5. The main difference between the INDAPORT and MESOSPORT is that the latter focuses on the three pillars of sustainability, i.e. economic, environment and social, while the former concentrates its work on environmental indicators only.

European initiatives

EcoPorts, SDM and PERS

Under the ESPO, an EcoPort network was created as a way to set the basis for cooperation amongst ports and to share the use of two tools. Firstly, an Ecoport certification can be obtained by any ESPO member upon completion of a Self-Diagnosis Method (SDM) checklist. The SDM is not premised on a “pass or fail” basis but rather aims to provide ports with a checklist against which they can self-assess their environmental management with both the European and international standards in mind. Ultimately, the checklist should help managers identify goals and set up a priority list (ESPO, 2014)¹². Secondly, additional credit is given to members using the port-specific management standard, or the Port Environmental Review System (PERS), which was developed in combination with ISO 14001 (ESPO, 2014). These two tools – SDM and PERS - are accessible by joining the EcoPort network.

PPRISM project

On the EU level, the European Sea Ports Organization (ESPO) has paved the way for a culture of performance measurement in European ports by launching the PPRISM project (Port Performance Indicators: Selection and Measurement). This project, co-funded by the European Commission, was a 25-month-long cooperation between the academic world and the port industry that aimed to identify a set of indicators for the EU port system (ESPO, n.d.). The outcome of the PPRISM project is a short list of indicators that will ultimately provide a

¹¹ BSC is a strategic planning management tool for organisations to (1) align their activities to their visions and strategy, (2) monitor their performance against their goals and (3) manage communication with their stakeholders (BSC, 2014)

¹² From 2004 to 2013, a 33% increase in published environmental reports was noticed due to SDM (ESPO, 2013)

basis for a Port Sector Performance Dashboard. The dashboard will contain indicators relevant to the port sector that are well accepted by stakeholders and will enable ports to follow performance trends in the European port sector. One should note however that the Dashboard focuses on the port system as a whole rather than assessing the performance of individual ports (ESPO, n.d.).

In this context, PPRISM highlights a set of indicators within 5 performance categories: market trend and structure, socio-economic impact, environmental performance, logistic chain and operational performance, and governance (ESPO, 2012b). For the sake of this study, only the KEPI category will be further explained. While the PPRISM project started with an initial list of 125 KEPIs, the list was eventually reduced to 7. The 7 proposed KEPIs are distributed into three quantitative measures, i.e. Carbon footprint, waste management, water consumption, and one qualitative measure, i.e. appropriate EMS (ESPO, 2012b). For the quantitative measures, ports were asked in 2013 to provide links to publicly available information regarding their carbon footprint, their waste management and their water consumption. Results showed that the availability of public data regarding these three topics is limited; 25% of the respondents provided a link to their environmental report. Even smaller percentages provided data on their carbon footprint, waste management and water consumption (ESPO, 2013). The final list of environmental indicators can be found in Annex 6.

Port Performance Dashboard

Building on the PRISMM project, ESPO undertook a port performance data collection, named ESPO Port Performance Review 2013, which would eventually aim to contribute to the Port Performance Dashboard 2013. The Dashboard is divided into five main areas: market trends and structure, socio-economic performance, intermodal container connectivity, governance, and environment. The environmental part of the Port Performance Review 2013 gathered data from 79 ports in 21 European States (ESPO, 2013). From the data provided by the participants, a list of the top-ten environmental priorities was elaborated. Table 8 provides an overview of these environmental priorities over time.

Table 8 Top ten environmental priorities of the European port sector over time

	1996	2004	2009	2013
1	Port Development (water)	Garbage / Port waste	Noise	Air quality
2	Water quality	Dredging: operations	Air quality	Garbage/ Port waste
3	Dredging disposal	Dredging disposal	Garbage/ Port waste	Energy Consumption
4	Dredging: operations	Dust	Dredging: operations	Noise
5	Dust	Noise	Dredging: disposal	Ship waste
6	Port Development (land)	Air quality	Relationship with local community	Relationship with local community
7	Contaminated land	Hazardous cargo	Energy consumption	Dredging: operations
8	Habitat loss / degradation	Bunkering	Dust	Dust
9	Traffic volume	Port Development (land)	Port Development (water)	Port development (land)
10	Industrial effluent	Ship discharge (bilge)	Port Development (land)	Water quality

Source: ESPO

As shown in Table 8, European ports now consider air quality to be the number one environmental priority. This reflects the increasing concern about the impact of air quality on human health and is in line with various national and regional legislations dealing specifically with this issue. Many efforts have been made to reduce vessels' exhaust emission of air pollutants. In second place, port waste and garbage remain an important issue for the sector, followed by energy consumption, which first entered the priorities list in 2009. Even though the importance of noise has declined since 2009, it still remains an important topic for European ports and is closely followed by a new priority since 2013 - ship waste. The topic of ship waste has been given particular attention by the recent debate on suitable port facilities to greet increased volume and new types of ship waste, e.g. scrubber generated. Relationship with local community has stayed in the middle of the ranking since its entry to the list in 2009, while dredging operations, dust and port development have constantly stayed a priority since 1996. Finally, water quality reappeared in the 2013 top-10 environmental priorities of the European port sector after being highly ranked in 1996 and absent in both 2004 and 2009 (ESPO, 2013).

In addition to the top-10 environmental priorities, ESPO has also identified EMS-related issues as increasingly significant indicators in the port sector. Indeed, when participant ports provided data linked to their environmental management, an increased awareness and inclusion of EMS-related topics was observed (cf. Table 8). Topics covered by ESPO under the EMS umbrella are the following: environmental policy, ESPO guidelines, environmental legislation, significant environmental aspects, objectives and targets, environmental training, environmental monitoring and environmental reporting. Focusing on the final component, 62% (out of the 79 ports interviewed) responded positively, i.e. had created an environmental report. Furthermore, 90% gave positive responses for environmental policy and environmental legislation, 85% for significant environmental aspect and objectives and targets, and nearly 80% for environmental monitoring (ESPO, 2013).

PORTOPIA

Following the PPRISM project, the PORTOPIA project further develops the ESPO work regarding sustainability indicators. PORTOPIA is also co-founded by the European Commission and is collaborative research under FP7 (Seventh Framework Project). The project mainly focuses on the port performance management system and resulting indicators. One of PORTOPIA's objectives is the creation of a sustainable learning and self-improvement platform for the whole port industry and its stakeholders. More specifically, the desired end-result of the project is *“a state-of-the-art, sustainable, self-supporting European Ports Observatory, endorsed by port stakeholders, that provides superior value to the industry and its stakeholders by supplying transparent, useful and robust indicators and the contextual analysis of thereof, leading to improved resource efficiency, effectiveness and societal support for the European Port System”* (PORTOPIA, 2014). PORTOPIA was recently launched at the ESPO Conference 2014 on 14 and 15 May.

International initiatives

PIANC and LAPH WG174

The “WG150 Sustainable Ports” drew up a list of recommendations providing a baseline for sustainable ports. Based on the observation that sustainability reporting approaches vary from port to port, one of the working group's recommendations was to provide more guidance for ports in this field. Therefore, following “WG150 Sustainable Ports”, another working group, “WG174 Sustainability Reporting for Ports”, has been launched with the hope of harmonising port sustainability reporting. Since many port sustainability reports are based on the GRI guidelines, the working group hopes to draft a sector supplement to the GRI guidelines for ports, or the equivalent (cf. Section 1.2) (PIANC, 2013a).

3 Literature Review

The previous chapter aimed to lay the foundations for this thesis by introducing the subject in a relatively descriptive way. The present chapter however, carries out an in depth-analysis of the literature on sustainability reporting. In addition to explaining the dynamics of and different viewpoints on sustainability reporting, the literature review also contributes to the development of the present thesis research method. Therefore, this chapter concludes with a section on how the present thesis has adopted previous scholars' methodologies.

3.1 Theories for sustainability reporting

The diversity of indicator disclosed in the port sector was fairly quickly noticed in this research (cf. Section 1.4). In this context, several possible theoretical explanations for the wide variety of indicators disclosed were identified. Among the theories that give an explanation for non-financial reporting, social and political theories have been identified in the literature as the most relevant. More specifically, three particularly insightful perspectives are provided by (1) political economy (2) legitimacy and (3) stakeholder theories. Although these theories obviously overlap and should therefore be seen as complementary (Deegan & Rankin, 1997; Gray, Kouhy, & Layers, 1995; Jupe, 2005; van der Laan, 2009), they are separately discussed in the following sections.

3.1.1 General theory for sustainability reporting

Political economy is defined variously depending on perspective, e.g. classical vs. bourgeois perspectives. However, what connects the different sub-streams of political economy theory is the recognition that the economic domain should not be analysed in isolation from the political, social and institutional framework wherein the economic takes place. Using a corporate lens, political economy theory relies on the idea that organisations are part of economic and social systems and must therefore be studied within the framework of these systems (Jupe, 2005). The link between corporate social and environmental responsibilities seems obvious since, for example, CSR is commonly presented as the recognition that the economic part is only one element (usually complemented by environmental and social aspects) in the organisational life (Gray et al., 1995). Consistent with the political economy perspective, Mitchell Williams, (1999) found that the socio-political and economic system of a nation plays a role in shaping the perceptions of organisations releasing voluntary environmental and social disclosures. In the field of regulated sustainability disclosure, Haigh & Guthrie (2009) obtain a mixed result when analysing the correlation between the quality of Australian regulated information disclosures and legislators' objectives. The last two studies mentioned explicitly use political economy theory as a main framework to explain sustainability disclosure. It has been found however that most scholars focus their work on a narrower perspective, e.g. using stakeholder and/or legitimacy perspective.

3.1.2 Specific theories for sustainability reporting

Stakeholder and legitimacy perspectives are very similar and are derived from the broader political economy theory. While Stakeholder theory explains voluntary disclosure as the result of stakeholder accountability, legitimacy theory sees it as part of a legitimisation process.

Legitimacy theory

Legitimacy theory has its root in the concept of social contract. Initially used by academics to reflect on the legitimacy of the authority the state has over society, the concept of social contract can also represent the relationship between an organisation and the society to which it is indebted. Legitimacy theory is therefore based on the assumption that in order to continue operating successfully, companies must proceed within the bounds and norms of what society

determines as socially acceptable (O Donovan, 2002). As a result, companies with a weak sustainability performance record may have difficulties obtaining the necessary support and resources to continue operations in a society that values sustainability. Unless organisations initiate strategies, such as sustainability reporting, society may revoke their “social contract” (Deegan & Rankin, 1997). Consequently, sustainability reporting is seen as part of the process of legitimisation providing organisations with a “license to operate” (O Donovan, 2002). It is a way for organisations to shape society’s perception of their operations in order to maintain or establish the view that they respond to society’s expectations, i.e. that the organisations respect the social contract (Deegan & Rankin, 1997).

In a longitudinal study of UK disclosure, Gray, Kouhy, & Layers (1995) reached the conclusion that practices related to CSR are too complex to be explained by a single theoretical framework. Despite Gray et al. (1995)’s findings, many studies exclusively use the legitimacy theory as their main framework for analysing sustainability reporting (e.g. Deegan & Rankin, 1997). The results of all these studies are various: some studies supporting the legitimacy theory (e.g. O’Dwyer 2002, O Donovan, 2002, Jupe, 2005, Ernst & Young 2010) and other studies discredit the idea that legitimacy theory explains non-financial disclosure (Manetti & Toccafondi, 2014; Wilmshurst & Frost, 2000).

Stakeholder theory

With his publication of “Strategic Management – A Stakeholder Approach”, Freeman (1984) popularised both the concept of the stakeholder and the related Stakeholder theory. As explained in Freeman’s work (1984), Stakeholder theory relies on the fact that organisations have obligations to many groups which both affect and are affected by the organisation. These groups, i.e. stakeholders, are both internal and external to the organisation and include customers, suppliers, employees, shareholders, the community, the environment, etc. Under the Stakeholder theory, the interaction between stakeholders and the organisation is a reciprocal one. Stakeholders provide vital resources and/or contribute to the organisation, and the firm should cater to stakeholder demands (Huang & Kung, 2010). Consequently, the organization’s management needs to identify their stakeholders - those who have “a stake” in their organisation - and manage relationships with them (Elijido-Ten, 2009). A primary difference of opinion within the Stakeholder theory concerns the level of importance of various stakeholders (Manetti & Toccafondi, 2014). On the one hand, some argue stakeholders all have intrinsic rights and therefore no set of interests is assumed to be dominant to another. On the other hand, some think that prioritizing stakeholders is unavoidable, since stakeholders do not all have the same level of strategic importance for the organisation (Convergent Stakeholder theory).

An important work in the field of stakeholder theories is Ulmann (1985)’s, which proposed three dimensions of social responsibility disclosure. The first dimension, *stakeholder power*, reflects the firm’s responsiveness to the intensity of stakeholders’ demands. The second dimension of disclosure, *strategic posture*, highlights the mode of response the firm is most likely to take. Finally, the third dimension, *economic performance*, suggests that there is a substantial cost in becoming environmentally responsible, which makes the firm’s economic situation a factor in determining its environmental efforts. Scholars have based their work on these three dimensions. For example, according to Elijido-Ten (2009), the first two dimensions are significant factors in the environmental disclosure of Malaysian companies, while the third one is not.

In light of the Stakeholder theory, sustainability reporting - as a strategic tool (Fernandez-Feijoo, Romero, & Ruiz, 2014) - must provide stakeholders with the information that they require in order for the organisation to maintain or gain their support (Dobbs et al., 2012). Sustainability reporting – as a means of communication (Huang & Kung, 2010) - is seen as a

channel through which firms can respond to their stakeholders' needs. When creating a sustainability report, an organisation must consider all its stakeholders' demands. Since stakeholders look at an organisation's strategies as well as its stance on and devotion to environmental and social issues, they are pleased to see economic performance which does not alter the environment (Huang & Kung, 2010). This statement is especially true since stakeholders are increasingly paying attention to the social and environmental implications of organisations' activities (Alazzani & Wan-Hussin, 2013). In this context, scholars have analysed sustainability reporting through the lens of Stakeholder theory (e.g. Fernandez-Feijoo et al., 2014; Huang & Kung, 2010; Manetti & Toccafondi, 2014). More specifically, scholars also use the Stakeholder theory as a means to explore a theoretical justification of sustainability disclosure, i.e. does the Stakeholder theory help explain the act of disclosure. For example, Dobbs et al. (2012) aim to contribute to the debate on which theories explain sustainability disclosure and investigated drivers for voluntarily reporting on sustainability information in New Zealand. They found that accountability is not the reason why companies voluntarily report sustainability information. Some studies do however support the Stakeholder theory as an explanation for sustainability disclosure (e.g. T.-K. Chiu & Wang, 2014; Eljido-Ten, 2009, Husillos & Álvarez-Gil 2008).

3.2 Drivers for reporting

Link to the previous section, many scholars have also pointed to the importance of understanding why there is such a wide diversity of reports, especially when such a diversity exists in the same sector. In order to make sense of this variety, many scholars start with a more elementary question: what is the rationale behind sustainability reporting, i.e. why do corporations engage in non-financial reporting? The following drivers for disclosure have been identified from previous literature reviews (Morhardt, Baird, & Freeman, 2002; Wilmshurst & Frost, 2000):

- To comply with regulatory requirements and to proactively reduce the cost of future compliance;
- To comply with industry environmental codes, especially when non-compliance sanctions are involved;
- To reduce operating costs;
- To promote relations with stakeholders, including the community, financial institutions, suppliers, customers and environmental lobby groups;
- To satisfy the shareholder/investor right to information;
- To align with competitor response to environmental issues;
- To improve the perceived environmental visibility of the firm;
- To potentially yield competitive advantages;
- To prevent a lack of active environmental management from leading to a questionable organisational legitimacy;
- To respond to both their sense of social responsibilities and their desire to cohere to societal norms;
- To provide a "true and fair" view of operations.

Looking at it from the opposite perspective, Dobbs et al., (2012) identified potential reasons for not reporting:

- There is no demand either from inside or outside the organisation;
- The organisation has never considered it;
- It is too time-consuming;
- It is too costly;

- The organisation thinks they have nothing to report;
- The organisation thinks reporting is not relevant for its industry;
- It was simply a manager's decision not to report;
- None of the organisation's competitors are reporting;
- The organisation currently does not have adequate expertise or resources.

While some research showed that companies truly do want to report (C. A. Adams & McNicholas, 2007), other research underlined a lack of desire to be accountable (Carol A. Adams, 2004), or even showed that SRs were used as an attempt to tone down environmental disturbance and issue (e.g. Larrinaga-González, Carrasco-Fenech, Caro-González, Correa-Ruíz, & Páez-Sandubete, 2001). To sum up, the literature review reveals various reasons why companies engage in sustainability reporting. For the sake of this research, the researcher identifies four main categories why ports do - or do not - report on certain indicators: data availability, public relation impression, genuine differences and different stages of evolution. This classification reveals that some reasons are considered more legitimate than others. These reasons serve as the driving hypotheses of present thesis and are further detailed in the introduction chapter.

3.3 Criticism addressed to sustainability reporting

While sustainability reporting has been described in the first chapter in a rather neutral –or positive- way, the previous sections highlighted issues related to sustainability reporting. Criticism addressed to sustainability reporting can be summarised as follows:

- Standards such as SR frameworks are limited by the fact that standardizers cannot claim hierarchical authority. Therefore, the spreading and overlap of standards makes deciding between initiatives difficult for many managers (Gilbert et al., 2011).
- Companies reporting on sustainability are not subject to sanctions or enforcement mechanisms, which jeopardizes the level of compliance with the standard (Gilbert et al., 2011).
- There is a question of whether an SR actually portrays genuine effort to report performance (Roca & Searcy, 2012) or whether it is being utilised to manage companies' images (Dobbs et al., 2012). Behnam & MacLean (2011) refer to this issue as decoupling. Decoupling enables organisations to stay in line with standards, therefore legitimising their formal structures while their activities vary when it comes to practical considerations. In this case, an SR is a sort of window dressing, since it exists in name only and does not lead to significant improvement in corporate accountability (Behnam & MacLean, 2011).
- There is also uneven disclosure amongst companies. There is a significant diversity of names used to refer to these reports, of the length of reports, and of the quality and number of indicators reported. These differences highlight both the lack of agreement regarding the information that organisations should report on and the consequent difficulty of developing standard indicators that are broadly relevant (Roca & Searcy, 2012).

Criticisms have also been specifically directed at GRI as a provider of sustainability reporting framework. Indeed, even though the GRI Guidelines are considered by many (e.g. Daub, 2007) to be the most commonly used international reporting guidelines, GRI has to face and tries to address many criticisms:

- For many organisations characterised by indirect impacts, the GRI Guidelines are difficult to implement. Indeed, for organisations operating in the mining or automotive sectors, it seems obvious that a reporting process should require them to focus on the specific part of business where the most significant, i.e. direct, impact occurs. However, some companies' most significant impacts rely on other organisations' sustainability performance (A. Månsson, personal communication, June 19, 2014). This is the case for the port sector if the reporting boundaries are limited to the port authority only, rather than to the whole port area. Since GRI is a company with indirect impact, it hoped to show other companies how to address indirect impact within the Framework (GRI, n.d.).
- The Guidelines are drafted in a fairly generic way, which can be regarded as both a strength and a weakness. By proposing guidelines to organisations regardless of their size, sector or location, GRI opens the door to global standardisation. However, the generic characteristic of the Guidelines makes the reporting process difficult for many organisations (Daub, 2007). It leads to various interpretations of the guidelines, which is detrimental to the goal of standardisation (Moneva, Archel, & Correa, 2006).
- The GRI Guidelines do not compel organisations to report all indicators. This makes it difficult to compare reports, which in turn results in weak accountability (Behnam & MacLean, 2011). The potential omission of indicators also gives companies a relatively large freedom on how to use the Guidelines, i.e. do I report on what I am good at or on what actually matters to my organisation? With the development of Sector Guidance (cf. Sector Supplements), GRI responds to this criticism. Indeed, the Sector Guidance enables certain sectors to approach their SRs in a less generic way. The fourth generation of Sustainability Reporting Guidelines puts even more emphasis on the concept of materiality, i.e. reporting on what actually matters for the organisation (cf. The fourth generation, G4).

3.4 Sustainability reporting assessment methodologies

When assessing the content of SRs, three main methods have been widely used amongst scholars (e.g. Evangelinos, Skouloudis, Nikolaou, & Filho, 2009): content analysis methods, scoring methods and questionnaire surveys.

3.4.1 Content analysis

Broadly, content analysis is referred to as “the application of scientific methods to documentary evidence” (Holsti, 1969, p.5). With his extensive literature review, Holsti, (1969, p. 608) first introduced this method and defined it as a “*technique for making inferences by objectively and systematically identifying specified characteristics of messages.*” More specifically, content analysis is defined as a method for collecting and assessing information through the coding and quantification of data in qualitative, quantitative or both evaluations (Holsti, 1969). On the one hand, a quantitative approach is mostly used to count message units and identify themes, trends, and the extent of coverage on a certain topic. On the other hand, the qualitative perspective is oriented towards the meaning of the information (Bernard & Ryan, 1998). The majority of studies use the following measuring reference marks: number of documents (such as reports or advertising brochures), number of sentences per page, number of words per page and number of pages of annual reports associated with any type of environmental information (Evangelinos et al., 2009). Content analysis can also be categorized by other characteristics, such as the type of information reported (monetary vs. nonmonetary, qualitative vs. quantitative), the frequency of the publication, the type of the report, etc. (Evangelinos et al., 2009). So far, many researchers have applied content analysis to assess SRs (e.g. Alazzani & Wan-Hussin, 2013;

Dobbs et al., 2012; Evangelinos et al., 2009; Huang & Kung, 2010; Jupe, 2005; B. Lynch, 2010; Manetti & Toccafondi, 2014; A. Skouloudis, Jones, Malesios, & Evangelinos, 2014; Wilmshurst & Frost, 2000). Context analysis is especially used when evaluating SRs against GRI's requirements (Evangelinos et al., 2009, 2009; Morhardt et al., 2002; A. (1) Skouloudis et al., 2009). In this context, content analysis enables researchers to compare SRs, while also drawing conclusions based on the absence or presence of certain words, topics and ideas.

3.4.2 Scoring methodologies

The scoring method aims to classify and quantify sustainability information into nominal categories by allocating adequate scoring symbols (Holsti, 1969). It is a method widely used by scholars to assess and compare companies' sustainability disclosure performance among firms in the same sector, in different sectors and in different countries. Various scoring systems exist and, as explained below, they mainly differ on (1) measuring methods (scoring scale), (2) guidance or criteria measurement and (3) themes (Evangelinos et al., 2009).

- (1) Several scoring systems are based on guidelines and scoring criteria. Guidelines proposed by international organisations such as GRI, UNEP, ISO, Ernst & Ernst, KPMG, etc. are widely accepted to evaluate and score sustainability information (Evangelinos et al., 2009).
- (2) Scoring methods can also differ in the number of themes, i.e. indicators, they assess. These themes are either developed by scholars or borrowed from one of the previously named international organisations.
- (3) A scoring scale facilitates an assessment of the level of comprehensiveness of a topic by ranking it from being briefly mentioned to being fully documented (Morhardt et al., 2002). As showed in Table 9, a topic is assigned a score from range of points indicating how deeply it is covered in the SR.

Table 9 Overview of different scoring scales in the context of topic assessment in sustainability reports

Scoring scales	Found in:
0 to 4 0 - No information disclosed; 1 - General information disclosed; 2 - Incomplete information disclosed; 3 - Clear disclosure; 4 - Consistent, transparent and methodical disclosure ¹³ .	Evangelinos et al. (2009); Skouloudis et al. (2009); Skouloudis, Evangelinos, & Kourmoussis (2010); Skouloudis, Jones, Malesios, & Evangelinos (2014).
0 to 2 2 - Monetary or quantitative disclosure; 1 - Qualitative disclosure; 0 - Absence of disclosure on a topic ¹⁴ .	Huang & Kung (2010).
0 to 1 1 - Presence of the information; 0 - Absence of the information.	Jupe (2005); Lynch et al. (2014) ; Alazzani & Wan-Hussin (2013).

¹³ A similar approach can also be taken with a 0 to 3 scoring scale (e.g. Morhardt, Baird, & Freeman, 2002).

¹⁴ This approach has however been disregarded for the sake of the present study since there is an assumption that quantitative disclosure has more value than qualitative disclosure.

3.4.3 Questionnaires

Questionnaires and interviews are also used as a method to evaluate the sustainability information disclosed by organisations. However, according to Owen (2008), a slightly small body of study has engaged with organisations through questionnaires and interviews. There are several key examples of studies that use a questionnaire to obtain information. Wilmshurst & Frost (2000) conducted a mail survey of the chief financial officers of selected Australian companies in order to understand their motivations for sustainability disclosure. Dobbs et al. (2012) also used a questionnaire to ask New Zealand companies about their reporting practices and how they thought information should be disclosed. A third example of a study using a questionnaire, Manetti & Toccafondi (2014) investigated stakeholder engagement and participation in non-for profit organisations' SRs. While the studies previously mentioned used the questionnaire as a way to approach managers, other studies also address their questionnaire to stakeholders (e.g. Deegan). Two case studies illustrate the use of the interview method. The first, O Donovan (2002), utilised semi-structured interviews with managers from three large Australian companies in order to investigate the choice to disclose information, the reasoning behind this disclosure and the manager's perception of this choice. The second study is set in the Irish corporate context, where O'Dwyer (2002) also conducted semi-structured interviews with managers in order to understand their motivations for corporate social disclosure

3.5 Gap analysis

Aside from the academic framework and method developed to respond to scholastic need, another tool was used in order to better and more clearly present the findings of the study to the industry, i.e. the port sector.

3.5.1 Gap analysis existing usage

A gap analysis is a technique used in various fields to determine what steps need to be taken in order to move from a current situation to a desired or required targeted state. A gap analysis consists of three main stages: **(1)** analysing the current situation by listing the present characteristic factors - "*where are we now*", **(2)** determining the future targeted state - "*where do we want to be*" and **(3)** figuring out how to bridge the gap between these two states by providing recommendations (Nawrocka, 1997). As a tool to reach targeted objectives, gap analysis is commonly found in a company's project management methodologies. Examples of possible gap analysis perspectives are product, knowledge or process gaps. In the environmental management context, a gap analysis can assess companies' current EMS status, for example under ISO 14001 and EMAS (e.g. Nawrocka, 1997). Furthermore, companies also make use of this analysis tool to evaluate their SR system under the GRI Guidelines ("Sustainability Report Assurance (SRA)," n.d.)

3.5.2 Gap analysis applied to sustainability reporting

Since a gap analysis provides a broad outlook of a system in place, rather than detailed information from the activities deriving from it (Nawrocka, 1997), it looks like an useful tool for obtaining an overview of the SR situation within the port sector. However, even though the main ideas and structure of gap analysis persist, this tool is used slightly differently for the sake of this thesis. While a gap analysis commonly evaluates the performance of one single company, in this context, one port, this thesis takes a wider approach. Therefore, a gap analysis of each single port under analysis will not be provided, since the purpose here is not to give personal recommendations to each single port. Instead, an encompassing analysis of the port sector will be undertaken. The rationale behind this broader approach is directly linked to the thesis's research questions and purpose. Since this thesis aims to lay the foundations for more standardisation within port sustainability reporting as a sector, an encompassing analysis will be more useful than individual recommendations.

3.6 Own framework and methods developed from the literature review

Although the methodology information can be found in the first chapter (cf. Section 1.4), this section presents how the review of the literature has led to this thesis framework and methods.

With RQ1 in mind, “*What does ports’ environmental reporting look like within - or outside - the GRI Guidelines and what is the rationale behind ports’ environmental disclosure?*”, the following steps are followed:

- **Content analysis** (cf. Section 3.4.1) is used to assess and compare the SRs of ports;
- A binary **scoring method** was utilised (cf. Section 3.4.2), revealing the presence (1) or absence (0) of environmental topics, i.e. GRI indicators, in the SR under analysis¹⁵;
- To better grasp the rationale behind sustainability reporting and the choice of indicators disclosed in the port sector, a customizable **questionnaire** was developed for port publishing each SR under analysis. The questionnaires were developed based on the drivers for reporting (cf. Section 3.2) and take into account the criticism address to sustainability reporting (cf. Section 3.3). The questionnaires were complemented by both personal experience and informal discussions¹⁶;
- If availability and time allowed, a discussion over the phone was conducted to (1) clarify unclear areas and (2) discuss any other indicators disclosed.

Regarding RQ2, “*How can ports both improve and harmonise their sustainability reporting?*”, the following methods are deployed:

- To provide recommendation on sustainability reporting in general – not limited to environmental reporting –, a **meeting** with GRI was attended and **interviews** with GRI representatives were organised;
- In order to draw recommendations on how to improve environmental reporting more specifically, a set of KEPIs is proposed. From the questionnaires’ results, GRI environmental indicators are kept if identified as material for the port sector and rejected if not. Material indicators are those which are of significance for the organisation and which can influence the evaluation and decisions of stakeholders. From this, the **Stakeholder theory** is used to see whether ports disclose information to respond to their stakeholder’s concerns, or likewise, which would reveal the materiality of the indicator;
- The **Gap analysis** is then presented in the concluding chapter.

¹⁵ Even though a 4-0 (or 3-0) scale facilitates the assessment of the thoroughness of each indicator disclosed and would therefore have helped identify which indicators are reported with the most completeness, the choice of a binary scale (0-1) was made for the several reasons. Firstly, a high completeness rate for an indicator would not have necessarily reflected its materiality. Indeed, maybe ports all have –for a given reason- easy access to information on a certain indicator that is not material to the sector. Secondly, identification of the most frequent indicators is still possible with a binary scoring, and thirdly, direct contact with people involved in creating the SR provided further information about the indicators anyway.

¹⁶ An example of questionnaire can be found in Annex 1.

4 Findings

This chapter contains two main sections; one pertaining to the port sector (content analysis of SR, questionnaires and follow-up interviews) and the other to GRI (meeting and interviews).

4.1 Results obtained from questionnaires and interviews with ports

In this first section, the findings are subdivided into the three categories of ports: (1) ports reporting in accordance with GRI, (2) ports that are not reporting with GRI and (3) ports that are not reporting at all. Readers not familiar with the GRI environmental indicators are advised to keep the GRI table on hand (cf. Section 2.1.3, Table 5).

4.1.1 Category 1: Ports reporting in accordance with GRI

As mentioned in the introductory chapter, 13 ports currently reporting on sustainability performance in accordance with the GRI Guidelines have been identified. More detailed information on these 13 ports can be found in Annex 3. In line with the scope of this study, the GRI environmental performance indicators (EN) of each of these 13 reports have been identified and their presence (1) or absence (0) is represented in Table 10. Since most of these ports (10 out of the 13) report in accordance with the G3 version (both G3.0 and G3.1)¹⁷, Table 10 aligns with the G3 version. The results of the other ports already using the G4 version (3 out of the 10), were accordingly transposed to the G3 version¹⁸.

Table 10 Overview of the GRI environmental indicators (EN) that are reported (1) or omitted (0) amongst the 13 ports identified as reporting in accordance with the GRI Guidelines

		Antwerp	Rotterdam	La Coruna	Stockholm	Vancouver	Santa Marta	Transnet	Los Angeles	Ferrol	Dubai	Sines	Bremen	Tianjin	SCORE	SCORE max	%
Material	EN1	0	0	1	0	0	0	0	0	1	0	0	1	1	4	13	31
	EN2	0	0	1	0	0	0	0	0	1	0	0	0	0	2	13	15
Energy	EN3	1	0	1	1	1	1	1	1	1	0	0	1	1	10	13	77
	EN4	0	0	1	1	1	1	0	0	1	1	0	1	1	8	13	62
	EN5	0	1	1	0	1	0	0	0	1	1	0	0	1	6	13	46
	EN6	0	1	0	0	1	1	0	0	0	1	0	1	1	6	13	46
	EN7	0	1	0	0	1	1	0	0	0	1	0	1	1	6	13	46
Water	EN8	1	0	1	1	0	1	0	0	1	1	0	1	1	8	13	62
	EN9	1	0	1	0	0	0	0	0	1	1	0	0	0	4	13	31
	EN10	1	0	1	0	0	1	0	0	1	0	0	0	1	5	13	38
Biodiversity	EN11	1	1	1	0	0	1	0	0	1	0	0	1	0	6	13	46
	EN12	0	1	1	0	0	1	0	0	1	0	0	1	0	5	13	38
	EN13	1	1	1	0	0	0	0	1	1	0	0	1	0	6	13	46
	EN14	0	1	1	0	0	0	0	1	1	0	0	0	0	4	13	31
	EN15	1	0	1	0	0	0	0	0	1	0	0	0	0	3	13	23
Emissions, effluents, and waste	EN16	1	1	1	1	1	1	1	1	1	1	0	1	0	11	13	85
	EN17	0	1	0	1	1	1	1	0	1	1	0	1	0	8	13	62
	EN18	0	1	1	0	1	1	0	1	1	1	0	1	1	9	13	69
	EN19	0	0	1	0	0	0	0	0	1	0	0	0	0	2	13	15
	EN20	1	0	0	1	1	1	0	1	1	0	0	1	0	7	13	54
	EN21	1	0	1	1	0	0	0	0	1	0	1	1	0	6	13	46
	EN22	1	0	1	1	1	1	0	0	1	1	1	1	1	10	13	77
	EN23	1	1	1	0	0	0	0	0	1	0	1	0	0	5	13	38
	EN24	0	0	1	0	0	0	0	0	1	0	1	0	0	3	13	23
EN25	1	1	1	0	0	0	0	0	1	0	1	0	0	5	13	38	
Products and Services	EN26	0	1	1	0	1	0	0	0	1	1	1	1	1	8	13	62
	EN27	0	0	0	0	0	0	0	0	0	0	1	0	0	1	13	8
Compliance	EN28	0	1	1	0	1	1	0	0	1	1	0	0	0	6	13	46
Transport	EN29	0	1	1	0	0	0	0	0	0	0	1	0	0	3	13	23
Overall	EN30	0	1	1	0	0	0	0	0	1	1	1	1	0	6	13	46
	SCORE	13	16	25	8	12	14	3	6	26	13	9	17	11			

¹⁷ As stated in the introductory chapter, the present study does not differentiate between G3.0 and G3.1 (cf. Chapter 1).

¹⁸ It should be noted however that the horizontal score line providing the GRI environmental reporting score of each port is therefore not adequate and does not reflect the exact reality of the three ports reporting with G4. For Transnet Ports Authorities and Sines Port, the transposed results can be seen as similar to the initial ones, since the indicators these ports report are present in both G3 and G4 (although the indicators' numbers are different). The situation is different for the port of Antwerp, as some indicators, not found in G3 but present in G4, are reported by the Port but are not included in the Table 10. Nonetheless, the score line that is interesting in the context of this study is the vertical one, i.e. the popularity of each indicator, since the purpose of this thesis is to identify the significant KEPI. The decision was therefore made to align all the results in one table in order to obtain an overview of the situation

The table output that is of utmost interest is not each port's individual score (horizontal axe), rather it is the score obtained by each indicator (vertical axe). Each indicator has been used at least once (out of the 13 possible times) and no indicator has reached a higher score than 11 (again, out of the 13 possible times). Table 11 presents the three levels of indicator frequency which were drawn out of these results.

Table 11 Levels of frequency of the GRI environmental indicators obtained from the scoring method

Levels of frequency	GRI environmental indicators
Low [0-5] Reported in less than 40%	EN1, EN2, EN9, EN10, EN12, EN14, EN15, EN19, EN23, EN24, EN 25, EN27, EN29
Medium [6-9] Reported between 50 to 62%	EN4, EN5, EN6, EN7, EN8, EN11, EN13, EN17, EN18, EN20, EN21, EN26, EN28, EN30
High [10-13] Reported in at least 77%	EN3, EN16, EN22.

The reporting rates of each aspect category are represented in Figure 2¹⁹.

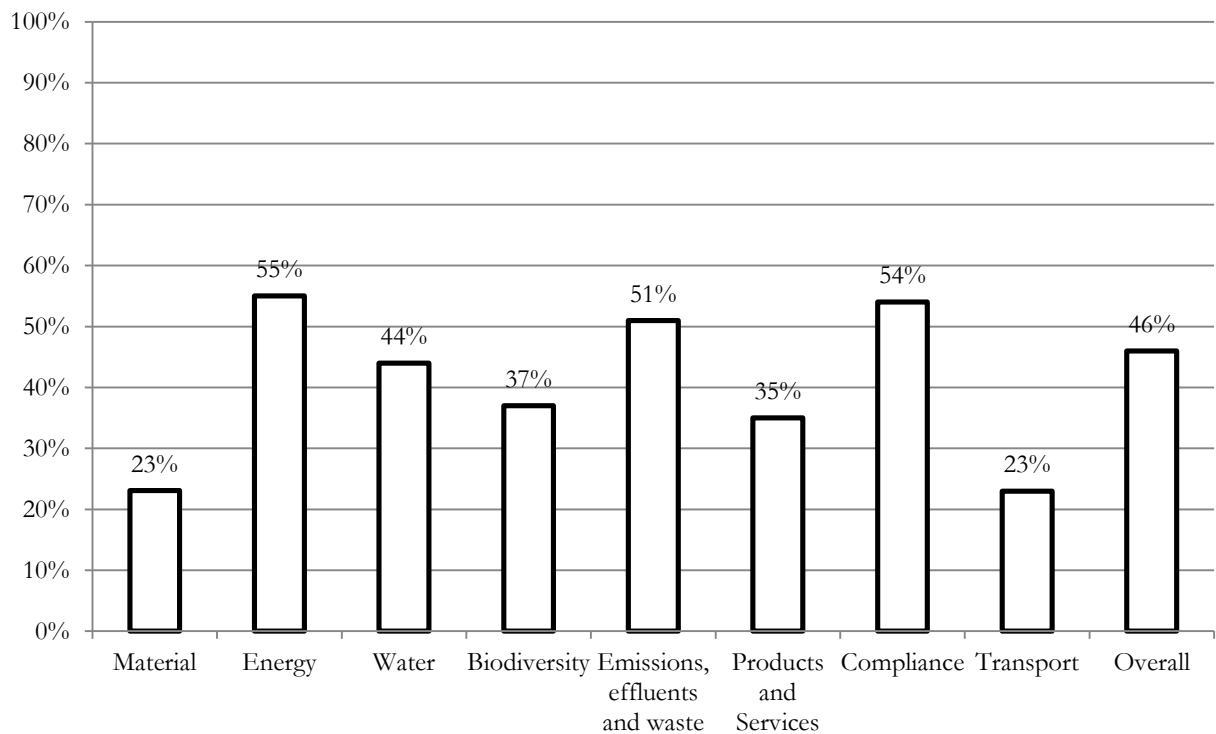


Figure 2 Reporting rates obtained from the scoring method of each GRI environmental aspects amongst the 13 ports identified as reporting in accordance with GRI.

With the table overview in mind, 6 out of the 13 ports reporting in accordance with GRI were contacted to further develop the analysis of the environmental indicators disclosed. The following sections present the results obtained for each of the 6 ports individually. Each port's disclosure of environmental indicators as well as its omission of popular indicators was dis-

¹⁹ One should note however, that the last three aspects only contain one indicator.

cussed through questionnaires and interviews based on the hypotheses developed for this purpose (cf. Chapter 1). When a table is proposed to help visualise the findings, it only presents the indicators disclosed by the analysed port, i.e. not the omitted ones. Also, a cross in the table means a positive answer to the questionnaire answer possibilities.

Port of Antwerp

The Port of Antwerp published its second SR for the year 2012 based on the newest GRI Guidelines, G4. The report is externally verified. The outcome of the questionnaire designed on the environmental indicators disclosed by the Port of Antwerp is presented in Table 12.

Table 12 Results obtained from the questionnaire addressed to the Port of Antwerp regarding the reasons for disclosing each GRI environmental indicator

	EN3	EN5	EN8	EN9	EN10	EN11	EN13	EN14	EN15	EN16	EN18	EN21	EN22	EN23	EN24	EN26	EN34
To greet the port of Antwerp's unique situation																	
To emphasize an area where the port of Antwerp performs particularly well						x	x	x						x			
To meet legal obligations and/or preempt legally imposed requirements						x	x	x						x		x	
To meet the requirements of GRI	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
To satisfy "due diligence" requirements					x												
To respond to stakeholder concerns	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Due to competitor response to environmental issues																	
Due to an easy access to data regarding this indicator																	
To provide managers with an overview and understanding of the performance over time	x	x						x	x	x	x	x	x	x	x		
To provide managers with data for analyses of risks and opportunities		x	x						x	x					x		
To provide managers with data allowing benchmarking with other ports		x									x			x			
Other	x	x	x		x							x	x				

For the section "to respond to stakeholder concerns", the port of Antwerp was provided the possibility of specifying which stakeholders. For indicators EN3, EN5 (aspect Energy), EN8, EN9 and EN10 (aspect Water), the following were specified: a mixture of stakeholders representing the port community, the surrounding municipalities and environmental NGOs. In the "Other" section, the Port of Antwerp gave additional reasons for reporting on a number of indicators. EN3 and EN5 were disclosed, not just for the other reasons checked on the questionnaire, but also to facilitate discussion and to enhance measures to reduce, respectively, energy consumption and energy intensity. Similarly, the following indicators also had "other" reasons: EN8 to create awareness regarding sustainable (re-)use of water, EN10 to enhance the (re-)use of rainwater, EN21 (aspect Emission) to evaluate a joint program of measures taken by regional and local authorities and the port authority to deal with fine dust, EN22 (aspect Effluents and wastes) to be able to determine relevant sources and to implement adequate measures and EN34 (aspect Environmental grievance) to increase public 'appreciation'.

In addition, the reasons why the Port of Antwerp does not report on indicators EN27 (extent of impact mitigation of environmental impacts of products and services) and EN4 (energy consumption outside of the organisation), which have been identified as frequently reported popular indicators, were also investigated. EN27 was not reported for three main reasons: (1) the port directs products and services to more than 900 companies, which makes it difficult to provide the full picture, (2) it is difficult to assess and define what "products and services" corresponded to for a whole port area, and (3) the port community level is too complex to be

estimated. EN4 was not reported for a similar reason: port community level is too complex to be estimated and it is also almost impossible to set the boundaries.

The Port of Antwerp has also added five indicators not covered by G4:

- (1) **G3-EN6**: “Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives”. It is an indicator present under G3 but was removed during the development of G4. The Port of Antwerp disclosed this indicator (1) to respond to stakeholder concerns and (2) to provide managers with an overview and understanding of the performance over time. Furthermore, energy management should be enhanced by the use of renewable energy sources, not just by reduction of energy consumption. Mapping this as an indicator raises awareness and prompts players in the port to act.
- (2) **Air quality**: the concentration of SO₂, NO_x and PM10, as well as the number of days where the PM10 concentration exceeds the norm limit, are disclosed as an indicator at the Port of Antwerp. This indicator is closely related to G4- EN21 (or G3-EN20): NO_x, SO_x, and other significant air emissions. However, while the later indicator concerns the emission, air quality refers to the concentration. The air quality indicator should ideally be linked to the emitter, and therefore to EN20. According to the questionnaire, the reasons why the Port of Antwerp decided to report on air quality are the following: (1) to respond to stakeholder concerns, (2) to provide managers with an overview and understanding of the performance over time, (3) to provide managers with data for analyses of risks and opportunities and (4) to be able to evaluate and initiate adequate measures that help to improve the environment and to reduce the impact of pollution on people living and working in and around in the port.
- (3) **Sediment quality**: various types of legacy pollution – such as most metals and PAHs- can be found in water bottom sediment. The identification and the concentration of these types of pollution are measured at the Port of Antwerp. The Port of Antwerp reports on sediment quality for the following reasons: (1) to meet legal obligations and/or pre-empt legally imposed requirements, (2) to respond to stakeholder concerns, (3) to provide managers with an overview and understanding of the performance over time and (4) to provide managers with data for analyses of risks and opportunities.
- (4) **Soil quality**: condition of soil based on soil sanitation investigation status. The Port of Antwerp reports on soil quality for the following reasons: (1) to meet legal obligations and/or pre-empt legally imposed requirements, (2) to respond to stakeholder concerns, (3) to provide managers with an overview and understanding of the performance over time and (4) to provide managers with data for analyses of risks and opportunities²⁰.
- (5) **ESI**: Environmental Ship Index (cf. Section 2.2)

²⁰ One should note that these indicators are relevant if the boundaries of the SR are set to the whole port area, rather than simply to the port authority

Port of Rotterdam

Sustainability reporting at the Port of Rotterdam has been done annually for 6 years as part of the port's authority's annual report. The latest to date, "Jaarverslag 2013" covers the year 2013 and follows the G3.1 guidelines and is externally verified. The outcome of the questionnaire designed on the GRI G3.1 environmental indicators disclosed by the Port of Rotterdam is presented in Table 13.

Table 13 Results obtained from the questionnaire addressed to the Port of Rotterdam regarding the reasons for disclosing each GRI environmental indicator

	EN5	EN6	EN7	EN11	EN12	EN13	EN14	EN16	EN17	EN18	EN23	EN25	EN26	EN28	EN29	EN30
To greet the port of Rotterdam's unique situation																
To emphasize an area where the port of Rotterdam performs particularly well										x						
To meet legal obligations and/or pre-empt legally imposed requirements																
To meet the requirements of GRI																
To satisfy "due diligence" requirements																
To respond to stakeholder concerns		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Due to competitor response to environmental issues				x				x								
Due to an easy access to data regarding this indicator																
To provide managers with an overview and understanding of the performance over time	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
To provide managers with data for analyses of risks and opportunities																
To provide managers with data allowing benchmarking with other ports																
Other	x															

When the section "To respond to stakeholder concerns" was checked, community and shareholders were mentioned as important stakeholders for each indicator. For some indicators however, certain stakeholders, particular to each indicator, were mentioned. For example, EN6 and EN7 (aspect Energy) also aim to respond to customers' concerns, EN11, EN12, EN13 and EN14 (aspect Biodiversity) to environmental lobby groups' concerns, and EN16, EN17, EN18, EN23, EN25 (Aspect Emission, effluents and waste) EN28, EN29 and EN30 (aspect Compliance, Transport and Overall) to both environmental lobby groups' and customers' concerns. The "Other" section box was only checked for EN5, Energy saved due to conservation and efficiency improvements. The justification provided was the following: "our own energy consumption is not a material topic in the port, but we must 'practice what we preach'".

As for the identified popular indicators, the port of Rotterdam does not report on two of them, i.e. EN3 and EN4, respectively direct and indirect energy consumption by primary energy source. For both of them, the reason for not reporting is twofold: there is no demand from inside to report on these indicators and it is also too time-consuming. Furthermore, environmental topics not covered by GRI environmental indicators were identified in the Port of Rotterdam's annual report: Discounted harbour due rates for air emission (ESI) and waste, Environmental Impact Assessment (EIA), Rotterdam Climate Initiative (a partnership to reduce CO₂ in Rotterdam), Soil remediation (through the disclosure of allowances for future clean soil), and Bunkering and water pollution. In addition, the Port of Rotterdam created its own list of Key Performance Indicators (KPIs). The environmental-related indicators from that list are the following: efficient and (sustainable) transport (including the Nautical Efficien-

cy Index²¹, modal split²², liquefied natural gas (LNG) terminal, degassing of barges), Safety (the Safety and Environmental Index (NSI)²³ and Port Authority’s footprint.

Port of Ferrol

The Port of Ferrol has reported in accordance with GRI since 2010 and the latest report covers the year 2012. The report is not externally verified. The outcome of the questionnaire designed on the GRI G3.1 environmental indicators disclosed by the Port of Ferrol is presented in Table 14.

Table 14 Results obtained from the questionnaire addressed to the Port of Ferrol regarding the reasons for disclosing each GRI environmental indicator

	EN1	EN2	EN3	EN4	EN5	EN8	EN9	EN10	EN11	EN12	EN13	EN14	EN15	EN16	EN17	EN18	EN19	EN20	EN21	EN22	EN23	EN24	EN25	EN26	EN28	EN30	
To greet the port of Ferrol's unique situation																											
To emphasize an area where the port of Ferrol performs particularly well																											
To meet legal obligations and/or pre-empt legally imposed requirements	x								x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	
To meet the requirements of GRI	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
To satisfy "due diligence" requirements																											
To respond to stakeholder concerns	x	x			x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x		x
response to environmental issues data regarding this indicator																											
To provide managers with an overview and understanding of the performance over time	x		x		x	x											x		x	x	x	x		x		x	
To provide managers with data for analyses of risks and opportunities	x		x		x	x								x	x	x	x		x	x	x	x		x		x	
data allowing benchmarking with other ports																							x				
Other	x		x			x								x		x			x	x	x	x		x			

When the section “To respond to stakeholder concerns”, was checked, the stakeholder “community” was mentioned as the one to which the Port of Ferrol wants to respond. An “other” reason was provided for reporting on EN1, EN13, EN8, EN16, EN18, EN21, EN22, EN23 and EN24; they are some of the environmental aspects included in the Port of Ferrol’s Environmental Management System (ISO 14001), which the port must check every year in order to control and manage.

The Port of Ferrol reports on all the identified popular indicators. There are only four environmental GRI indicators missing: EN6, EN7, EN27 and EN29. The two main reasons why the Port of Ferrol does not report on these indicators are as follows: they are not material to the port (the port authority does not manufacture anything) and the port has nothing to report on these topics. Other topics that are not covered by the GRI Guidelines are also disclosed by the Port of Ferrol. Most of them are the indicators proposed by Ports of the State in the Spanish port system (cf. Chapter 2).

²¹ This index assigns a rating of the degree to which the shipping is handled in accordance with the planning schedule.

²² It provides information on the proportion of containers transported by road, water and rail.

²³ This index measures the level of compliance with rules on safety and the environment on board ships.

Port of Sines

For 2013, the Port of Sines published “Relatório de Sustentabilidade 2013”, its first report based on the G4 version of the GRI. The Port of Sines, however, has annually reported on sustainability performance since 2009. While under G3.0 the Port of Sines reported on all of the 30 environmental indicators, under G4 it now reports on 9 out of the 34. The outcome of the questionnaire designed on the GRI G4 environmental indicators disclosed by the Port of Sines is presented in Table 15.

Table 15 Results obtained from the questionnaire addressed to the Port of Sines regarding the reasons for disclosing each GRI environmental indicator

	EN22	EN23	EN24	EN25	EN26	EN27	EN28	EN30	EN31
To greet the port of Sines's unique situation									
To emphasize an area where the port of Sines performs particularly well									
To meet legal obligations and/or pre-empt legally imposed requirements									
To meet the requirements of GRI	x	x	x	x	x	x	x	x	x
To satisfy “due diligence” requirements									
To respond to stakeholder concerns									
Due to competitor response to environmental issues									
Due to an easy access to data regarding this indicator									
To provide managers with an overview and understanding of the performance over time									
To provide managers with data for analyses of risks and opportunities									
To provide managers with data allowing benchmarking with other ports									
Other	x	x	x	x	x	x	x	x	x

For the “Other” section, additional reasons for reporting on these indicators were provided. The Port of Sines gave the same justification for all the indicators disclosed: “it is considered as a material aspect by the internal stakeholders”. As for not reported GRI indicators, the SR explains that these indicators are only omitted due to their non-materiality. The questionnaire asked more particularly why some of the identified popular indicators, i.e. EN3 and EN16, were not reported. The Port of Sines reported on these indicators under G3.1, however under G4, they nowadays (under G4) currently only report on indicators considered to be material to stakeholders. No indicators not covered by GRI were disclosed, since the Port of Sines strictly follows the GRI design.

Port of Los Angeles

The latest SR of the Port of Los Angeles covers the period July 2011-June 2013. It is the first SR designed in accordance with the GRI Guidelines, but the report is not externally verified. The outcome of the questionnaire designed on the GRI G3.1 environmental indicators disclosed by the Port of Los Angeles is presented in Table 16.

Table 16 Results obtained from the questionnaire addressed to the Port of Los Angeles regarding the reasons for disclosing each GRI environmental indicator

	EN3	EN13	EN14	EN16	EN18	EN20
To greet the port of Los Angeles' unique situation	x	x	x	x	x	x
To emphasize an area where the port of Los Angeles performs particularly well	x	x	x	x	x	x
To meet legal obligations and/or preempt legally imposed requirements	x	x	x	x	x	x
To meet the requirements of GRI	x	x	x	x	x	x
To satisfy "due diligence" requirements						
To respond to stakeholder concerns	x	x	x	x	x	x
Due to competitor response to environmental issues						
Due to an easy access to data regarding this indicator					x	x
To provide managers with an overview and understanding of the performance over time	x	x	x	x	x	x
To provide managers with data for analyses of risks and opportunities	x	x	x	x	x	x
To provide managers with data allowing benchmarking with other ports	x	x	x	x	x	x
Other						

When the Port of Los Angeles was given the possibility of specifying for the section "to respond to stakeholder concerns", the following answers were provided. For EN3 (aspect Energy), the stakeholders of highest interest are NGOs and to some extent suppliers, i.e. energy providers. The disclosure of indicators EN13 and EN14 (aspect Biodiversity) is oriented towards resource agencies, national marine fisheries, local NGOs and environment groups. EN16, EN18 and EN20 (aspect Emissions, effluents and waste) are reported to respond to the concerns of air agencies and environmental justice groups, but also more generally to the whole society. Air quality is a big issue in the United States, and these three indicators are covered under the Clean Air Action Plan, which is addressed to many people, from government officials to community members. Air quality concern in the United States is also a reason why, for example, the section "to greet the port of Los Angeles' unique situation" was checked.

The non-disclosure of certain GRI indicators was justified differently according to the indicator. Firstly, there is no demand from inside to report on EN4, Indirect energy consumption by primary source, and the port also could not find any examples. However, the Port of Los Angeles will take a deeper look at this indicator in the future. Secondly, it was a management decision not to report on EN22, Total weight of waste by type and disposal method, due to an overload of information. In addition, EN22 covers an area that is already heavily regulated in the United States. Thirdly, the Port of Los Angeles has nothing to report on EN26, Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation, since this indicator specifies products and services and therefore the Port of Los Angeles believed that this indicator does not apply to their operations as landlord port, leasing property to tenants who, in turn, operate their own facilities. Other additional topics not covered by the GRI Guidelines were highlighted: EMS, Discount on harbor due rate (e.g. ESI) and sediment movement and quality.

Port Metro Vancouver

The outcome of the questionnaire designed on the GRI G3.1 environmental indicators disclosed by the Port of Metro Vancouver in its fourth annual SR, 2013 Sustainability Report, is presented in Table 17. The report is externally verified.

Table 17 Results obtained from the questionnaire addressed to the Port Metro Vancouver regarding the reasons for disclosing each GRI environmental indicator

	EN3	EN4	EN5	EN6	EN7	EN16	EN17	EN18	EN20	EN22	EN26	EN28
To respond to Port Metro Vancouver's unique situation	x	x	x	x	x	x	x	x	x	x	x	x
To emphasize an area where Port Metro Vancouver performs particularly well												
To meet legal obligations and/or pre-empt legally imposed requirements												
To meet the requirements of GRI	x	x	x	x	x	x	x	x	x	x	x	x
To satisfy "due diligence" requirements	x	x	x	x	x	x	x	x	x	x	x	x
To respond to stakeholder concerns	x	x	x	x	x	x	x	x	x	x	x	x
Due to competitor response to environmental issues												
Due to an easy access to data regarding this indicator												
To provide managers with an overview and understanding of the performance over time	x	x	x	x	x	x	x	x	x	x	x	
To provide managers with data for analyses of risks and opportunities												
To provide managers with data allowing benchmarking with other ports											x	
Other	x	x	x	x	x	x	x	x	x	x	x	

Port Metro Vancouver points out that there is a lot of stakeholder pressure from the community, activists and NGOs, especially regarding the port's contribution to climate change. For example, stakeholders carefully follow issues surrounding coal and any impact on the sea that affects mammals living in the region. A monitoring program in place for killer whales exemplifies the community's interest in the port's impacts, and is really particular to the region²⁴. As a result of this pressure, the section "to respond to Port Metro Vancouver's unique situation" is checked for all indicators. When the section "Other" was checked, two main additional reasons for reporting on these specific GRI indicators were provided: significance to the organisation and significance to stakeholders. At Port Metro Vancouver, they have used the GRI Technical Guidance on Materiality and have convened stakeholder workshops to conduct a materiality test and inform indicator selection. Consequently, the main reason why some GRI indicators were not reported by Port Metro Vancouver is their non-materiality. According to the reasoning of the questionnaire, it was therefore a decision management not to report on them. In addition, Port Metro Vancouver was sometimes not in a position to report the data, i.e. they did not currently have adequate expertise or resources.

Other additional topics not fully covered by the GRI Guidelines were identified in the 2013 SR of Port Metro Vancouver, such as dust and noise from port operations, discounted harbour due rates, dredging monitoring (number of times dredging operation ceased due to mammal sightings) and awards for vessels cutting their emissions and air quality (i.e. concen-

²⁴ Even if out of the scope of the present thesis, arboriginal people living near Port Metro Vancouver also represent, on the social indicator side, a unique characteristic specific to the region.

tration). Furthermore, the Port Metro Vancouver considers two main types of indicators to be missing from the GRI Guidelines: (1) indicators pertaining to stakeholder and community consultation and engagement, (2) indicators pertaining to the performance of major infrastructure projects (R. Chester, personal communication, August 7, 2014)²⁵.

4.1.2 Category 2: Ports not reporting in accordance with GRI

The same structure is kept to present the findings of category 2. The most reported aspects in this category of port are waste, energy and transport. To a lesser extent, biodiversity, emissions and air quality are also frequently mentioned.

Groningen Seaports

Groningen Seaports is part of EemsdeltaGreen, which is a platform elaborated in 2011 that gathers together various companies working for the sustainable development of the region they are in, i.e. Eemsdelta. Since the online SR provided by EemsdeltaGreen is under construction and is mainly a collection of ongoing green projects in the region, the questionnaire was based on an older SR developed by Groningen Seaports itself, Duurzaamheidsjaarverslag 2010. The outcome of this questionnaire is presented in Table 18.

Table 18 Results obtained from the questionnaire addressed to Groningen Seaports regarding the reasons for disclosing each environmental indicator

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
To greet Groningen Seaports' unique situation		x	x					x	x		x	x	x	x	x	
To emphasize an area where Groningen Seaports performs particularly well	x			x						x						
To meet legal obligations and/or pre-empt legally imposed requirements						x										
To satisfy "due diligence" requirements																
To respond to stakeholder concerns																x
Due to competitor response to environmental issues																
Due to an easy access to data regarding this indicator																
To provide managers with an overview and understanding of the performance over time							x									
To provide managers with data for analyses of risks and opportunities																
To provide managers with data allowing benchmarking with other ports								x								
Other																

Legend: 1: Waste from ships; 2: biodiversity; 3: Vegetation monitoring results; 4: Eco-friendly green management; 5: Nature compensation Area; 6: Environmental Survey; 7: Air quality; 8: Industrial Ecology; 9: Emission from ships; 10: own footprint; 11: (Cooling and waste) water; 12: Renewable energy; 13: Waste-to-energy plant; 14: Sustainable lighting; 15: Green power/ electricity; 16: Environmental complaints

When the section "to respond to stakeholder concerns" was chosen for topic 16, Groningen Seaport specified that this topic is mainly reported for the community. No "other" reasons for reporting on any of these topics were provided. As for why the GRI Guidelines have not been used, the fact is that there is no demand from outside to report in accordance with the GRI Guidelines. This situation might change if their stakeholders demand a GRI report.

²⁵ On a side note, as of 6 June 2014, Port Metro Vancouver is taking part in the IIRC Pilot Programme Business Network (cf. Chapter 2 for background information on IR) (IIRC, 2014a).

Valencia Port

Valencia Port has reported on environmental matters since 2006. For the sake of this study, the latest Annual Environmental Report publicised in 2012 by the Port Authority of Valencia, was analysed. The outcome of the questionnaire designed on the environmental topics disclosed by Valencia Port is presented in Table 19.

Table 19 Results obtained from the questionnaire addressed to Valencia Port regarding the reasons for disclosing each environmental indicator

	1	2	3	4	5	6	7	8	9	10	11	12	13
To greet Valencia Port's unique situation													
To emphasize an area where Valencia Port performs particularly well													
To meet legal obligations and/or pre-empt legally imposed requirements				x	x	x	x	x	x	x	x	x	x
To meet the requirements of GRI or EMAS	x	x	x	x	x	x	x	x	x	x	x	x	
To satisfy "due diligence" requirements													
To respond to stakeholder concerns	x	x	x	x	x	x	x	x	x	x	x	x	x
Due to competitor response to environmental issues													
Due to an easy access to data regarding this indicator													
To provide managers with an overview and understanding of the performance over time													
To provide managers with data for analyses of risks and opportunities													
To provide managers with data allowing benchmarking with other ports													
Other													

Legend: 1: Total number and volume of the most significant accidental spills; 2: Initiatives for mitigating environmental impacts from PA operations; 3: Cost of significant financial penalties and number of non-monetary sanctions for the non-fulfilment of environmental legislation; 4: Electricity consumption; 5: Water consumption; 6: Fuel Consumption; 7: Biodiversity; 8: Paper; 9: Hazardous waste; 10: non-hazardous waste; 11: CO2 Equivalent emissions direct; 12: CO2 Equivalent emissions (indirect); 13: Puertos del Estado indicators

Since 2011, reporting is structured around three groups of indicators. The first group originates from the GRI methodology and was adapted to the characteristics of ports operations as defined within the MESOSPORT project (in Table 19, see topics 1, 2 and 3). For example, topic 2, initiative for mitigating environmental impacts from port authority operations, comes from EN26 (G3), but excludes the focus on products and services found in EN26. Reporting on this first batch of topics is not really a must for Valencia Port, which is currently deciding whether to delete them and report on specific indicators suitable for Spanish ports. The second group encompasses the indicators stipulated in EMAS II (topics 4 to 12 in the table), and reporting on these indicators is seen as a must. The third group comprises topics developed jointly with *Puertos del Estado*, Ports of the State (topic 13). As previously explained (cf. Chapter 2), these topics, i.e. indicators, are agreed on by the whole Spanish port system based on Spanish port law, and their inclusion in every Spanish port's business plan is mandatory. However, when it comes to environmental reports, the disclosure of these topics is voluntary. Valencia Port does not see this batch of indicators as the best tool for communicating environmental matters. These indicators are modified and improved each year, which makes comparing different years difficult. Valencia Port therefore includes them in the annex of their environment report, but considers the second group of topics, based on EMAS II, to be the most relevant framework. The stakeholders for nearly all of the indicators are the following: port community, shareholders and the city (neighbours).

As for Valencia Port's opinion on the GRI Guidelines, the port's staff believes that GRI is a good baseline but represents a very industrial landscape that is not really characteristic of port activity. Still, Valencia Port did use some of the GRI indicators that it thought were relevant.

Port of Ghent

The Environmental Report 2013 of the Ghent Port Company is the first separate report devoted exclusively to environmental matters. The framework used to guide the report is the PERS environmental management system (cf. Chapter 2). The outcome of the questionnaire designed based on the Environmental Report 2013 is presented in Table 20.

Table 20 Results obtained from the questionnaire addressed to the Port of Ghent regarding the reasons for disclosing each environmental indicator

	1	2	3	4	5	6	7	8	9	10
To greet the Port of Ghent's unique situation			x	x						x
To emphasize an area where the Port of Ghent performs particularly well		x	x				x			
To meet legal obligations and/or pre-empt legally imposed requirements	x				x			x	x	x
To meet the requirements of PERS	x	x	x	x	x	x	x	x	x	x
To satisfy "due diligence" requirements										
To respond to stakeholder concerns	x		x	x	x	x	x			x
Due to competitor response to environmental issues										
Due to an easy access to data regarding this indicator										
To provide managers with an overview and understanding of the performance over time		x	x	x	x	x		x	x	x
To provide managers with data for analyses of risks and opportunities						x				
To provide managers with data allowing benchmarking with other ports			x	x	x	x	x	x	x	
Other										

Legend: 1: Contaminated sites; 2: Infrastructure management; 3: Port development; 4: Mobility and logistical organisation; 5: Waste; 6: Calamities/Bunkering/Hazardous Substances; 7: Relations with local communities/CSR; 8: Water quality; 9: Air quality; 10: Development of natural areas;

The Port of Ghent responds to the concerns of different stakeholders with different topics. Topics 3, 5 and 7 mainly respond to community and shareholder concerns, while topics 1, 4, 6, 10 are addressed to a wider variety of stakeholders, such as the community, shareholders and environmental lobby groups- topic 1 is even addressed to customers.

There are several reasons why the port of Ghent is not using the GRI Guidelines: there is no demand from outside the port authority to report in accordance with this particular framework, there is currently no adequate expertise and resources to fulfil the requirements of the GRI Guidelines, and it is also too time-consuming to report in this way. The Port of Ghent is relatively small in comparison to many other ports and their staff and resources focused on sustainability and reporting are consequently quite limited. The idea was therefore to keep the reporting process simple. Based on discussions with other ports, the Port of Ghent determined that the GRI Guidelines did not seem to be easy to implement. Therefore, since the PERS certification makes it mandatory to provide an environmental report, the Port of Ghent decided to make this report available online. In addition, since the Port of Ghent is member of EcoPorts and of the ESPO-sustainable development committee, it prefers to use the specifically developed tool of the PERS as the main framework. The Port of Ghent will keep the PERS as a framework for the next few years, but has not ruled out the possibility of considering other framework, such as GRI.

Port of Gothenburg

The Port of Gothenburg has been annually reporting on sustainability since 2012. Two reports have been published so far, and the latest one, the Report of Gothenburg Port Authority 2013, is analysed here. The outcome of the questionnaire designed on the environmental topics disclosed by the Port of Gothenburg in its 2013 SR is presented in Table 21.

Table 21 Results obtained from the questionnaire addressed to the Port of Gothenburg regarding the reasons for disclosing each environmental indicator

	1	2	3	4	5	6	7	8
To greet the port of Gothenburg's unique situation								
To emphasize an area where the port of Gothenburg performs particularly well		x	x	x	x			
To meet legal obligations and/or pre-empt legally imposed requirements								
To satisfy "due diligence" requirements								
To respond to stakeholder concerns	x	x	x	x	x	x	x	x
Due to competitor response to environmental issues								
Due to an easy access to data regarding this indicator								
To provide managers with an overview and understanding of the performance over time								
To provide managers with data for analyses of risks and opportunities								
To provide managers with data allowing benchmarking with other ports								
Other	x	x	x	x	x	x	x	

Legend: 1: Initiatives towards being a climate neutral company; 2: Rail transport investment; 3: Onshore power supply; 4: LNG Terminal; 5: Environmental campaign on cleaner fuel; 6: Energy Port Environment Award; 7: Award for best dissertation on the theme of sustainable freight; 8: dredged spoils management

The Port of Gothenburg approaches their environmental responsibility from three main perspectives: carbon footprint minimization (topic 1), environmental smart transport development (topics 2, 3, 4, 5, 6 and 7) and port shipping's local impact reduction (topic 8). The Port of Gothenburg specified the stakeholders and explained "Other" reasons for each topic reported. Topic 1 is addressed to employees of the port, the CEO, customers and clients, the local environmental authority and the owner of the port (the city of Gothenburg), but also to the people on the national and international levels with whom the port collaborates in order to achieve its goal of being a climate neutral company. Consequently, the "Other" reason for reporting on this topic is to communicate the port's commitment. In addition, this topic can provide an overview of how to meet existing needs and support goals on the local, regional and national levels. Topics 2, 3, 4 and 5 are mainly addressed to the port community, closer customers and local and environmental authorities. These topics reflect areas where the Port of Gothenburg performs particularly well. The port is therefore willing to communicate information about these areas due to the satisfactory outcome it gets out of these investments. Another reason for reporting on these topics is to share these positive experiences and inspire other ports to follow the same path. For example, reporting on Topic 4 enables the Port of Gothenburg to clearly state that they are committed to supply LNG. Additionally, the Port of Gothenburg hopes other shipping companies will consider the LNG investment option after seeing the SR. Similarly, with Topic 5, the environmental campaign led by the Port of Gothenburg is communicated in order to provide a good example to the port community. Topics 6 and 7 are mainly communicated for those who received the award. These two topics are more of a side note compared to the other topics. Finally, Topic 8 addresses stakeholder concerns mainly at a local level, i.e. the community and environmental lobby groups.

General notes on all these topics were provided by the Port of Gothenburg. When the section “to emphasize an area where the Port of Gothenburg performs particularly well” is selected, it is only in combination with other factors and mainly because the topic reflects a significant issue. In the future, an additional reason for reporting on these topics could be that reporting is seen as a good tool for communicating internally and for improving everyone’s understanding of the topics. The Port of Gothenburg is not using the GRI Guidelines to guide its SR because it has not managed to implement the framework yet. An attempt was made in 2012, aiming for a C+ level, and the staff is still discussing this option since many of both the Port of Gothenburg’s customers and the other ports are using the GRI Guidelines.

To conclude the two previous sections - Findings regarding category 1 and 2 of ports -, Table 22 provides an overview of the most often cited reasons by ports for reporting indicators. Taking stakeholder concerns into account is significant in both category 1 and 2.

Table 22 Top 3 most cited reasons for reporting on environmental indicators in the port sector - both for ports reporting in accordance with the GRI Guidelines and for ports not reporting in accordance with GRI – obtained from the questionnaires

	Category 1 Ports reporting in accordance with GRI	Category 2 Ports not reporting in accordance with GRI
1	To meet the requirements of GRI	To respond to stakeholder concerns
2	To respond to stakeholder concerns	To meet legal obligations and/or pre-empt legally imposed requirements
3	To provide managers with an overview and understanding of the performance over time	To emphasize an area where they are performing particularly well

4.1.3 Category 3: Ports that are not reporting at all

Understanding the reasoning for why certain ports do not report on sustainability performance and what their points of views on the subject are is also of interest. Using a questionnaire, usually followed up by emails or oral discussion to clarify some points, both (1) the reasons why ports do not report and (2) the potential of some indicators were investigated. Several answer options were proposed for the first part. The second part focused on the “popular GRI indicators” to see how these ports would react to some of the GRI topics.

Nigerian Ports Authorities

There are several reasons why the Nigerian Port Authorities does not report on sustainability performance. Firstly, there is no demand from either inside the port company or from the outside to report on sustainability performance. Furthermore, Nigerian Ports, being signatories to International Maritime conventions through IMO, already comply with the requirements for shipping safety and security (Safety of Life at Sea (SOLAS) and International Safety Management Code (ISS) code) or more generally with Health, Security, Safety and Environment (HSSE). They do however plan to report and might consider the GRI Guidelines if governments use it too.

The answers are mixed as to whether environmental-related topics are seen to be significant for Nigerian Ports Authorities. “Direct energy consumption by primary energy source”(GRI-EN3) is seen as relevant since Nigerian Ports Authorities currently relies on electricity as the primary source of power and is therefore trying to tap into other sources of energy due to inadequate supply. The indirect consumption of that kind (GRI-EN4) is however not seen as

relevant by the Nigerian Ports Authorities. The “total direct and indirect greenhouse gas emissions by weights”(GRI-EN16) is recognised as a relevant topic for the practice of sustainability reporting since the impact is real, but is not yet a prioritised topic for the Nigerian Ports Authorities. The organisation has no incentive to reduce carbon and gas emissions. “Total weight of waste by type and disposal method” (GRI-EN22) is seen as relevant since the organisation has waste disposal and treatment facilities. “Initiatives to mitigate environmental impacts of products and services, and extent of impacts mitigation” (GRI-EN26) is seen as relevant since it is mandatory for the Nigerian Ports Authorities to carry out environmental impact assessment for all projects before their execution and regular environmental audits are carried out on critical projects. According to Nigerian Ports Authorities, it might potentially report on seasonal aquatic weed removal and the impediment to local navigation.

Independent Port of Strasbourg

One of the reasons the Independent Port of Strasbourg does not report on sustainability performance is that the process is too time consuming. It was therefore a management decision not to report. In addition, sustainable development is a relatively new topic for the Independent Port of Strasbourg and it therefore feels it needs some time to apprehend the associated various themes, added-value and projects to set up. In 2010, the port decided that sustainability reporting would be precipitous, as there were no concrete results to share. Therefore, before developing the communication side, they implemented concrete actions. However, the Independent Port of Strasbourg has not excluded the idea of sustainability reporting, and the general management is hoping for the process to take place by 2015 or 2016. Furthermore, although the Independent Port of Strasbourg does not publish a public report, in 2014 it commissioned an assessment of its sustainability actions, which will allow for both the formalisation of its sustainable development policy and the communication thereof with its partners and the general public.

Whether or not the Independent Port of Strasbourg sees certain environmental-related topics areas as significant varies. Firstly, “direct energy consumption by primary energy source” is considered relevant and significant; however “indirect energy consumption by primary source” is not a priority. Secondly, the Independent Port of Strasbourg sees the “total direct and indirect greenhouse gas emissions by weight” as a relevant subject, even though it is not currently taking any concrete actions on this matter. However, the port is now working on providing an overview of customers’ CO₂ emission during their handling. Thirdly, the “total weight of waste by type and disposal method” is also seen as relevant, due to the Independent Port of Strasbourg’s project on internal and navigation waste. Wastewater management is also a growing issue for them. Fourthly, the Independent Port of Strasbourg considers the topic “initiatives to mitigate environmental impacts of products and services” to be relevant and related to their work on inter-company transportation where initiatives on carpooling and public transportation are put in place. As an example of this work, the port aims to develop their own modal transfer for their companies (close rail offer, river shuttle for containers, etc.).

4.2 Lessons learned from GRI's experience

In this second section of findings, the information mainly comes from GRI. In order to better grasp the development of sector guidance within GRI as well as the current situation in the world of sustainability reporting, the researcher attended a meeting hosted by GRI. In addition, two follow-up interviews with GRI staff were organised with the aim of providing the port sector with broader recommendations in terms of sector guidance development.

4.2.1 Meeting with GRI

A meeting at GRI headquarter, in Amsterdam, was attended on the 24th of June, 2014. The meeting included two main parties: GRI and the port sector. The port sector was represented by three main ports reporting in accordance with GRI: the Port of Antwerp and the Port of Rotterdam (also representing PIANC and IAPH) and the Port of Ferrol. The meeting was initiated by both GRI and the Port of Antwerp, resulting from previous discussions on the need to work on sector guidance for the port sector. This section summarizes the main outcome of the meeting. Detailed information can be found in Annex 7.

- **On the port sector side:** The GRI Guidelines are reaching their limits when applying to the port sector and there is therefore a need for a Sector Supplement, or likewise. Initiatives are being developed to meet this need (cf. Chapter 2) but none are either widely accepted or complementary to the GRI Guidelines. PIANC and IAPH WG174 is willing to change this situation.
- **On GRI's side:** GRI has put the Sector Supplement on hold and is now reflecting on how they will deal with the Sector Supplement in the future. Therefore, the port sector was encouraged to go ahead with the development of "its own Sector Supplement". However, GRI is willing to provide help and will attend PIANC's next workshop. The following recommendations were already provided:
 - The development of a handbook for the port sector, acting complementarily to G4 could be the best option.
 - Regarding the boundaries setting of the reporting practice, it makes more sense for GRI to report on the whole port area, rather than to be limited to the port authority.
 - GRI advised to extend the WG174 to various port stakeholders. In addition to potential new perspectives, having an end-result with stakeholders involved would make the guidelines less vulnerable to critiques.

4.2.2 Interviews with GRI

Two follow-up interviews were conducted over Skype with GRI representatives. The questions for the semi-structured interviews were sent in advance, which allowed the interviewees to better reflect on the topics addressed.

Interview 1: Tamara Bergkamp, GRI

Tamara Bergkamp is Manager Reporting Standard at GRI and has participated in the development of 5 out of the 10 Sector Supplements. She was also involved in the Topics for Sectors research. The main outcomes of the interview conducted on the 16th of July, 2014 are summarized below, under the form of bullet point's recommendations for the port sector. Detailed information regarding this interview can be found in Annex 8.

- To identify through a list: what are the main activities and the more specific one. From this list, it is also necessary to identify the impacts associated with each activity and reflect on which impacts relied on the full activities of the port and which ones are related to some parts only. This differentiation will allow identifying where common problems are and what are specific for certain parts.
- To refine the list and prioritize activities (the inclusion of different type of professional in the working group has enabled for richer and stronger topic prioritization).
- To use the Topics for Sector as an inspiration for the development of the guidelines for ports. Certain Business Activity Groups included in this research might be of interest for the port sector (cf. Chapter 2).

Interview 2: Maaïke Fleur, GRI

Maaïke Fleur is Strategy Adviser at GRI and was involved in 8 out of the 10 Sectors Supplements. The main outcomes of the interview conducted on the 14th of July, 2014 are presented below under the form of bullet point's recommendations for the port sector. Detailed information regarding this interview can be found in Annex 9.

Before the creation of the handbook, which could be named "GRI interpretation guide for the port sector", the following steps could be undertaken:

- To prepare a paper exploring the resources availability through desk-based research. For example, this paper could look at the GRI Guidelines, available research on the port sector and review of port's SRs to identify indicators;
- To draft a project description highlighting the main steps, dates and deadlines, participant stakeholders, task repartition, etc.;
- To create a small website with the above mentioned element could also be envisaged to be further transparent.

Content-wise, the guidelines could contain the following elements:

- A reflection on the diversity of ports within the port sector in itself. Even if the decision is to develop guidelines for all ports, i.e. for the port sector as a whole, it is important to acknowledge and identify the degree of variety amongst them.
- A reflection on why it is necessary to have port specific interpretation of the GRI Guidelines;
- An introduction on why reporting is important for the sector and understanding the main sustainability impacts of sector organizations;
- Descriptions of sector stakeholders and how organizations can engage with them;
- A list of possible material topics for the sector;
- A list of possible material GRI Aspects and material GRI Disclosures for the sector;
- Explanations on how to understand certain GRI Disclosures for sector reporters;
- Examples of what to report on certain GRI Disclosures in the sector context;
- Suggestions on what could be added to GRI Disclosures to ensure that report readers fully understand;
- Relevant references to sector resources (for example, handbooks and tools).

5 Analysis

Under this section, the findings obtained are analysed using the theory discussed under the literature review (cf. Chapter 3). Firstly, the broad picture provided by the findings is analysed with a deeper focus on the Stakeholder theory. Secondly, each aspect and indicator under GRI G3 is reviewed in the light of previous studies' results, while potential new indicators adapted to the port sector are also highlighted.

5.1 Stakeholder theory analysis: broader perspective

One first reviews Ullman (1985)'s three dimensions (cf. Chapter 3), the following comments can be made for the port sector.

- (1) **Stakeholder power:** a firm's response to the intensity of stakeholder demand seems clearly significant to the port sector. Nearly all ports have reported that one of the reasons for disclosing sustainability information is "to respond to stakeholder concerns", which reflects this first dimension's demand from stakeholders. In addition, ports that are already oriented towards GRI G4 cater even more to stakeholders' demands in their choice of topics. This dimension is further detailed in the next paragraphs.
- (2) **Strategic posture:** the way a firm responds to social demand also seems to be present in the port sector. Ports under analysis have adopted an active strategic posture through both their EMS and the disclosure of their environmental or sustainability performance. While disclosure and EMS are two complementary but distinct activities, EMS has been identified as a potential environmental indicator within the disclosure practice.
- (3) **Economic performance:** Although perhaps less significant than the two first dimensions, the relative weight of social demand and the attention it receives should also be taken into consideration. Occasionally, ports mentioned that the reason for not reporting on certain indicators was low resources. Some ports also noted, e.g. the Port of Ferrol, that due to the crisis, a bigger emphasis is put on the economic indicators. However, ports that are not (yet) reporting (category 3) do not mention economic resources, or lack thereof, as part of their reasoning for not reporting. Therefore, although economic objectives can take precedence over environmental objectives when a port's economic performance situation is unstable, other dimensions, e.g. stakeholder power, have a bigger influence on disclosure. This observation confirms the findings of Elijido-Ten (2009) who identified the third dimension as the less significant one.

The dominant trend observed throughout this study was that ports reporting in accordance with GRI disclose indicators for three main reasons: (1) to meet the requirements of GRI, (2) to respond to stakeholder concerns and (3) to provide managers with an overview and understanding of the performance over time. These three elements further back up the Stakeholder theory as a relevant school of thought explaining sustainability disclosure.

(1) To meet the requirements of GRI

Justifying the disclosure of environmental information based solely on the need to meet the requirements of GRI might not seem to be the most legitimate rationale. When this situation was identified, e.g. as was the case for some indicators at the Port of Ferrol, it helped pinpoint indicators which were disclosed to fulfil the GRI requirements, regardless of the indicator's materiality. Most of the time however, ports provided this justification in addition to other reasons for reporting. The combination of the desire to meet the requirements of GRI with

other reasons therefore leads to a more legitimate rationale, especially when these other reasons were themselves more acceptable. Expressing the need to meet the requirements of GRI in these cases then mainly showed the influence of GRI as a stakeholder for the reporting company. Previous literature on sustainability reporting has not proposed GRI as a reason to report on some indicators or as one of the most important stakeholders for the reporting companies. These findings demonstrate that the shift from G3 to G4 proposed by GRI is highly relevant. Under G3, companies tend to report on as many indicators as required by GRI, regardless of their relevancy to the organisation, reflecting a “why fight against the system” mentality. With G4, the focus on materiality is more emphasised, leading companies to report only on what is significant for them. Reporting practices where companies try to disclose as many GRI indicators as possible should be reduced under G4. Similarly, G4 will also put a stop to ranking companies by a scoring system, a practice often criticised for being a biased reflection of the situation. G4’s elimination of this practice also gives credit to the present study’s methodological approach: identification of indicators’ scores, as opposed to companies’ scores, and analysis of the rationale behind each disclosure. One more aspect of GRI must be noted: GRI has a significant – even monopolistic - place the organisation in the world of sustainability reporting. Nearly all ports not reporting in accordance with GRI (category 2) or not reporting at all (category 3) mentioned they aim towards GRI reporting someday. All in all, this demonstrates that GRI has become the main reference for reporting practice, providing both transparency and legitimacy to the ports using the Guidelines. This is in line with previous studies, e.g. KPMG (2013b), which highlight GRI’s dominance as a reporting guidelines setter in all sectors.

(2) To provide managers an overview/understanding of the performance over time

The fact that ports provide this reason puts forward managers as another significant stakeholder. Moreover, it emphasises that – at least in the port sector – sustainability reporting has moved past the stage of being a tool to legitimise activities. Indeed, according to the results, ports are not only utilising sustainability reporting as part of the process of legitimisation providing them with a “license to operate”. This result goes against a massive body of literature, which identified the legitimacy theory as the prime factor for reporting. This reason for reporting here emphasises that sustainability reporting has the potential to bring about organisational change. It is however surprising to observe that the reason “to provide manager with data allowing benchmarking” was not frequently mentioned since one of the aims of sustainability reporting is to enable benchmarking. This situation could be due to either the non-necessity from ports to benchmark or the lack of appropriate indicators common for the port sector.

(3) To respond to stakeholder concerns

This last aspect highlights the importance of Stakeholder theory when discussing factors encouraging companies’ disclosure. In this study, the findings have showed that ports are using sustainability reporting to both respond to stakeholders’ needs and to incorporate their demands. The three main reasons for reporting highlighted in this section all reflect the importance of various stakeholders, i.e. GRI, managers, and a broader “port stakeholders” category. The importance of stakeholders was also pinpointed more specifically by ports already reporting in accordance with G4, which demonstrates that the topics reported by these ports are material to stakeholders. Furthermore, the only port that is not willing to report in accordance with GRI, i.e. Groningen Seaports, explains that there is no demand from their stakeholders to do so. This fact reinforces the importance of stakeholders and their decisional power over companies.

There is no straightforward identification of which of a port’s stakeholders most influence the reporting practice. While some ports list different stakeholder groups for different aspects, others report the same category of stakeholders for all indicators. The main trend is however

to report for stakeholders from the port community and environmental lobby groups. In addition, ports also report on sustainability to respond to the concerns of NGOs, customers and to some extent, shareholders and local authorities. From this, it seems that there are different levels of stakeholder significance in the port sector— at least when it comes to sustainability reporting. Therefore, this study goes against the branch of Stakeholder theory stating that all stakeholders have the same weight in terms of importance. Except for the Port of Sines, which prioritises internal stakeholders, all ports are reporting to respond to both internal and external stakeholders. When looking at aspect categories more specifically, the aspect Energy is directed towards suppliers and customers as well as towards NGOs. Ports address the aspect Biodiversity indicators mainly to answer to environmental lobby groups and NGOs, and the aspect Emissions, effluents and waste indicators are reported for environmental lobby groups, customers and the society as a whole.

Another element that has brought to light stakeholders' significance is the issue of **reporting boundary**. Whether ports should report on the sustainability performance of the port authority or of the whole port area, or of both, is vague. The next sections analysing each indicator have highlighted the different positions taken by ports nowadays. It has been identified that ports disclose information mainly to respond to stakeholders concerns and these stakeholders often want to obtain information on the performance outside the port authority. For example, it makes sense that the community living near the port is less interested in reading about paper and pen consumption at the port authority when an oil spill in the port area might have a large effect on water and biodiversity. Stakeholders therefore want – most of the time – to receive sustainability information on aspects pertaining to the port area too. In addition, the advice provided in the interviews with GRI was to extend the reporting boundaries to operations that ports do not necessarily have operational control over, i.e. the port area. In any case, the decision pertaining to the setting of the reporting boundaries will be decisive for the future of sustainability reporting in the port sector.

5.2 GRI's indicators analysis in light of theory

As explained in the introduction, four main hypotheses have been used as a driver for this thesis: data availability, public relation impression, genuine differences and different stages of evolution. The main idea behind the elaboration of hypotheses was that if one indicator was identified from a questionnaire (cf. Chapter 3), as having been reported for a “legitimate” reason, then it could be kept in mind for the development of sector guidance for ports. If, on the other hand, the indicator was reported for an illegitimate reason, it could be left out. The two first hypotheses, data availability and public relation impression, are linked to companies' internal reasons and motivations. With these two reasons, there is a risk that sustainability reporting is utilised as a “brochure” to sell the company, making these reasons illegitimate. The third hypothesis, however, reflects companies' own contextual reasons and therefore seems to be more legitimate. The fourth reason, different stages of evolution, is connected to the first one, data availability, but gives a broader heading to include honest companies that are not completely successful in their sustainability reporting effort. With this aspect analysis, each indicator is discussed according to the four hypotheses and the various “reasons for reporting” identified in previous studies. As emphasised in the introductory chapter and as proven in the findings, one reason alone cannot explain the disclosure of information. Indicator disclosure might rely on a combination of reasons, which might potentially transform an identified illegitimate reason into a more acceptable one. However, these kinds of reasons have most of the time been complemented with other reasons, which legitimises the disclosure and shows the honesty of the response.

5.2.1 Material

The aspect Material is not a frequently reported category amongst ports. Indeed, the reporting average of this category of indicators is the lowest, i.e. 23%, out of all the other categories of aspects. This result confirms the trend previously highlighted by other studies: many companies usually fail to report on this category (Petrushevski, 2014; Roca & Searcy, 2012; Skouloudis et al., 2010).

EN1 Materials used by weight or volume: Only 4 ports out of the 13 (31%) reporting in accordance with GRI are using this environmental indicator. This low score confirms the results of previous studies, for example, Skouloudis et al. (2010), which highlight that EN1 is a GRI core environmental indicator that is usually either not discussed or briefly mentioned by companies. Of the four reporting ports, Bremen Ports and the Port of Tianjin report partially on EN1, while both the Ports of A Coruña and Ferrol fully report on this topic. The Port of Ferrol explains that it reports on EN1, first, to fulfil the requirements of both GRI and ISO 14001, second, to comply with legislation, third, to respond to stakeholders' concerns and fourth, to provide managers with an overview and understanding over time as well as with data about the risks and opportunities.

EN2 Percentage of materials used that are recycled input materials: Only 2 ports out of the 13 (15%) reporting in accordance with GRI are using this environmental indicator, which makes it one of the least frequently reported indicators amongst ports, together with EN19 and EN27. It was however reported by both the Ports of A Coruña and Ferrol. Both the Port of Ferrol and the Port of A Coruña report on 26 out of the 30 environmental indicators. This occurrence might reflect two different situations. The first possible situation is that the two Spanish ports are reporting on as many indicators as possible, including EN2 and EN1, regardless of their materiality. This situation would support the second hypothesis; public relation impression. In the second possible scenario, this occurrence could reflect the fact that EN1 and EN2 are not the most significant indicators when ports prioritise them, but that they can however be totally relevant when pushing the reporting process to a relatively high level. This second scenario would then support the fourth hypothesis: different stages of evolution, and does seem to apply to the Spanish ports. These ports provide examples on how to report on material used internally, i.e. in port authorities' offices and workshops (paper, batteries, cleaning solvent, etc.), and on material used from maintenance and port activities (various containers, wood, mixed waste, etc.). Both the Ports of Ferrol and A Coruña report on these two indicators under the waste management indicators proposed by Ports of the State (cf. Chapter 2). One can therefore assume that the reason for reporting on EN1 and EN2 is mainly contextual to the Spanish system.

To sum up the Material aspect section, when a relatively high level of reporting is reached, reporting on EN1 and EN2 can also be a way for port authorities to “practice what they preach”. They can lead by example for all the companies under their control, even though port authorities usually only have indirect effects. If such a path is taken, the Spanish system can provide an example on how to report on the material used. However, it is reasonable to state that, as for other sectors, EN1 and EN2 are not a priority for ports. Ports are reluctant to report on, for example, pens and paper used at the port authority while other pressing issues occurring in the port area, e.g. oil spills, could be reported on. Therefore, the researcher proposes that these indicators could be set aside for the development of a Sector Supplement, or the equivalent, for the port sector.

5.2.2 Energy

Previous studies analysing all sectors combined, e.g. Roca & Searcy (2012), highlight the high disclosure rate of environmental indicators focusing on energy and water. The present findings confirm that the port sector is also fond of indicators related to the energy aspect. Indeed, the average disclosure rate of all indicators pertaining to energy, 60%, is higher than that of indicators regarding the other aspect categories.

EN3 Direct energy consumption by primary energy source: 10 ports out of the 13 (77%) reporting in accordance with GRI are using this environmental indicator. It is one of the most reported indicators by ports, shortly after EN16 and EN22. This confirms previous studies' observations, e.g. Roca & Searcy (2012), which highlight EN3's popularity amongst companies. When ports were asked why they report on EN3, the recurrent answers were the following: to meet the GRI requirements, to respond to stakeholder concerns and to provide managers with an overview and understanding of the performance over time. Other specifications were also provided, for example by the Port of Antwerp, which states that the disclosure of EN3 is also a way to enhance discussion and improve measures to reduce energy consumption. Furthermore, ports that are not reporting at all (category 3) support the idea of reporting on direct energy consumption since they believe it is relevant to their port operations. For ports that did not report on this indicator, the reasons for not reporting were either that there is no demand from inside, that it is too time consuming or that it has been identified as non-material to their activities. All in all, it seems that EN3 is a significant indicator, not simply due to its popularity. Reporting on EN3 also responds to stakeholder demands and has the potential to provide ports with a tool for both management and discussion, which therefore supports the third hypothesis, genuine difference. Therefore, this indicator could be kept for the development of the Sector Supplement, or the equivalent.

EN4 Indirect energy consumption by primary source: 8 ports out of the 13 (62%) reporting in accordance with GRI are using this environmental indicator. While one might think that ports would have similar rationales for EN4 and EN3, this is not the case. Port Metro Vancouver reports that they use this indicator in order to meet the GRI requirement, to satisfy "due diligence" requirements and to provide managers with an overview and understanding over time, and finally due to the significance to both stakeholders and the organisation. While Port Metro Vancouver's last two reasons seem to be more legitimate than the first two, they were provided for every indicator's disclosure justification. Therefore, it does not help to get an overview on EN4 specifically. However, the Port of Ferrol provided different reasons for each indicator and only communicated one single reason for reporting on EN4: the need to meet the GRI requirements. This therefore raises question whether reporting on indirect energy consumption is really material for the port sector or whether it is done to satisfy GRI. In addition, the reasons for not reporting EN4 provided by both the Ports of Antwerp and Rotterdam further question the indicator and highlight its complexity. EN4 is considered too complex to estimate and it is almost impossible to set the boundaries for this indicator. Therefore, pushing the boundaries to include hundreds of companies working in the port area might lead to a very complex reporting procedure. This situation supports the first hypothesis influencing disclosure: data availability. As for the ports that are not reporting at all (category 3), while both supported the idea to report on EN3, they do not find EN4 relevant or at least do not see it as a priority. It highlights that reporting on energy consumption, even though such consumption is demonstrated to be significant, is driven mainly by GRI. To conclude on this indicator, it could be kept for the development of a Sector Supplement, or the equivalent, but with a specification - even a limitation - of which organisations to cover.

EN5 Energy saved due to conservation and efficiency improvements: 6 ports out of the 13 (46%) reporting in accordance with GRI are using EN5 in their reports. On average, this indicator is mainly reported by ports to meet the GRI requirements, to respond to stakeholder concerns and especially to provide managers with an overview and understanding of performance over time. This combination of reasons seems to be relatively legitimate. However, the findings showed that reporting on EN5 in the port sector (but probably also in other sectors) might – once again - lead to a complex reporting process. Indeed, some ports could not clearly target the amount of energy saved due to conservation and efficiency improvement, as energy savings often depend on several factors. The complexity of this indicator therefore supports the first hypothesis influencing disclosure: data availability. This topic has not been identified amongst ports that are not reporting in accordance to GRI (category 2). All in all, it seems that EN5 is reported for legitimate reasons and is material to the port sector, but the technical complexity of the indicator can make reporting difficult. However, these difficulties must not specifically appear in the port sector. Therefore, EN5 could be kept for the development of a Sector Supplement, or the equivalent, but by specifying the reporting boundaries.

EN6 Initiatives to provide energy-efficient or renewable energy-based products and services, and reductions in energy requirements as a result of these initiatives. 6 ports out of the 13 (46%) reporting in accordance with GRI are using this environmental indicator, which is a relatively good score compared to that of other indicators. This is in line with the results of Skouloudis et al. (2010), who found that internally developed initiatives to increase energy efficiency and to promote renewable energy sources - not necessarily in a GRI context - are the most cited environmental topics in companies' SRs. Ports reporting on EN6 mainly use it to respond to stakeholder concerns and to provide managers with an overview and understanding and the performance over time. These two main reasons for reporting EN6 seem to be legitimate, supporting the third hypothesis as a reason for disclosure: genuine difference. Furthermore, this topic has been recurrently observed in various ports' SRs outside the GRI context. All in all, it seems that EN6 could be kept for the development of a Sector Supplement, or the equivalent.

EN7 Initiatives to reduce indirect energy consumption and reductions achieved: 6 ports out of the 13 (46%) reporting in accordance with GRI are using this environmental indicator. It has been noticed that ports reporting on EN6 necessarily also report on EN7. The reasons for reporting on the indicator EN7 are also similar to those for reporting on EN6: to respond to stakeholder concerns and to provide managers with an overview and understanding of the performance over time. One might wonder if this high connection between EN6 and EN7 has resulted in redundancy in companies' previous reports, since GRI adapted these indicators under the new generation of Guidelines. The researcher would advise that EN7 should be kept for the development of a Sector Supplement, or the equivalent.

In the G4 energy aspect category, EN5, EN6 and EN7 from G3 are replaced by **Energy intensity** (G4-EN5), **Reduction of energy consumption** (G4-EN6) and **Reductions in energy requirements of products and services** (G4-EN7). **Energy Intensity** (G4-EN5) is not included in Transnet's SR, is not considered to be material to internal stakeholders at the Port of Sines, but is taken into account by the Port of Antwerp²⁶. It reports on Energy intensity to respond to stakeholder concerns and to provide managers with (1) an overview and understanding over time, (2) data for analyses of risk and opportunities and (3) data allowing benchmarking with other ports. In addition, disclosure of Energy intensity enhances discussion and improves measures to reduce energy consumption. This indicator seems material for the Port of Antwerp, suggesting the third hypothesis, i.e. genuine difference is applicable here, and highlighting the potential of G4-EN5 in the port sector.

²⁶ It is reported as the energy usage and energy sources used by the different sectors related to the production index.

5.2.3 Water

Water has been highlighted by previous studies (Roca & Searcy, 2012) as one of the aspects most frequently reported by companies. While a reasonable percentage of the port sector still reports on water issues, 44%, this aspect category comes fifth in the reporting rankings after the energy, emission effluent and waste, compliance and overall aspects.

EN8 Total water withdrawal by source: 8 ports out of the 13 (62%) reporting in accordance with GRI are using this environmental indicator, which is a fairly good percentage. Both the Ports of Antwerp and Ferrol report on EN8 to meet the GRI requirements, to respond to stakeholder concerns and also to provide managers with data for analysis of risk and opportunities. Unlike the first two reasons provided by the Ports of Antwerp and Ferrol, the last one has been rarely selected by ports as a reason for reporting on any indicator. Therefore, this reason could reflect a particular characteristic of this indicator, and EN8 could be a tool to help ports monitor risk and opportunities. The Port of Antwerp further specifies that reporting on EN8 enables it to create awareness regarding sustainable (re-)use of water. Water withdrawal has also been identified in non GRI-reports. However, some ports do not report on EN8 - for example, the Ports of Rotterdam and Sines. These two decided not to report on any of the indicators under the water aspect, since water withdrawal relates only to personal use by employees, which they do not consider to be material in the port sector. To sum up, in addition to EN8's relative popularity amongst ports, the reasons for reporting on EN8 seem legitimate and are driven by genuine difference (third hypothesis) for the port sector: on the one hand, EN8 is a response to stakeholders and on the other, it is a management tool. Therefore, EN7 could be kept for the development of a Sector Supplement, or the equivalent, although it should specify the reporting boundaries. Extending them to the port area would probably be of interest for stakeholders.

EN9 Water sources significantly affected by withdrawal of water: 4 ports out of the 13 (31%) reporting in accordance with GRI are using this environmental indicator, which is a relatively low percentage. The Port of Ferrol reports that the only reason it reports on this indicator is to comply with the GRI requirements, and this does not present EN9 as very material indicator. However, the Port of Antwerp provides a more nuanced answer by adding that reporting on EN9 allows it to respond to stakeholder concerns. The analysis of EN9 provides us with a rather limited insight of its materiality. If the indicator is not set aside, it could be – as EN8 - kept for the development of a Sector Supplement, or the equivalent, if explanations are provided regarding the reporting boundaries.

EN10 Percentage and total volume of water recycled and reused: 5 ports out of the 13 (36%) reporting in accordance with GRI are using this environmental indicator, which is higher than EN9's score but still relatively low. The Port of Antwerp reports EN10 in order to meet the requirements of GRI, to satisfy “due diligence” requirements and to enhance the re-use of rainwater. However, the Port of Ferrol reports on EN10 only to meet the GRI requirements. This outcome is relatively similar to the analysis of the previous indicator, providing a mixed view on the usefulness and materiality of this indicator in the port sector. A similar conclusion than the one for EN9 is therefore proposed: EN10 should be kept for the development of a Sector Supplement, or the equivalent, if explanations are provided regarding the reporting boundaries.

The water issue seems to be relevant for both ports reporting in accordance with GRI and those that are not using these guidelines. However, once again, it seems clear that the reporting boundaries will have to be clearly fixed for all ports, i.e. should the area covered include the port authority, the port area or both. It is more likely that stakeholders will be interested in both disclosures. In the port area, the topic “water” is highly relevant when it comes to both

the water used by companies and the body of water usually surrounding ports. An indicator related to the water quality of the surrounding body of water could be envisaged. Indeed, a recurrent topic reported by different port categories but not included in the GRI Guidelines was identified: **water quality**. This is an indicator reported by many ports to provide managers with an overview and understanding of the performance over time, and also to provide data allowing benchmarking with other ports. Furthermore, water quality is monitored under both legislation and EMS, which is an additional reason to report on this topic.

5.2.4 Biodiversity

This aspect category comes in seventh out of the 10 categories, with an average reporting score of 37%. Ports of Sines and Vancouver, do not report on any of the biodiversity-related indicators since they believe the indicators described by GRI are not material to their operations²⁷. However, some ports do report on the biodiversity aspect and the following paragraphs further detail this choice.

EN11 Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas: 6 ports out of the 13 (46%) reporting in accordance with GRI are using this environmental indicator. Ports that do report on EN11 are mainly doing it to respond to stakeholder concerns, i.e. to environmental lobby groups' and the community's concerns, but they also report to meet legal obligation and/or pre-empt legally imposed requirements. These reasons for disclosing information on biodiversity clearly underline the pressure from outside and show the relevance here of the third hypothesis: disclosure due to genuine difference. To some extent, reporting on EN11 is also a way to meet the requirements of GRI, and, for the Port of Antwerp, to emphasise an area where the port performs particularly well. These two reasons are more related to the second hypothesis, which highlights public relation impression as a reason for reporting. However, these reasons are complemented by genuine differences reasons, which legitimises the disclosure of this indicator. The Port of Rotterdam also mentions that the disclosure of EN11 was driven by competitor response to environmental issues, but that it still helps the port provide managers with an overview and understanding of the performance over time. To sum up, even though EN11 is mainly used by ports to promote or maintain the port's image, it also responds to external pressure, e.g. stakeholders and legislation. Therefore, it seems that EN11 could be kept for the development of a Sector Supplement, or the equivalent.

EN12 Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas: 5 ports out of the 13 (38%) reporting in accordance with GRI are using this environmental indicator. Mainly, the motive for disclosing EN12 is the desire to respond to stakeholder concerns, i.e. to the concerns of environmental lobby groups and of the port community as a whole. To some extent, ports also report on EN12 to comply with legislation, especially in the Spanish port system, where both the Ports of La Coruna and Ferrol report on the entire biodiversity section. Furthermore, EN12 is sometimes indicated as a useful tool for managers to get an overview and understanding of the performance over time. When ports report on EN11 but not on EN12, e.g. as does the Port of Antwerp, the main reason for the omission of EN12 is the lack of comprehensive data available, i.e. the first hypothesis. Like EN11, EN12 is also disclosed due to external pressure from both stakeholders and legislation. Unlike EN11 however, EN12 does not seem to be utilised by ports as a promotion tool. This makes sense, since EN12 tends to reflect a more negative image, i.e. the impacts of port activities on biodiversity, while EN11 represents a neutral or positive picture, i.e. how biodiversity and

²⁷ The Port of Rotterdam, although reporting on 4 out of the 5 biodiversity indicators, states that this batch of indicators is less relevant, or even irrelevant, for the port authority, since only a very small fraction of the port area is bounded by nature.

ports are living together. It is not excluded that the lower rate of ports reporting on EN12 is related to the negativity of the indicator and the advice would therefore be to keep EN12 for the development of a Sector Supplement, or the equivalent. However, it will be necessary to refine it to the port sector, by for example, extending the reporting boundaries to the whole port area.

EN13 Habitats protected or restored: 6 ports out of the 13 (46%) reporting in accordance with GRI are using this environmental indicator. The reasons that lead ports to report on this indicator are mainly: to comply with legislation and pre-empt legally imposed requirement, to comply with the requirements of GRI and to respond to stakeholder concerns. To a lesser extent, ports do mention that EN13 is also a way to emphasise an area where they perform particularly well. The conclusion that can be drawn from these answers is similar to the conclusion for EN11: this indicator is mainly used by ports to promote or maintain the port's image but can also be used to respond to external pressure, e.g. stakeholders, legislation and GRI. Therefore, EN13 could be kept for the development of a Sector Supplement, or the equivalent, if the reporting boundaries are set on the whole port area.

EN14 Strategies, current actions, and future plans for managing impacts on biodiversity: 4 ports out of the 13 (31%) reporting in accordance with GRI are using this environmental indicator²⁸. Regarding ports that are reporting on EN14, once again, the main disclosure driver is the desire to respond to stakeholder concerns. In addition, meeting and/or pre-empting legislation as well as complying with the GRI requirements are also relevant factors. Furthermore, both the Ports of Los Angeles and Ferrol report that they use EN14 to get an overview and understanding of performance over time. Similarly to EN12, EN14 is mainly used as a tool to respond to external requirements and concerns. From these relatively legitimate reasons, it seems that EN14 could be kept for the development of a Sector Supplement, or the equivalent.

EN15 Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk: 3 ports out of the 13 (23%) reporting in accordance with GRI are using this environmental indicator. The main reasons provided by ports when reporting on EN15 are: to respond to the requirements of GRI, to respond to stakeholder concern and to meet and or/pre-empt legislation. The Port of Antwerp also mentions it uses EN15 as a way to get an overview and understanding of the performance over time, even though it does not provide this reason for the other indicators reported under biodiversity. EN15 could be kept for the development of a Sector Supplement, or the equivalent, with modification regarding the reporting boundaries. These should be extended to the port area as a whole.

Port's main reason for reporting biodiversity indicators is to respond to stakeholder concerns. However, it is within the biodiversity aspect that legislation has been most often mentioned by ports as a reason for reporting. This emphasises the importance of the third hypothesis, i.e. reporting due to genuine difference. Similarly, another reason rarely provided by ports except under the biodiversity aspect, is the possibility to emphasise an area where ports perform particularly well. This justification was however never provided on its own, which somewhat legitimises the disclosure of biodiversity indicators. In the category of ports that do not report in accordance with GRI (category 2), all of the ports report on biodiversity somehow²⁹. Both

²⁸ This reporting rate is relatively low, but it should be noted that this G3-EN14 indicator is not present under G4, necessarily excluding the option for the Ports of Antwerp, Sines and Transnet - ports reporting in accordance to G4 - to report on this topic

²⁹ flora and fauna survey, vegetation monitoring result (Groningen Seaports), m² built up area/worker Port (Port of Valencia), compensation area (Ports of Gothenburg and Ghent, Groningen Seaports)

legislation and stakeholder concerns particularly drive the disclosure of information on biodiversity. To conclude this section, **compensation area** has been identified as a very recurrent and frequent topic amongst ports and could therefore be considered for the development of Sector Supplement, or the equivalent.

5.2.5 Emissions, effluents and waste

With a reporting rate of 51%, the aspect category “Emissions, effluents and waste” takes the third place in the aspect category ranking, after the aspects Energy and Compliance.

Emissions

EN16 Total direct and indirect greenhouse gas emissions by weight: 11 ports out of the 13 (85%) identified as reporting on sustainability performance in accordance with the GRI framework are using EN16. This reporting rate makes EN16 the most reported environmental indicator amongst ports using the GRI Guidelines (cf. category 1), together with EN22. This result confirms the findings of previous studies, e.g. Petrushevski, 2014; Roca & Searcy, 2012; Skouloudis et al., 2010, which note that GHG emission is covered in the majority of reports in various sectors. Under G4, this indicator has now been divided into two indicators: (1) total direct GHG emissions by weight and (2) total indirect GHG emissions by weight. As for the rationale behind the reporting process, ports reporting on EN16 are generally doing so to respond to stakeholder concerns and to meet the GRI requirements. In addition, reporting on EN16 provides ports’ managers with both an overview and understanding of performance over time and data for analysis of risks and opportunities. Only the Port of Sines considers this environmental indicator to be non-material and therefore does not report on it. When asking ports that are not (yet) reporting on environmental performance (category 3), both the Independent Port of Strasbourg and the Nigerian Ports Authorities can see EN16 as a relevant indicator for the practice of sustainability reporting in their port contexts. To conclude, it seems that the disclosure of EN16 is driven by the requirements of GRI but also and mainly by stakeholders, and is in addition, a tool used by managers to manage GHG. The reasons for reporting on EN16 seem to be material, which supports the third hypothesis, i.e. disclosure due to genuine difference. Therefore, it seems that EN16 should definitely be kept for the development of a Sector Supplement, or the equivalent.

EN17 Other relevant indirect greenhouse gas emissions by weight: 8 ports out of the 13 (62%) identified as reporting on sustainability performance in accordance with the GRI Guidelines are using EN17 in their reports. Like EN16, EN17 has a good reporting score, which confirms the results of previous studies that highlight companies’ interest in reporting on GHG-related topics. Ports report on this indicator mainly to respond to stakeholder concerns. This supports the third hypothesis, i.e. disclosure due to genuine difference. To some extent, EN17 is also reported in order to meet the GRI requirements and to provide managers with an overview over time. The reasons ports do not report on this indicator are various. The Port of Sines does not consider it to be material to the company, the Port of Antwerp does not have comprehensive data on the topic and the Port of Los Angeles is at an early stage of reporting and therefore does not see EN17 as a priority. Respectively, the latter two reasons support the first hypothesis, i.e. data availability, and the fourth one, i.e. different stage of evolution. All in all, it seems however that EN17 is a relatively frequently reported and material indicator that should be kept for the development of a Sector Supplement, or the equivalent.

EN18 Initiatives to reduce greenhouse gas emissions and reductions achieved: 9 ports out of the 13 (69%) identified as reporting on sustainability performance in accordance with the GRI framework are using EN18 in their reports. EN18 therefore has a relatively high

score³⁰. Amongst ports that are reporting on EN18, the main reason to disclose it is, once again, to respond to stakeholder concerns. Then, ports also mention they report on EN18 to respond to the requirements of GRI and to provide managers with an overview and understanding of the performance over time. To a lesser extent, EN18 is also disclosed due to legal requirements, e.g. at the Ports of Ferrol and Los Angeles. All in all, it seems that EN18 could be kept for the development of a Sector Supplement, or the equivalent.

Under G4, EN18 has been removed and replaced by two other indicators related to GHG: “**GHG emission intensity**”(G4-EN18) and “**Reduction of GHG emissions**” (G4-EN19). GHG emissions intensity is not reported by the Port of Transnet and has been identified as non-material to stakeholders at the Port of Sines. However, the Port of Antwerp makes use of this indicator in its SR³¹. In addition to the often-cited reasons (stakeholders and GRI-related), the Port of Antwerp also reports on this indicator to provide managers with an overview and understanding over time and with data allowing benchmarking with other ports. One can therefore see the potential of G4-EN18 within the field of reporting.

EN19 Emissions of ozone-depleting substances by weight: 2 ports out of the 13 (15%) identified as reporting on sustainability performance in accordance with the GRI framework are using EN19 in their reports. This is a relatively low score, positioning EN19 as one of the least reported indicators in the port sector. The two ports reporting on this indicator are Spanish, i.e. the Port of Ferrol and the Port of La Coruna. The Port of Ferrol reports on EN19 to meet the requirements of both GRI and ISO 14001, to respond to stakeholder concerns, to provide managers with both an overview over time and data for analyses of risks and opportunities. In addition, the Port of Ferrol also mentions that the disclosure of EN19 is also a way to comply with legislation or pre-empt legally imposed requirements. This last reason for disclosure seems to place EN19 as a significant indicator mainly for the Spanish port system. The disclosure of this indicator therefore supports the third hypothesis, i.e. disclosure due to genuine difference, but for the Spanish port system, rather than for the port sector in general. Due to its low materiality for the port sector, the researcher therefore proposes to left aside EN19 for the development of a Sector Supplement, or the equivalent.

EN20 NO_x, SO_x, and other significant air emissions by type and weight: 7 ports out of the 13 (54%) identified as reporting on sustainability performance in accordance with the GRI framework are using EN20 in their reports. As with previous indicators, ports are reporting on EN20 mainly to respond to stakeholder concerns, to meet the GRI requirements and to provide managers with an overview and understanding of the performance over time. Individually, ports also mention other various reasons, such as the evaluation of a joint program of measures taken regarding fine dust at the Port of Antwerp. This batch of reasons seems legitimate and supports the third hypothesis, i.e. disclosure due to genuine difference for ports. However, some ports do not report on EN20 since they consider the indicator to be non-material for them as a service company. It therefore seems that, once again, the significance of an indicator in the port sector mostly depends on the port authority’s decision to report on its own activities or to extend the reporting boundaries to activities it does not have operational control over. In any case, the NO_x and SO_x issues are definitely increasingly significant issues and have been given particular attention lately on both the regional and international levels. Indeed, the IMO’s revised Annex VI to MARPOL and the transposed Sulphur directive in the EU, which introduced stricter sulphur limits for marine fuel as well as engine

³⁰ Especially given that EN18 is removed under G4, and so the Ports of Antwerp, Sines and Transnet – which already use G4 - did not have the option to report on it. To some extent, one could therefore say that EN18 is reported at 90% (9 ports out of 10), making it the most frequently reported environmental indicator.

³¹ Through the emission of carbon dioxide and equivalents related to the production index.

requirements regarding NOx emissions, accentuate even more the significance of these issues. EN18 could therefore be kept for the development of a Sector Supplement, or the equivalent, by specifying both the reporting boundaries and the link to MARPOL.

In addition, the following related topics have been highlighted as recurrent in ports' SRs and might therefore represent potential indicators: "**initiatives to provide low sulphur marine fuel or alternative**" (e.g. LNG supply), **initiatives to incentivise low sulphur emitters** (e.g. discounted harbour due rate such as ESI) and **associated awards**. These topics are of course linked to the energy aspect and also reflect the importance of transport and logistics elements in the port sector.

To conclude the analysis of this batch of indicators related to emission, another non-GRI topic is proposed. **Air quality** has been identified as a common topic for ports to report on. Air quality, i.e. concentration of pollutant in the air, can be seen as complementary to EN20, i.e. emission (cf. Chapter 4, e.g. the Port of Antwerp). The three Spanish ports under analysis all report on air quality. Their disclosure of air quality information is mainly driven by Ports of the State requirements (cf. Chapter 2), but reporting on air quality is also a response to stakeholder concerns. In addition, the topic of air quality has been identified in other SRs, e.g. the SRs of Port of Antwerp, the Port of Ghent, Groningen Seaports, etc. The common reason for these ports to report on air quality is mainly to provide managers with an overview and understanding of the performance over time.

Effluents and Waste

EN21 Total water discharge by quality and destination: 6 ports out of the 13 (46%) identified as reporting on sustainability performance in accordance with the GRI framework are using EN21 in their reports. Ports that report on EN21 do so in order to meet GRI's requirements, but also to respond to stakeholders' concerns. To some extent, reporting on EN21 provides managers with an overview and understanding of the performance over time. Ports that are not using this indicator in their SR, for example the Port of Rotterdam, claim that EN21 is not or less relevant for their companies. Water abstraction relates only to personal use by employees, which is not really what the organisation and their stakeholders want to learn about in a port SR. Once again, this brings us back to the issue of boundary setting, i.e. information disclosure on the port authority only vs. on the port area as a whole. EN21 could be kept for the development of a Sector Supplement, the equivalent, but by specifying the reporting boundaries. As previously mentioned under the Water aspect category, another water-related topic has been identified: **water quality**.

EN22 Total weight of waste by type and disposal method: 10 ports out of the 13 (77%) identified as reporting on sustainability performance in accordance with the GRI Guidelines are using EN22 in their reports. This is a high reporting score, positioning EN22 as one of the most frequently reported indicators in the port sector. Ports report on EN22 for two main reasons: to meet the requirements of GRI and to respond to stakeholder concerns. More specifically, some ports note that EN22 has been identified as material to stakeholders. In addition, this indicator also provides port managers with an overview and understanding of the performance over time. These reasons for reporting seem legitimate, therefore supporting the third hypothesis, i.e. disclosure for genuine differences, and making EN22 a significant indicator for the port sector. There are different reasons why some ports do not report on EN22. For the Port of Los Angeles, waste management is heavily regulated at national level so reporting on EN22 is not a priority as it goes without saying that the Port of Los Angeles is performing satisfactorily³². For the Port of Rotterdam, however, EN22 is not considered to be

³² This kind of reasoning goes in line with the idea of Gilbert et al. (2011), which posits that the emergence of sustainability reporting is related to the need to fill the gap in fields where binding regulations do not yet exist. Although this kind of reasoning makes sense, it does not fit the present idea of sustainability reporting and is not perceived as legitimate.

material, since the Port of Rotterdam is a service company. This brings us back to the issue of reporting boundaries. In addition, there are many aspects to take into account when it comes to waste management in a port. Consequently, the GRI indicators oriented towards waste management (namely EN22 and EN24) are rather limited when applied to the port sector. Various aspects found in ports' SRs will have to be considered when developing specific guidance for ports. For example, in the same way the Basel Convention is used under the GRI Guidelines, the MARPOL Convention can help to provide examples and draw up waste categories. Furthermore, the collection of vessel waste should be represented in the Sector Supplement, or the equivalent, and **discounted harbour due rate** for proper handling of waste has been identified as a potential indicator. All in all, EN22 could be kept for the development of a Sector Supplement, or the equivalent, but by specifying both the reporting boundaries and its link to MARPOL.

EN23 Total number and volume of significant spills: 5 ports out of the 13 (38%) identified as reporting on sustainability performance in accordance with the GRI Guidelines are using EN23 in their reports, which is a relatively low percentage. As for most of the indicators, ports that report on EN23 are doing so both to meet the requirements of GRI and to respond to stakeholder concerns. Unlike other indicators however, EN23 is also used by ports to provide managers with data for analyses of risks and opportunities. This last argument provided by ports for reporting on EN23 makes sense since spills, especially oil spills in water, can have irreversible effects. In addition, despite EN23's relatively low reporting score, spill issues are a topic covered by many ports not reporting in accordance with GRI. For example, Port Metro Vancouver reports on tanker safety, **oil spill preparedness and response regime**. The latest has been identified as a potentially new indicator. All in all, EN23 could therefore be kept for the development of a Sector Supplement, or the equivalent. However, it should be refined to port operations and include details on, for example, oil spills in the dock.

EN24 Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally: 3 ports out of the 13 (23%) identified as reporting on sustainability performance in accordance with the GRI framework are using EN24 in their reports. This score is relatively low and positions EN24 as one of the least reported of the GRI environmental indicators. Ports that report on this indicator are doing so to meet the GRI requirements, but also to respond to stakeholder concerns. In addition, the Port of Ferrol mentions, for EN24 only, that benchmarking is also a reason to report on this indicator³³. Those that do not report on EN24, i.e. the vast majority of ports, either do not state the reason why or declare this indicator is not applicable to their operations. The main issue with this indicator is that reporting on hazardous wastes transported by or on behalf of the reporting organisation is not feasible in the case of the port sector. A port does not ship on its behalf but is the place from where all the waste is shipped. The way the indicator is formulated is therefore not appropriate to the port sector. However, issues related to hazardous waste are of significance to the port sector, since hazardous waste is handled at the port area. Therefore, the indicator should be either set aside or reformulated in accordance with the needs of the port sector (cf. EN22).

EN25 Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organisation's discharges of water and runoff: 5 ports out of the 13 (38%) identified as reporting on sustainability performance in accordance with the GRI framework are using EN25 in their reports. This is an average

³³ Benchmarking is probably not possible on an international level, but is possible on a Spanish level, thanks to the indicators provided by Ports of the State. The two other Spanish ports under study, La Coruna (category 1) and Valencia Port (category 2), also report on this topic.

reporting rate, which does not confirm the findings of previous studies, e.g. Roca, that identify EN25 as one of the least reported indicators amongst companies. Like previous indicators, EN25 is being reported to both meet the requirements of GRI and to address stakeholder concerns. To some extent, ports also report on this indicator to meet legal requirements and/or pre-empt legally imposed requirements. These reasons for reporting seem understandable and legitimate, although they lead ports to report on EN25 in different ways. While some ports claim they have no records of water resources and habitats significantly affected by discharges of water and runoff, others link EN25 to water management or quality in the docks, for example, based on nutrients and priority substances. Although material, these differences demonstrate the need for clarification when this indicator is applied to the port sector.

5.2.6 Product and Services

With a 36% reporting rate, “Products and Services” comes sixth in the aspect category ranking. Comprising two main indicators, this aspect category is torn between the popularity of the first one, i.e. EN26, and the neglect of the second, i.e. EN27.

EN26 Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation: 8 ports out of the 13 (62%) identified as reporting on sustainability performance in accordance with the GRI Guidelines are using EN26 in their reports. The most oft-cited reasons why ports report on EN26 are: to provide managers with an overview and understanding over time, to respond to stakeholder concerns and to meet the requirements of GRI. Nonetheless, EN26 is mentioned, for example by the Port of Rotterdam, as not or less relevant than other indicators, although the port still reports on it. Interestingly, this indicator has also been identified as a benchmarking tool by Port Metro Vancouver. However, a few ports do not report on EN26 and the reasons for not disclosing information on this indicator are various. While the Port of Antwerp considers encompassing the whole port when reporting on EN26 too complex to be feasible, the Port of Los Angeles, as a landlord leasing property to tenants, does not see EN26 as highly relevant. When it comes to ports that are not reporting at all (category 3), i.e. Nigerian Port Authorities and the Independent Port of Strasbourg, both see the potential of using EN26 in their future SR, since it is relevant and linked to their activities. To conclude, it seems that besides its popularity amongst reporting ports, EN26 is also a tool to communicate with stakeholders and to help managers better grasp the topic. However, reporting on EN26 is complex for the port sector, since products and services within the port area usually involve thousands of companies. Consequently, this indicator could be kept for the development of a Sector Supplement, or the equivalent but should however be refined to ports operations.

EN27 Percentage of products sold and their packaging materials that are reclaimed by category: 1 port, i.e. the Port of Sines, out of the 13 (8%) identified as reporting on sustainability performance in accordance with the GRI framework uses EN27 in its reports. This score is the lowest obtained by any individual indicator. The Port of Sines mentioned that they report on this topic under G4, in order to respond to the requirements of GRI, but also because the indicator has been identified as material by the internal stakeholders. The Port of Sines however admits that EN27 is not related to its core business of providing services. Other ports - some of which also perform a materiality assessment - do not include EN27 for that exact reason: they are service providers and are therefore not selling any products. Therefore, the issue of reporting boundaries is raised, just as it is with EN26. However, while EN26 already reflects a relatively high degree of complexity, EN27 is even more complex, moving from qualitative to quantitative data. Amongst other things, this complexity might explain the poor reporting rate of EN27. Consequently, EN27 could be set aside for the development of a Sector Supplement, or the equivalent.

5.2.7 Compliance

EN28 Monetary value of significant fines and total number of non-monetary sanctions for noncompliance with environmental laws and regulations: 7 ports out of the 13 (54%) identified as reporting on sustainability performance in accordance with the GRI framework are using EN28 in their reports. Although this aspect only contains one indicator, i.e. EN28, it receives a relatively high score of disclosure, positioning the compliance category as the second highest reported aspect after Energy. This confirms Petrushevski (2014)'s findings in the oil and gas sector, which state that generally, all companies like to present some information on the compliance indicator. Ports reporting on EN28 are mainly doing so to respond to stakeholder concerns, but also to comply with the requirements of GRI. The Port of Rotterdam also uses EN28 to get an overview of performance over time, although it reports that no fines have been collected so far. On its side, the Port of Ferrol has legislation as a driver for disclosure. As for ports that are not reporting on EN28, the Port of Sines does not consider this indicator to be material and the Port of Antwerp does not have comprehensive data on the topic. Interestingly, the Valencia Port, which does not report in accordance with the GRI Guidelines (cf. category 2), borrows this EN28 indicator from GRI in its report. Valencia Port discloses this information mainly to comply with the GRI requirements (although it is not GRI certified) and to respond to stakeholder concerns. However, Valencia Port is not convinced of the importance of this indicator and might remove it for future reports. The other ports that are not reporting in accordance with GRI do not mention this topic.

To sum up, reporting on EN28 to comply with the GRI requirement seems less legitimate and comes closer to the second hypothesis: public relation impression. However, providing stakeholders with an answer to their concerns reasoning can support the third hypothesis, i.e. disclosure for genuine difference. In addition, EN28 represents the “bad performance side” and it is fundamental to include this information in a report so as not to forget that sustainability reporting is a balance between both the good and bad performances. Therefore, EN28 could be kept for the development of a Sector Supplement, or the equivalent.

5.2.8 Transport

EN29 Significant environmental impacts of transporting products and other goods and materials used for the organisation's operations, and transporting members of the workforce: only 3 ports out of the 13 (23%) reporting in accordance with GRI are reporting on this indicator, making the Transport aspect the least reported aspect by ports. Ports' reasons for reporting on EN29 vary from one port to another. While, for example, the Port of Rotterdam reports on EN29 to respond to external stakeholder concerns and to provide managers with an overview and understanding of the performance over time, the Port of Sines does so to meet the requirements of GRI and also because EN29 is material to internal stakeholders. As for ports that are not reporting on EN29, some, e.g. the Port of Antwerp, declare they do not have comprehensive data, while others, e.g. the Port of Ferrol, consider the indicator to not be applicable since they are service companies. To conclude this section, one can say that transport is definitely a relevant topic in the port sector and this topic has been noticed in all reports under analysis. However, EN29 is oriented towards transportation within the organisation, i.e. usually within the Port Authority, which is a service company. Transportation therefore usually lies with other companies, i.e. indirect transportation impacts. EN29 could be kept for the development of a Sector Supplement, or the equivalent, in the port sector but the reporting boundaries need to be specified. In addition, it seems that topics related to ship transport are also significant for the port sector. The Transport aspect category should therefore be adjusted towards what is really material to the port sector in this area, e.g. modal split, logistics, etc.

5.2.9 Overall

EN30 Total environmental protection expenditures and investments by type: 6 ports out of the 13 (46%) identified as reporting on sustainability performance in accordance with the GRI framework are using this last environmental indicator. Ports report on EN30 mainly to respond to stakeholder concerns. The Port of Sines specifies that reporting on EN30 is material to their internal stakeholders. This supports the third hypothesis: disclosure due to genuine difference. Other reasons to report on EN30 are to respond to the requirements of GRI and to provide managers with an overview and understanding of the performance over time. One can also observe that all the Spanish ports under study, i.e. the Port of Ferrol, the Port of La Coruna (category 1) and Valencia Port (category 2), report on environmental protection expenditures and investments. It can therefore be said that the disclosure of EN30 is also linked to contextual factors, e.g. national legislation. As for ports that are not reporting on EN30, the Port of Antwerp, for example, does not have comprehensive data available, which corresponds to the first hypothesis. On its side, the Port of Rotterdam reports on EN30 only partially since the investments amount is considered to be proprietary information. To summarise, although EN30 is not a reporting priority for certain ports and reporting on it is sometimes hard to implement, it seems to be a significant indicator for ports. Consequently, EN30 could be kept for the development of a Sector Supplement, or the equivalent.

To conclude the section, a few words will be addressed towards non GRI-G3 indicators that have not been covered yet: the indicators included in the new aspect categories added in the fourth generation of Guidelines, G4 (cf. Chapter 2). Firstly, **significant actual and potential negative environmental impacts in the supply chain and actions taken** (G4-EN33) is not used by ports reporting in accordance with G4. However, Valencia Port, which is not reporting in accordance with GRI, somewhat reports on this aspect category when explaining the substitution of conventional paper for paper from sustainable sources, certified by the Forest Stewardship Council (FSC). However, it concerns the use of paper at the port authority, which brings us directly back to the question of reporting boundary setting and how material this indicator is found by stakeholders.

Secondly, **number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms** (G4-EN34) is not reported by the Ports of Transnet and Sines, but the Port of Antwerp however does³⁴. The Port of Antwerp's reasons for disclosing information on EN34 are the following: to meet the GRI requirements and to respond to stakeholder concerns. This indicator has proven to be relevant also outside of the G4 Guidelines. Firstly, the Ports of La Coruna, Ferrol and Vancouver, which are still reporting in accordance with GRI G3, report on this indicator even though it is not included in the G3 Guidelines. Secondly, the same is true for ports that are not reporting in accordance with GRI. Within all these reports, sources of environmental damage in the port area were identified: mainly **odour, noise, reduced air quality** (from dust, soot smoke, etc.) but also soil, hazardous materials and water-related issues.

A table overview of this analysis is provided in Annex 10.

³⁴ The Port of Antwerp reports on this indicator by giving both the perception of the port by people living around the port area and the number of complaints registered.

6 Discussion

This chapter is a review of the methodological, theoretical and analytical choices selected to conduct the research. Further reflections are also provided on sustainability reporting and the GRI and the chapter is closed by a discussion on the generalisability of the findings.

6.1 Choice of Method

Firstly, the choice of using a questionnaire to gather the data will be discussed. Although the inclusion of the section “Other” enabled respondents to add further information, many ports’ managers felt restricted by the questionnaire form. To them, the reasons for reporting on sustainability reporting are too complex to be encompassed in a rigid questionnaire. This situation reflects both the shortcoming of questionnaires in general and the respondents’ desire to share more information on the matter. Although sometimes restricting for respondents, the questionnaire has enabled this study to set clear reporting boundaries. A few comments can also be made on the propositions suggested in the questionnaire. For example, the formulation of the proposition “To greet the port’s unique situation” caused some confusion amongst respondents. The meaning was therefore specified to inquiring respondents and adjusted for the following communications. Still in the context of questionnaire propositions, Metro Port of Vancouver proposed two other options to be included: *significance to stakeholders* and *significance to organisation*. These two elements have been proven to be relevant for other ports too. This therefore illustrates the quick evolution of the field and shows that the body of literature is somewhat outdated.

One last point that should be addressed in the discussion pertaining to the questionnaire is the composition of the respondents towards which it was oriented. The questionnaire was addressed to the managers of sustainability departments - or the equivalent - involved in each company’s reporting process. Consequently, the study reports the perception of these 12 individuals and any consideration of the findings can solely be attributed to them. In addition, relying on a questionnaire also raises the issue of whether respondents actually communicated honest answers. In this specific case, there is a risk that managers tried to portray their companies in a positive way, therefore not mentioning (1) the non-materiality of certain indicators reported and (2) the materiality of omitted indicators. However, that is a topic for a different paper, and the present study here takes the position that respondents communicated the real situation to the best of their abilities.

Secondly, scoring systems in the field of reporting have also been subject to discussion. Scoring systems usually evaluate SR based on the items reported rather than on the quality of sustainability performance. Consequently, sustainability benign companies with no real reasons to report certain topics will end up with low score if they restrict themselves only to indicators material to them. Similarly, any company willing to increase its score can do so by adding indicators, regardless of performance (Morhardt et al., 2002). The author tries to overcome this limitation by (1) focusing on the indicators score as opposed to the companies’ scores and (2) distinguishing material indicators for the port sector as opposed to indicators disclosed to please GRI or to increase a port’s score. Thirdly, in terms of scope, the present study analyses the environmental indicators only. However, the three pillars of sustainability overlap and the same is true in the context of sustainability reporting. Although the author also read through the economic and social parts of companies’ SRs, this study’s focus on environmental indicators could have led to the omission of certain indicators. If a study of bigger scale were undertaken, it would be advisable to encompass all three pillars at one time.

6.2 Choice of Theory

The choice of theory to gather and analyse the findings will also be discussed at length. Stakeholder theory has been widely used in the field of organisational management and business ethics. Although present in the literature of sustainability reporting, its use has been limited so far. Similarly, studies supporting Stakeholder theory as an explanatory factor of disclosure are rare. Rather, the main body of literature has emphasised the great influence of the legitimacy theory. Going against the tide and choosing the Stakeholder theory has enabled this study to explore another perspective and therefore to widen the scope of the Stakeholder theory in the literature. However, it has also restricted the study to this perspective, even though more than one theory explains the rationale behind sustainability reporting. In addition, Stakeholder theory has helped enhance the understanding of the present situation of sustainability reporting in the port sector (first research question), but has not provided a clearly defined framework enabling the inclusion or omission of environmental indicators.

6.3 Reflection on sustainability reporting and GRI

A discussion on the legitimacy of sustainability reporting is also of utmost importance. The present study has taken for granted that the practice of sustainability reporting is a good and legitimate practice. However, sustainability reporting does not necessarily mean environmental changes and honest practices. Many scholars have highlighted this darker side of sustainability reporting and the discussion is still a topical issue. Reflecting on the criticisms addressed at sustainability reporting in the present literature review section has led to an acknowledgement of the existing problems related to SRs. In addition, the methodology – in particular the questionnaire – highlights the desire to avoid these issues and this study recommends leaving aside indicators with illegitimate reasons for disclosure. Furthermore, the way society looks at sustainability reporting is likely to change, since disclosure of sustainability and environmental performance is becoming mandatory in many parts of the world. This might consequently bring a different perspective to an examination of the present study.

The present study acknowledges that GRI's framework is the legitimate path to take. However, like sustainability reporting, GRI is also confronted with criticisms. Many companies have abused the use of certain GRI indicators in order to establish a positive reporting profile, regardless of the materiality of said indicators to their operations. This problem is dealt with by the new G4 guidelines and their emphasis on materiality. Under G4, companies disclose information only on issues that matter to them. However, this new generation of Guidelines raises questions related to the future of sectorial guidance, which also highlights what is material for sectors. Despite the potential end of sector guidance, this study finds that the G4 guidelines and the sector supplements are two distinct tools in terms of approach. While the G4 guidelines are a thought process, i.e. G4 requires companies to undertake a materiality assessment, sector supplements are rule-based, providing a list of material topics. In general, companies are looking for a less-time consuming rule-based framework, i.e. sector supplements.

6.4 Reflection on the generalizability of this study

To conclude, a few words are addressed to the generalisability of the findings. Through both the literature review and direct contact with ports, it has been observed that differences, e.g. size, type, location, etc., are framing the way ports report on sustainability issues. However, the same issues are still relevant to all ports due to their many similarities. Therefore, this study recommends that the port sector create a common reporting framework. The present study consequently seeks to be generalisable to the whole port sector.

7 Conclusion

There has been an increasing trend in corporate sustainability performance over time. Likewise, voluntary and public disclosures of these issues are on the rise and are summarised under the practice of sustainability reporting. The current prominent and legitimate guidelines framing companies' sustainability reporting practices are proposed by the Global Reporting Initiative (GRI). The GRI provides generic guidelines valid for all types of companies, but it has also developed Sector Supplements, allowing sectors to report in accordance with their specific needs. However, such a sector supplement has not yet been developed for the port sector. The port sector is nevertheless growing and therefore has an increasing impact on the economy, society and the environment. Consequently, the port sector has need for sustainability reporting. Therefore, the World Association for Waterborne Transport and Infrastructure (PIANC) and the International Association of Ports and Harbours (IAPH) has set up a working group (WG174) to take the lead in creating sustainability reporting guidelines for the port sector. The present research hopes to provide a basis for the first workshop of the WG174, which will take place in October 2014. In order to do so, this thesis examined the environmental aspect of sustainability reporting in the port sector, analysed the rationale behind each disclosure of environmental indicators, and interpreted the results based on a Stakeholder theory framework. This chapter recapitulates these steps under the gap analysis, as a way to offer an overview of (1) the current situation, (2) the future targeted state and (3) the steps to be taken in order to bridge the gap between (1) and (2).

7.1 Current situation – “Where are we?”

The first step of the gap analysis is linked to the first research question (RQ1):

“What does ports’ environmental reporting look like within - or outside - the GRI Guidelines and what is the rationale behind ports’ environmental disclosure?”

The port sector encompasses different reporting styles. Some ports are reporting in accordance with the GRI framework either under G3 or G4, others are not reporting in accordance with GRI and some ports are not reporting at all. In addition, although the term Sustainability Report (SR) has been used throughout the whole thesis, the names referring to these reports are different. Mostly they can be found as separate reports, but disclosures of sustainability performance have also been found integrated within annual reports. Furthermore, ports do not set their reporting boundaries similarly: some report on the port authority, others on the port area and still others on both. Although these reports can provide each port individually with a tool enabling internal organisational change, different reporting boundaries do not allow for benchmarking. Finally, differences can be found in the indicators disclosed by ports. However, the common trend is to report on areas related to energy, emissions and compliance. Amongst the ports reporting in accordance with GRI, the identified most and least frequently reported environmental indicators are presented in Table 23.

Table 23 Identified Most and least frequently reported GRI environmental indicators in the port sector identified with a binary scoring method

MOST FREQUENTLY REPORTED INDICATORS	LEAST FREQUENTLY REPORTED INDICATORS
EN3 - Direct energy consumption by primary energy source	EN2 - Percentage of materials used that are recycled input materials
EN16 - Total direct and indirect greenhouse gas emissions by weight	EN19 - Emissions of ozone-depleting substances by weight
EN22 - Total weight of waste by type and disposal method	EN27 - Percentage of products sold and their packaging materials that are reclaimed by category

While some indicators are either fully present or completely excluded, other environmental indicators provide a less straightforward picture. Many indicators are situated in between these two extremes, as they are sometimes reported by ports but with no obvious consistency. Knowing which indicators from the GRI Guidelines should be included in the Sector Supplement, or the equivalent, and which should be left out, therefore requires understanding the factors driving environmental disclosure in the port sector. This leads us straight to the second part of the RQ1:

(...) what is the rationale behind ports' environmental disclosure?

To address this question, questionnaires were sent to ports in order to understand the reasons behind each environmental disclosure. Concretely, a GRI indicator is considered to have potential for a port Sector Supplement, or the equivalent, if it is identified as being reported for material reasons. Materiality refers to the fact that information found in reports should cover indicators that reflect the organisation's significant economic, environmental and social impacts or that would influence the evaluation and decisions of stakeholders (GRI, 2013a). The Stakeholder theory was therefore used as a framework for the selection of material indicators. Amongst ports reporting in accordance with GRI, the top-3 most often cited responses for reporting on an environmental indicator are (1) To meet the requirements of GRI, (2) To respond to stakeholder concerns and (3) To provide managers with an overview and understanding of the performance over time. The first reason has rarely been mentioned on its own, which legitimises the use of this reason. Overall, the findings obtained suggest that the practice of environmental reporting – at least in the port sector - has moved away from an old-fashioned way of environmental reporting reasoning. Although other theories, such as the legitimacy theory, will always be explanatory components of sustainability reporting, this study supports and emphasises the Stakeholder theory. More specifically, sustainability reporting has been identified primarily as a tool to respond to the needs of the port authority's specific stakeholders.

7.2 Targeted state – “Where do we want to be?”

During the exchanges with ports, it has been noted that there is a need for benchmarking, which further supports the idea of developing a Sector Supplement, or the equivalent. This researcher therefore suggests that the targeted state should be the development of such a Sector Supplement, and provides recommendations regarding the development of environmental indicators. Based on the GRI G3.1 Guidelines, the outcome of this study is a set of four categories of environmental indicators: G3.1 Environmental indicators that can be set aside (1), kept intact (2) or refined to port operations (3), as well as non-G3.1 environmental indicators identified as material (4) for the development of a port Sector Supplement, or the equivalent. Table 24 further detailed the fourth category and a detailed overview of these four categories is provided in Annex 10.

For most indicators, a decision has to be made on the reporting boundaries, i.e. whether to report on the port authority or to extend the effort to the whole port area. The latter is here advised for two main reasons: (1) ports disclose information mainly to respond to stakeholders concerns and stakeholders want to obtain information on the impacts of the whole port area and (2) GRI advises extending the reporting boundaries to operations that port authorities do not necessarily have operational control over, i.e. companies operating at the port area.

Table 24 Category 4: Non- G3.1 environmental indicators identified as material for the port sector in the context of developing a Sector Supplement, or the equivalent.

	Aspects	Potential additional indicators
G3.1's Aspects	WATER	Water quality
	BIODIVERSITY	Compensation area
	EMISSIONS	GHG emission intensity (G4-EN18) Air quality (to be linked with EN20) Initiatives to (1) provide vessels with low sulphur marine fuel or alternative and (2) incentivise low sulphur emitters (e.g. discounted harbour due rate and associated awards) - (to be linked with EN16)
	EFFLUENTS	Initiatives related to spills preparedness and response
	WASTE	Discounted harbour due rate for waste
	OVERALL	Level of implementation of the EMS
	GRIEVANCE	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms (G4-EN34). To be adapted to the port sector, i.e. to cover noise, odour and air quality.
SOIL AND GROUNDWATER	Soil quality Sediment quality	

7.3 Recommendations – “How to bridge the gap?”

The third step of the gap analysis is linked to the second research question (RQ2):

How can ports both improve and harmonise their sustainability reporting?

Ports can improve and harmonise their reporting performance by developing a Sector Supplement, or the equivalent. The PIANC and IAPH working group can use the present results to help inform the development of sector specific indicators. Over time, indicators could be consolidated and the use of the GRI Guidelines further refined. Given the increasing growth in the application of the GRI Guidelines, utilising GRI Guidelines is considered interesting. Concretely, Table 25 gathers information for developing such guidelines for ports.

Table 25 Potentially valuable information for developing a port Sector Supplement, or the equivalent.

POTENTIALLY VALUABLE INFORMATION	CF.
Existing initiatives in the port sector	Section 2.2.2, Sustainability reporting for ports
Advice from GRI to the port sector	Section 4.2, Lessons learned from GRI
A first round of information on the GRI environmental indicators and their analyses	Section 5.2, GRI's aspects in light of theory
List of potential additional indicators	Section 7.2, Targeted state –“Where do we want to be”

This study gathers up-to-date information on the current state of sustainability reporting in the port sector, which could also be of use for any ports in need of benchmarking or of information to help them decide on the future of sustainability reporting within their organisation. Furthermore, this thesis contributes to the literature on sustainability reporting. It widens the scope of Stakeholder theory and provides explanation for the disclosure of each environmental indicator, as opposed to the reasons for reporting in general. For the first time in this field, it analyses the reporting practices within the port sector. Based on the results of this study, some future research directions are suggested. Firstly, looking into the quantification of each indicator under the present study could be of interest. Secondly, investigating the two other pillars of sustainability reporting, i.e. economic and social, could act complementarily to these findings and therefore help the port sector further harmonise its reporting practices.

8 Bibliography

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9 Appendix

Annex 1. Questionnaire designed, the case of the Port of Los Angeles reporting in accordance with GRI

Port of Los Angeles – Environmental Indicators

This questionnaire and follow-up questions are part of a master thesis research undertaken at Lund University, Sweden, and aim to contribute to the development of sustainability indicators in the port sector. However, the questions here address the environmental indicators (EN) only, with a focus on the GRI framework. The questionnaire was developed based on the port of Los Angeles’ Sustainability Report (July 2011 – June 201). Please answer to Part 1 and 2 by checking the box when it is appropriate. Also, note that more than one answer can be selected. In part 3, your input is required in oral or written form during Skype or phone meeting. Thank you for your participation.

PART 1: GRI EN – Indicators reported by the port of Los Angeles

Indicators	Reasons for reporting on each indicator
EN3 - Direct energy consumption by primary energy source	<input type="checkbox"/> To greet the port of Los Angeles’ unique (geographical, political, etc.) situation <input type="checkbox"/> To emphasize an area where the port of Los Angeles performs particularly well <input type="checkbox"/> To meet legal obligations and/or pre-empt legally imposed requirements <input type="checkbox"/> To meet the requirements of GRI <input type="checkbox"/> To satisfy “due diligence” requirements <input type="checkbox"/> To respond to stakeholder concerns, please specify: community, financial institutions, suppliers, customers, environmental lobby groups, shareholders / investors Cliquez ici pour taper du texte. <input type="checkbox"/> Due to competitor response to environmental issues <input type="checkbox"/> Due to an easy access to data regarding this indicator <input type="checkbox"/> To provide managers with an overview and understanding of the performance over time <input type="checkbox"/> To provide managers with data for analyses of risks and opportunities <input type="checkbox"/> To provide managers with data allowing benchmarking with other ports <input type="checkbox"/> Other (specify): Cliquez ici pour taper du texte.
EN13 - Habitat protected or re-stored	<input type="checkbox"/> To greet the port of Los Angeles’ unique (geographical, political, etc.) situation <input type="checkbox"/> To emphasize an area where the port of Los Angeles performs particularly well <input type="checkbox"/> To meet legal obligations and/or pre-empt legally imposed requirements <input type="checkbox"/> To meet the requirements of GRI <input type="checkbox"/> To satisfy “due diligence” requirements <input type="checkbox"/> To respond to stakeholder concerns, please specify: community, financial institutions, suppliers, customers, environmental lobby groups, shareholders / investors Cliquez ici pour taper du texte. <input type="checkbox"/> Due to competitor response to environmental issues <input type="checkbox"/> Due to an easy access to data regarding this indicator <input type="checkbox"/> To provide managers with an overview and understanding of the performance over time <input type="checkbox"/> To provide managers with data for analyses of risks and opportunities <input type="checkbox"/> To provide managers with data allowing benchmarking with other ports <input type="checkbox"/> Other (specify): Cliquez ici pour taper du texte.
EN14 - Strategies, current actions, and future plans	<input type="checkbox"/> To greet the port of Los Angeles’ unique (geographical, political, etc.) situation <input type="checkbox"/> To emphasize an area where the port of Los Angeles performs particularly well <input type="checkbox"/> To meet legal obligations and/or pre-empt legally imposed requirements

<p>for managing impacts on biodiversity</p>	<ul style="list-style-type: none"> <input type="checkbox"/> To meet the requirements of GRI <input type="checkbox"/> To satisfy “due diligence” requirements <input type="checkbox"/> To respond to stakeholder concerns, please specify: community, financial institutions, suppliers, customers, environmental lobby groups, shareholders / investors Cliquez ici pour taper du texte. <input type="checkbox"/> Due to competitor response to environmental issues <input type="checkbox"/> Due to an easy access to data regarding this indicator <input type="checkbox"/> To provide managers with an overview and understanding of the performance over time <input type="checkbox"/> To provide managers with data for analyses of risks and opportunities <input type="checkbox"/> To provide managers with data allowing benchmarking with other ports <input type="checkbox"/> Other (specify): Cliquez ici pour taper du texte.
<p>EN16 - Total direct and indirect greenhouse gas emissions by weight</p>	<ul style="list-style-type: none"> <input type="checkbox"/> To greet the port of Los Angeles’ unique (geographical, political, etc.) situation <input type="checkbox"/> To emphasize an area where the port of Los Angeles performs particularly well <input type="checkbox"/> To meet legal obligations and/or pre-empt legally imposed requirements <input type="checkbox"/> To meet the requirements of GRI <input type="checkbox"/> To satisfy “due diligence” requirements <input type="checkbox"/> To respond to stakeholder concerns, please specify: community, financial institutions, suppliers, customers, environmental lobby groups, shareholders / investors Cliquez ici pour taper du texte. <input type="checkbox"/> Due to competitor response to environmental issues <input type="checkbox"/> Due to an easy access to data regarding this indicator <input type="checkbox"/> To provide managers with an overview and understanding of the performance over time <input type="checkbox"/> To provide managers with data for analyses of risks and opportunities <input type="checkbox"/> To provide managers with data allowing benchmarking with other ports <input type="checkbox"/> Other (specify): Cliquez ici pour taper du texte.
<p>EN18 - Initiatives to reduce greenhouse gas emissions and reductions achieved</p>	<ul style="list-style-type: none"> <input type="checkbox"/> To greet the port of Los Angeles’ unique (geographical, political, etc.) situation <input type="checkbox"/> To emphasize an area where the port of Los Angeles performs particularly well <input type="checkbox"/> To meet legal obligations and/or pre-empt legally imposed requirements <input type="checkbox"/> To meet the requirements of GRI <input type="checkbox"/> To satisfy “due diligence” requirements <input type="checkbox"/> To respond to stakeholder concerns, please specify: community, financial institutions, suppliers, customers, environmental lobby groups, shareholders / investors Cliquez ici pour taper du texte. <input type="checkbox"/> Due to competitor response to environmental issues <input type="checkbox"/> Due to an easy access to data regarding this indicator <input type="checkbox"/> To provide managers with an overview and understanding of the performance over time <input type="checkbox"/> To provide managers with data for analyses of risks and opportunities <input type="checkbox"/> To provide managers with data allowing benchmarking with other ports <input type="checkbox"/> Other (specify): Cliquez ici pour taper du texte.
<p>EN20 - NO_x, SO_x, and other significant air emissions by type and weight</p>	<ul style="list-style-type: none"> <input type="checkbox"/> To greet the port of Los Angeles’ unique (geographical, political, etc.) situation <input type="checkbox"/> To emphasize an area where the port of Los Angeles performs particularly well <input type="checkbox"/> To meet legal obligations and/or pre-empt legally imposed requirements <input type="checkbox"/> To meet the requirements of GRI <input type="checkbox"/> To satisfy “due diligence” requirements <input type="checkbox"/> To respond to stakeholder concerns, please specify: community, financial institutions, suppliers, customers, environmental lobby groups, shareholders / investors Cliquez ici pour taper du texte. <input type="checkbox"/> Due to competitor response to environmental issues <input type="checkbox"/> Due to an easy access to data regarding this indicator <input type="checkbox"/> To provide managers with an overview and understanding of the performance over time

<input type="checkbox"/> To provide managers with data for analyses of risks and opportunities <input type="checkbox"/> To provide managers with data allowing benchmarking with other ports <input type="checkbox"/> Other (specify): Cliquez ici pour taper du texte.

PART 2: GRI EN – Indicators not reported by the port of Los Angeles

Indicators	Justification for not reporting on certain GRI indicators	Can you see any other reason for not reporting on certain indicators?
EN4 - Indirect energy consumption by primary source	No justification found	<input type="checkbox"/> There is no demand from us to report on these indicators <input type="checkbox"/> There is no demand from outside to report on these indicators <input type="checkbox"/> We do not currently have adequate expertise or resources for them <input type="checkbox"/> It is not necessary for our industry, i.e material <input type="checkbox"/> None of our competitors are reporting on them <input type="checkbox"/> It is too costly to report on these indicators <input type="checkbox"/> It is too time-consuming <input type="checkbox"/> We have nothing to report on these topics <input type="checkbox"/> It was a management decision not to report on them <input type="checkbox"/> Other (specify): Cliquez ici pour taper du texte.
EN22 - Total weight of waste by type and disposal method	No justification found	<input type="checkbox"/> There is no demand from us to report on these indicators <input type="checkbox"/> There is no demand from outside to report on these indicators <input type="checkbox"/> We do not currently have adequate expertise or resources for them <input type="checkbox"/> It is not necessary for our industry, i.e material <input type="checkbox"/> None of our competitors are reporting on them <input type="checkbox"/> It is too costly to report on these indicators <input type="checkbox"/> It is too time-consuming <input type="checkbox"/> We have nothing to report on these topics <input type="checkbox"/> It was a management decision not to report on them <input type="checkbox"/> Other (specify): Cliquez ici pour taper du texte.
EN26 - Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation	No justification found	<input type="checkbox"/> There is no demand from us to report on these indicators <input type="checkbox"/> There is no demand from outside to report on these indicators <input type="checkbox"/> We do not currently have adequate expertise or resources for them <input type="checkbox"/> It is not necessary for our industry, i.e material <input type="checkbox"/> None of our competitors are reporting on them <input type="checkbox"/> It is too costly to report on these indicators <input type="checkbox"/> It is too time-consuming <input type="checkbox"/> We have nothing to report on these topics <input type="checkbox"/> It was a management decision not to report on them <input type="checkbox"/> Other (specify): Cliquez ici pour taper du texte.

PART 3: Identification of potential missing indicators in the GRI framework

Open discussion on potential missing EN indicators within the GRI framework, e.g. environmental-related issues that you are reporting on but do not fit the GRI framework Cliquez ici pour taper du texte.

Annex 2. Ports under analysis which are reporting on sustainability, with corresponding reporting body and ownership information

Ports	Reporters	Ownership (reporters)
Port of Antwerp	Antwerp Port Authority	Municipally-owned company
Port of Ferrol	Autoridad Portuaria de Ferrol (Port authority)	State-owned company
Port of Los Angeles	Port of Los Angeles (Port Authority)	City-owned company
Port of Rotterdam	Port of Rotterdam Authority	Company jointly-owned by the municipality and the state
Port of Sines	Administração dos Portos de Sines e do Algarve (Port Authority)	State-owned company
Port of Vancouver	Metro Port Vancouver (Port Authority)	State-owned company
Groningen Seaports	Groningen Seaports	Company jointly-owned by the municipality and the state
Valencia Port	Port Authority of Valencia	State-owned company
Port of Ghent	Ghent Port Company (Port Authority)	Autonomous municipal port company
Port of Gothenburg	Gothenburg Port Authority	City-owned company

Annex 3. Ports identified as reporting in accordance with the GRI Guidelines as of July 2014

	PORT	COUNTRY	REGION	PIANC*	version	Level	year	Language	Name of the report
1	Antwerp	Belgium	Europe	YES	G4	n/a	2012	Dutch, English	Sustainability report
2	Rotterdam	The Netherlands	Europe	YES	G3.1	A+	2013	Dutch	Annual report
3	Vancouver	Canada	North America	NO	G3.1	B+	2013	English	Sustainability report
4	La Coruna	Spain	Europe	NO	G3.1	A+	2012	Spanish, English	Sustainability report
5	Santa Marta	Colombia	South America	NO	G3.1	B	2011	Spanish	Sustainability report
6	Transnet	South-Africa	Africa	YES	G4	n/a	2014	English	Sustainability report
7	Stockholm	Sweden	Europe	NO	G3	C	2013	Swedish, English	Annual report
8	Los Angeles	United States	North America	NO	G3.1	C	2011-2013	English	Sustainability report
9	Dubai	United Arab Emirates	Asia	NO	G3.1	I	2012	English	Sustainability report
10	Ferrol	Spain	Europe	YES	G3.1	A	2012	Spanish	Sustainability report
11	Sines	Portugal	Europe	NO	G4	n/a	2013	Portuguese	Sustainability report
12	Bremen	Germany	Europe	YES	G3.1	B+	2012	German	Sustainability report
13	Tianjin	China	Asia	NO	G3	I	2013	Chinese	CSR Report

*Have been taking part in the PIANC WG150 on Sustainable Ports
Note: other ports have been identified as reporting in accordance with the GRI Guidelines in the past, such as the ports of Auckland (2010), Brisbane (2008/2009, 2009/2010) and Lisbon (2007, 2008)

Annex 4. INDAPORT: twenty-one port activities, seventeen environmental indicators and their associated potential environmental impacts

Source: E. Peris-Mora et al. / *Marine Pollution Bulletin* 50 (2005) 1649-1660.

Potential environment impacts	Environmental indicators	
<i>Air pollution</i>		
Emission of particles from storage, loading and unloading of bulk solids	1. Air quality (atmospheric contaminant emissions: CO, NO _x , SO, O, PM10)	
Emission of combustible gasses OC, NO _x , SO ₂ and HC from vehicular traffic on land		
Emission of particles from the handling and transformation of bulk solids	2. Atmospheric contaminant emissions: VOCs and particles	
Emission of VOCs in loading and unloading combustible materials in activities with oil products		
Emission of VOCs in storage tanks from oil product activity		
Emission of combustible gasses CO, NO _x , SO ₂ and HC from maritime traffic		
Emission of combustible gasses CO, NO _x , SO ₂ and HC from loading and unloading machines (cranes, water spouts, ramps, etc.) for containerised merchandise	3. Gas emissions with Greenhouse effect (CO ₂ , CH ₄ , N ₂ O)	
Emission of other gasses which are harmful for human health and/or the environment (VOCs) in building and repairing vessels		
Emission of particles from civil works		
Emission of particles from vehicular land traffic	4. Noise pollution	
Emission of particles from handling general containerised merchandise		
Emission of particles from building and repairing vessels		
<i>Noise pollution</i>		
Noise caused by land traffic	4. Noise pollution	
Noise caused by container loading and unloading machinery		
Noise caused by civil works machinery		
Noise caused by vessel construction and repairing machinery		
<i>Odour pollution</i>		
Odours from handling and transforming perishable bulk solids	5. Inner port water quality	
Odours from MARPOL V waste treatment		
Odours from fish handling		
Odours from water purifiers		
<i>Water pollution</i>		
Spills or leaks from the transfer of oil products from vessel to lorry	5. Inner port water quality	
Spills or leaks from the transfer of bulk liquids from vessel to lorry		
Accidental spills from small vessels in maritime traffic	6. Amount and description of accidental spills in inner port waters	
Change in normal dock water conditions in dredging operations		
Rainwater in bulk storage areas	7. Quality of spilled waste water	
Processed water—with organic waste from fish cleaning		
<i>Soil pollution</i>		
Spills or leaks of dangerous liquids (HC, paints, solvents, oils) from land traffic	8. High risk areas for soil pollution	
Spills or leaks of dangerous liquids (HC, paints, solvents, oils) from construction and vessel repair		
Spills or leaks of dangerous liquids (HC, paints, solvents, oils) in the MARPOL waste treatment		
Leached material from storage of waste from fishing activities		
Leached material from storage of stock	9. Urban and dangerous waste creation	
<i>Waste creation</i>		
Urban waste		
Uncontaminated sludge from dredging		
Scrap from building and repair of vessels		
Non-organic waste: tyres in general containerized merchandise		
Scrap from civil works		
General organic waste from the handling of bulk solids		
Non-organic waste: tyres in port services		
Excesses from bulk solids stock		
<i>Dangerous waste</i>		
Material impregnated with dangerous chemical substances and preparations		
Batteries and fluorescent tubes		
Toxic waste packaging from building and repairing vessels (lubricants, solvents paint, anti-fouling, etc.)		
Toxic waste packaging in marinas (lubricants, solvents, paint, anti-fouling, etc.)		
Chemical preparations and organic solvents used in bulk solid activity		

Contaminated sludge from dredging Sludge with hydrocarbons from MARPOL waste treatment	10. Creation of sludge from dredging
<i>Resource consumption</i> Consumption of processed water in the manipulation and transformation of perishable bulk solids Water consumption in cleaning and maintaining green areas Water consumption in watering carbon heaps when handling bulk solids Water consumption in cleaning and maintaining crafts in marinas	11. Efficient water consumption
Fuel consumption in land traffic Fuel consumption in machinery used for the storage, loading and unloading of containerised merchandise Fuel consumption in machinery used for building and repairing vessels	12. Efficient fuel consumption
Electric energy consumption in the storage, loading and unloading of containerised bulk solids Electric energy consumption in the storage, loading and unloading of non-containerised bulk solids Electric energy consumption in the storage, loading and unloading of non-containerised merchandise Electric energy consumption the handling and pumping of oil-based derived products Electric energy consumption in the handling and pumping of bulk liquids	13. Efficient electric energy consumption
<i>Other</i> Alteration of water currents due to the existence of the port, accretion and erosion phenomena Alteration of sea floor due to civil works Alteration of sea floor due to dredging operations Alteration of sea floor at the mooring areas for boats	14. Alteration of sea floor
Occupation of soil due to civil works Impact on landscape and installations that are abandoned or out of use	15. Soil occupation efficiency
	16. Social image of the port
	17. Number of incidents with environmental repercussions

Annex 5. Environmental indicators developed under MESOSPORT

Source: Translated and adapted from FEPORTS

Environmental indicators	Correlation with GRI
A 1. Materials used by weight or volume	EN1
A 2. Percentage of materials used that are recycled input materials	EN2
A 3. Direct energy consumption by primary source	EN3
A 4. Indirect energy consumption by primary source	EN4
A 5. Total water withdrawal by source	EN8
A 6. Description of the operations that are performed within or surrounding natural areas or protected areas of high biodiversity	EN11
A 7. Description of key impacts of port activity that occur on protected natural areas or areas of high biodiversity	EN12
A 8. Total direct and indirect emissions of greenhouse gases, by weight	EN16
A 9. Other indirect emissions of greenhouse gases by weight	EN17
A 10. Emissions of substances that destroy the ozone layer, by weight	EN19
A 11. Type and number of other significant emissions from the activities of the Port Authority	EN20
A 12. Total waste water discharge by quality and destination	EN21
A 13. Total weight of managed waste by type and disposal method	EN22
A 14. Total number and volume of significant spills	EN23
A 15. Initiatives to mitigate environmental impacts of the activity of the AP	EN26
A 16. Percentage of products sold and their packaging materials that are reclaimed at the end of its useful life by product category	EN27
A 17. Cost of significant fines and number of non-monetary sanctions for breach of environmental regulations	EN28

Annex 6. Final list of environmental indicators developed under PPRISM

Source: ESPO

Quantitative measure

Total energy consumed

Carbon footprint

Total water consumption

Amount of waste

Qualitative measure

EMS standard

Existence of aspects inventory

Existence of monitoring programme

Annex 7. Record of the meeting between GRI and the Port sector, June 24th 2014

*GRI headquarter, Amsterdam
24th of June, 2014*

Attendees: GRI representatives, the Port of Antwerp, the Port of Rotterdam and the Port of Ferrol

Subject: Sector guidelines for the port sector

The discussion was based on (1) what are the port sector's current situation and needs in terms of sustainability reporting, (2) what are the current initiatives undertaken by the port sector in order to address these needs and (3) what are GRI's previous, current and intended future initiatives regarding sustainability for sectors. Details on these three main bases of discussion are further explained below.

- (1) The current situation of port sustainability reporting was first discussed. According to the ports present, there are nowadays approximately 15 ports reporting in accordance with GRI. When it comes to the number of ports reporting without the GRI framework, the intuition is that even if some ports do not have a SR, most ports do report somehow, either through an annual report or a website, etc. According to the port sector, the reasons why some ports do not report in accordance with GRI are twofold. Firstly, it is a really heavy document to digest, which makes the implementation process quite long and demanding. Secondly, with the GRI G3 guidelines, the omission of each indicator had to be justified. However, it has been noted that many ports which are not using GRI framework, actually follow its way of reporting. In addition to a discussion on the current trends, the issue of ports' needs in terms of sector guidance was raised and set the basis for the ensuing discussion. Some examples of the GRI Framework reaching its limit when applying to the port sector were given.
- (2) Several initiatives resulting from the need to develop sector guidance for ports were mentioned. For example, PIANC's working group's focus on sustainability reporting was introduced. The ambition of this working group to develop a sector supplement, or the equivalent, was further discussed. For PIANC, seeking GRI's advice is a way to pass through a legitimised path. A second example was also mentioned- the set of indicators developed by and for the Spanish ports. These two initiatives are further detailed in the section devoted to the port sector's initiatives (cf. Chapter 2).
- (3) GRI's previous work in collaboration with sectors was presented and discussed. Both the development and use of the Sector Supplements and the Topic for Sectors research were highlighted (cf. Chapter 2, background information). GRI's future intentions towards sector guidance work are under development. Indeed, with the fourth generation of guidelines, G4, GRI has put the sector supplements on hold and is now reflecting on how they will deal with the sector supplements in the future. The G4 Guidelines emphasise the concept of materiality and organisations are therefore encouraged to report on what actually matters to their organisation, or to their sector. Furthermore, deciding how to deal with sector supplements is a strategic decision for GRI since it will determine what GRI will be, i.e. does GRI want to specialise even more in sector work or should the GRI stay a generic framework applicable for all? Moreover, the emergence of the framework SASB³⁵, which adopts a narrower perspective than GRI, adds to the importance of the strategic positioning that GRI will have to take.

³⁵ SASB is a framework for stock listed organisation adopting a narrower perspective, in opposition to the GRI Guidelines.

Since GRI's strategy in terms of sector supplements is not clearly defined yet, the port sector was encouraged to go ahead with the development of "its own sector supplement". However, GRI was willing to provide insight, and the two parties at the meeting launched a discussion on how the port sector could best develop these guidelines. The outcome of this discussion can be summarised as follows. Firstly, the development of a handbook for the port sector emerged as the best potential way to move forward in the current context. After identifying impacts and topics missing in G4, this handbook could be developed to complement G4. Although GRI cannot help with the creation of the guidelines, they can help with awareness. GRI drew up some action points to support the port sector in the handbook development. For example, GRI will contribute to the PIANC's next workshop in October 2014, share information based on its experience; help the port sector find a moderator and establish collaboration for the development of the handbook, etc. Secondly, the question was raised whether ports should report on the sustainability performance of the port authority's activities or on those of the whole port area. According to GRI, it makes more sense to report on the whole area. In G4, one of the recommendations is to report on both the impacts that are under and beyond the control of the organisation. Ports could simply state that they do not have control over some activities on which they report. Thirdly, the composition of the PIANC working group was discussed. It is currently mainly composed of employees from various port authorities. Although the working group seems to be geographically representative, GRI advised extending the working group to various port stakeholders. In addition to bringing in potential new perspectives, having an end-result with stakeholders involved would make the guidelines less vulnerable to criticism than if it was only developed by business, i.e. by port authorities.

To sum up, the meeting enabled both parties, i.e. GRI and the port sector, to get an updated overview of what the current situation, priorities and intentions are on each side. It seems that the future of GRI sustainability reporting in the port sector will highly depend on the PIANC working group rather than on GRI.

Annex 8. Record of the first Skype interview with GRI representative: what can be learned from Sector Supplement and Topic for Sector and what are the recommendations for the port sector?

Date: 16th of July, 2014

Interviewee: Tamara Bergkamp, Manager Reporting Standard at GRI - participation in the development of 5 Sector Supplements out of the 10 and involvement in the Topic for Sector research.

(1) Experience and lessons learned from Sector Supplements and Topics for Sectors

The first lesson that can be learned concerns collaboration with stakeholders. Since different stakeholder groups are organised in different ways, it is very important to understand the audience one is reaching and how to should engage with them. For example, Mrs. Bergkamp has noticed that labour organisations, as opposed to other stakeholders, do not express their concerns individually but rather tend to have formal group communications. In order to consider their view, it was therefore necessary to understand their way of working and process their input accordingly. Furthermore, when engaging with external stakeholders it is necessary to have the right timing and to contact the right person directly. Otherwise, an endless chain of email, forwarded from colleague to colleague, can make it difficult to start the dialogue. In addition, not all stakeholders are familiar with the process of sustainability reporting and therefore may have difficulty putting their opinion into words. When communicating with stakeholders, it is important to use simple language and to carefully reflect on the phrasing of questions. Also, the guideline makers must be aware that they will have to read between the lines. Indeed, some stakeholders tend to be concerned about the result of a certain phenomenon only, while it will be necessary for guideline makers to find out the source of the problem.

(2) Recommendations to the port sector

In terms of organising and creating the guidelines, it could be useful o first list the port sectors main activities and the more specific ones. Using this list, the second step is to identify the impacts associated with each activity and reflect on which impacts wholly resulted from the port's activities and which ones are related to some parts only. This differentiation will allow the port to identify which impacts are port-wide problems and which are specific to certain parts. At some point, the list will probably have to be refined, and a prioritisation of activities will be required. Mrs. Bergkamp adds that the inclusion of different types of professionals in working groups has resulted in a richer and stronger topic prioritisation. Another piece of advice concerns the use of Topics for Sectors as an inspiration for the development of the guidelines for ports. As mentioned in the section dedicated to GRI (cf. Chapter 2), certain Business Activity Groups (i.e. 29, 30, 31, 32, 47, 50) might be of interest for the port sector. It could be useful to look over these Business Activity Groups and see whether some groups are relevant when applied to the port context. Using Topics for Sectors as an example not only shows the importance of creating a list of activities, it could also help open the minds of guideline makers to other issues In addition to contributing to the construction of a first list of activities, examining Topics for Sector could be an interesting exercise for the guideline makers to open their minds to other issues.

Annex 9. Record of the second Skype interview with GRI representative: what can be learned from Sector Supplement and what are the recommendations for the port sector?

Date: 14th of July, 2014

Interviewee: Maaïke Fleur, Strategy Adviser at GRI, involved in 8 out of the 10 Sectors Supplements.

(1) Experience and lessons learned from Sector Supplements

During the development of sector supplements, many working groups were frustrated by the fact that they had to stick with GRI guidelines text. Mrs. Fleur highlights however that for the case of the port sector, as long as the working group references the GRI's indicator text, they can borrow from it while also making changes, which would provide more flexibility. In addition, during the development of sector supplements, the working group had to follow the steps of the due process. It will be hard for the port sector to duplicate such a process, since GRI has bodies in place that the port sector does not. One interesting point that the port sector should however try to include is public participation. Although some comments from the public were sometimes off base, Mrs. Fleur believes it is good to have the public on board in order not to limit insight to the working group. Furthermore, she also mentioned that the development of some Sector Supplements was easier than that of others, e.g. the oil and gas and the financial sectors. These sectors are relatively small in terms of both diversity and companies, and it makes things easier when the material impacts are approximately the same.

(2) Recommendation to the port sector.

When it comes to direct advice, Mrs. Fleur first of all recommends not calling the guidelines a Sector Supplement, but rather a "GRI interpretation guide for the port sector". Then, the first step to be undertaken in order to create such a guide is the preparation of a desk-based research paper exploring the availability of resources. This paper could look at the GRI Guidelines while also reflecting on other available research on the port sector. Moreover, reviewing available SR among the port sector and identifying topics included could be of interest. It would allow for a comparison of various ports' SRs and for the identification of indicators used by multiple ports and those unique to certain ports. Still prior to the development of the guide itself, a project description highlighting the main steps, dates and deadlines, participant stakeholders, task repartition, etc. should be drafted. To add transparency to the process, the project description should clearly state how and when the public has the opportunity to provide complaints and comments. After this description is created, it would then be important to stick to these defined ideas and set schedule in order to avoid vulnerability to criticism. Creating a small website with the above-mentioned elements could also be envisaged to further highlight the transparency principle.

In terms of content, the GRI interpretation guide for the port sector should ideally first contain a reflection on the diversity of ports within the port sector in itself. Even if the decision is made to develop guidelines for all ports, i.e. for the port sector as a whole, it is important to acknowledge and identify the degree of variety amongst them. Similarly, a reflection on why it is important to have port specific interpretation of the GRI Guidelines should be included. In Mrs. Fleur's experience, spending some time on these kind of written reflections helps avoid criticism. The GRI interpretation guide for the port sector could contain – amongst other things - the following sections or chapters:

- An introduction explaining why reporting is important for the sector and providing an overview of the main sustainability impacts of sector organisations;
- Descriptions of sector stakeholders and how organisations can engage with them.
- A list of possible material topics for the sector;

- A list of possible material GRI Aspects and material GRI Disclosures for the sector;
- An explanation of how to understand certain GRI Disclosures for sector reporters;
- Examples of what to report for certain GRI Disclosures in the sector context;
- Suggestions on what could be added to GRI Disclosures to ensure that report readers fully understand;
- Relevant references to sector resources (for example, handbooks and tools).

Annex 10. Overview of the four categories of environmental indicators identified in this study in the context of developing a Sector Supplement - or the equivalent - for the port sector: GRI G3.1 environmental indicators that could be set aside (1), kept without (2) or with modifications (3) and non-GRI G3. 1 potential material environmental indicators - obtained from the Analysis.

ASPECTS		GRI G3.1 Environmental indicators			
		CATEGORY 1 <i>Could be set aside</i>	CATEGORY 2 <i>Could be kept without modification</i>	CATEGORY 3 <i>Could be kept with modification</i>	CATEGORY 4
Aspects covered under G3.1	MATERIAL	EN1, EN2	-	-	-
	ENERGY	-	EN3, EN6, EN7	EN4, EN5	Initiatives to (1) provide vessels with low sulphur marine fuel or alternative and (2) incentivise low sulphur emitters (e.g. discounted harbour due rate and associated awards) <i>(To be linked with EN16)</i>
	WATER	-	-	EN8, EN9, EN10	Water quality
	BIODIVERSITY	-	EN11, EN14	EN12, EN13, EN15	Compensation area
	EMISSIONS	EN19	EN16, EN17, EN18	EN20	GHG emission intensity (G4-EN18) Air quality <i>(to be linked with EN20)</i>
	EFFLUENTS	-	-	EN21, EN23, EN25	Initiatives related to spills preparedness and response
	WASTE	-	-	EN22, EN24	Discounted harbour due rate for waste
	PRODUCTS AND SERVICES	EN27	-	EN26	-
	COMPLIANCE	-	EN28	-	-
	TRANSPORT	-	-	EN29	-
	OVERALL	-	EN30	-	Level of implementation of the EMS
	GRIEVANCE				Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms (G4-EN34). To be adapted to the port sector, i.e. to cover noise, odour, air quality.
SOIL AND GROUNDWATER				Soil quality Sediment quality	