

# Erasmus University Rotterdam

## Erasmus School of Economics

Bachelor Thesis (Economics and Business economics)

Drivers and Actions of Ports towards Contributing to the SDGs: an initial portfolio analysis on the World Port Sustainability Program

Rick de Lange

Student number: 434134

Supervisor: M. Jansen

Second assessor: J. van Haaren

Date final version: 20-08-2018

Abstract – In March 2018 the World Port Sustainability Program (WPSP) was introduced. The program aims to collect, coordinate and communicate good practices between ports and port associations. However, the effectiveness of the program and its projects have not been measured or analyzed. This paper aims to provide an initial methodology to analyze the effectiveness of the WPSP. As literature on Sustainable Development (SD) and Corporate Social Responsibility (CSR) and port development are converging, SD and CSR take a central place in this paper. By conducting a literature study, the impact of ports and benefits of engaging in CSR are discussed. This reveals that ports primarily engage with CSR out of “license to operate” considerations. The qualitative analysis of the WPSP analyzes 23 port projects initiated by various ports around the world. The effectiveness is analyzed by linking the projects the targets of SDG 9, 14 and 15. The paper recommends that further research is needed to propose a well-constructed methodology to measure the WPSP its effectiveness.

## Contents

|  |    |
|--|----|
| Summary .....  | 3  |
| 1 Introduction .....   | 4  |
| 1.1 Sustainable development and Corporate Social Responsibility in port areas .....            | 5  |
| 1.2 Sub-questions .....  | 6  |
| 2 Literature study .....   | 8  |
| 2.1 United Nations sustainable development goals .....   | 8  |
| 2.2 Sustainable development .....  | 9  |
| 2.3 Corporate Social Responsibility .....  | 10 |
| 2.4 Sustainable Development and Corporate Social Responsibility in port areas .....            | 10 |
| 2.5 Impact of Ports and their ability to contribute to the Sustainable Development Goals ..... | 12 |
| 2.5.1 Economical aspect .....  | 12 |
| 2.5.2 Social aspect .....  | 13 |
| 2.5.3 Environmental aspect .....   | 14 |
| 2.5.4 Capability of ports: Green port strategy .....   | 15 |
| 2.6 Benefits of contributing to the Sustainable Development Goals .....                        | 15 |
| 2.6.1 Benefits of Corporate Social Responsibility .....  | 16 |
| 2.6.2 Evidence of Corporate Social Responsibility benefits .....                               | 17 |
| 2.6.3 Corporate Social Responsibility benefits in the Port sector .....                        | 17 |
| 2.6.4 Motives and actionability towards SDGs .....   | 19 |
| 2.7 Conclusions .....  | 19 |
| 3 Methodology .....  | 20 |
| 4 Analysis of the World Port Sustainability Program: the port projects .....                   | 21 |
| 4.1 Data .....   | 21 |
| 4.2 Research findings .....  | 24 |
| 4.2.1 The engagement of port projects with the sustainable development targets .....           | 25 |
| 4.2.2 Motives and actionability of port projects .....   | 27 |
| 4.2.3 Performance indicators of the port projects .....  | 28 |
| 5 Conclusion & Discussion .....  | 28 |
| 5.1 Main findings .....  | 29 |
| 5.2 Main conclusion .....  | 30 |
| 5.3 Limitations research .....   | 31 |
| 5.4 Suggestions future research .....  | 32 |

6 References ..... 32

7 Appendix ..... 36

7.1 A..... 36

7.2 B..... 37

7.3 C..... 43

## Summary

This research paper gives an initial analysis of the port projects displayed by the World Port Sustainability Program (WPSP), which is a program which was launched in March 2018. This program commits around a 1,000 ports to contribute to the 17 Sustainable Development Goals (SDGs). The program aims to collect, coordinate and communicate good practices between ports and ports associations. The results of this paper aim to answer the main question: *To what extent have ports been motivated and taken action (so far) towards their commitment to contribute to the realisation of the sustainable development goals?* The question aims to reveal the extent in which ports have taken action and the underlying motives to engage in specific projects which aim to contribute to the SDGs. As ports have committed themselves to the SDGs, the concepts of Corporate Social Responsibility (CSR) and Sustainable Development (SD) are used to bring forward the theoretical framework. This research addressed the research question by first checking if ports are actually able to contribute to the SDGs, which is done by looking at the current economic, social and environmental impact of the port. Secondly, this research has displayed the motives for the ports to contribute to specific relevant SDG targets. Finally, the relation between the port projects and the SDG targets are analyzed by a qualitative analyses to examine the contribution port project make to the SDGs. The paper is based on an extensive literature review, as well as a quantitative analysis of the WPSP port projects. The paper shows the contribution of the adopted port projects towards reaching three SDGs: 9, 14 and 15, where port authorities and companies appear to be primarily driven by license to operate considerations. The motive of the port companies is divided in a “doing no harm” and a “doing good” motive. It appears that port companies are generally motivated to do no harm. Furthermore, various projects aim to realize the SDGs, but are lacking a direct link to the underlying targets. The results of this paper should be viewed with the following limitations in mind. Given limitations of time, the scope was deliberately focussed on three out of the 17 SDGs, which were taken into the analysis. Considering the results, this paper recommends that more research is necessary to measure the effectiveness of the WPSP. Future research could examine the motives of the port projects more carefully and measure precisely, the status and effectiveness of the projects. Further research is required to strengthen the external validity of the conclusions, specifically in relation to the methodology of the content analysis. This methodology is needed to unambiguously link the project sheets to the SDG targets. The initial coding schemes in the appendix may serve as an initial step.

## 1 Introduction

On the 22<sup>nd</sup> of March, the World Port Sustainability Program was launched. This program aims to “*demonstrate global leadership of ports that contribute to the Sustainable Development Goals [(SDGs)] of the United Nations [(UN)]*” (ESPO, 2018, p.1). This initiative shows that the port authorities and the organizations involved want to contribute to sustainable development. The program can be interpreted as a global library for port projects and initiatives that, eventually, may lead to the WPSP being a think-tank and breeding ground for new collaborative port projects (ESPO, 2018). The introduction of the WPSP is in line with the recent trend that the public is increasingly aware of global environmental and social issues and that corporations will have to adjust themselves to be more responsible. There are two key concepts that focus on the responsibility of corporations towards the public, which are Corporate Social Responsibility (CSR) and Sustainable Development (SD).

Governments around the world are adopting policies to implement action plans to mitigate the consequences of climate change and contribute to the sustainable development goals. This renewed interest is due to pressing global problems such as climate change, poverty, human rights violations and HIV/aids (Kolk & Van Tulder, 2010). In the discourse of port development, research on corporate social responsibility and sustainable development are proliferating. To address these problems corporations and other entities will have to develop themselves in a sustainable way. The concept of sustainable development emerged, because of the growing awareness between environmental problems and socio-economic issues, which are linked on a global scale (Hopwood, Mellor, & O'Brien, 2005). Traditionally, the responsibility to improve the living conditions for society has been the role of the government, but due to increasing globalization and international trade this is no longer possible (Jamali & Mirshak, 2007). However, while governments may not be able to improve the living conditions of the society, the needs (problems) of the society still can be fulfilled (solved) by corporations (Jamali & Mirshak, 2007). This is possible by using the financial means, technology and management capabilities of the corporate sector. By pressuring corporations, it is possible to give (multinational) corporations the incentives to be socially responsible and contribute to sustainable development (Moon, 2007). Especially multinational enterprises (MNEs) can play a significant role to help and solve the range of problems mentioned before, because they face a range of issues, stakeholders and institutional contexts in both home and host countries (Kolk & Van Tulder, 2010).

There are, of course, critics on the use of CSR in business practices. The main critic is that CSR leads to less wealth creation, because it distracts the business to maximize their profits. As Friedman (1962) defines social responsibility: *“There is one and only one social responsibility of business, to use its resources and engage in activities to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition, without deception or fraud.”* This definition goes against the concepts of CSR as we know it (Bhagwat, 2011). Also, other scholars around the 1960s opposed this view, like Penrose (1959). Her theory puts more responsibility to firm to use their resources in responsible way. This indicates that the debate about corporate responsibility is going on for decades. Now, we see a more prominent place for corporate responsibility in day-to-day business practices, which explains the renewed interest by scholars and corporations. CSR can also be beneficial to various corporations. Corporations which engage in CSR activities create favorable stakeholder attitudes and better support behavior. In the long run, it can also improve the corporate image and strengthen stakeholder-company relationships (Du, Bhattacharya, & Sen, 2010). The question is whether ports are adopting corporate social responsibility in their development strategies.

### 1.1 Sustainable development and Corporate Social Responsibility in port areas

*“Ports are nodal points in global supply chains and at the same time are connected with local and regional communities, they can enact on regional and local challenges such as climate change, mobility, digitalization, migration and social integration.”* (World Port Sustainability Program, 2017, p.1). The presence of ports in the global logistic chain is substantial, since around 90% of the world trade is carried around by the international shipping industry (International Chamber of Shipping, 2017). The development of port facilities and operations contribute significantly to the increase of maritime transport, economic development of coastal countries and the provision of direct and indirect employment. Unfortunately, these developments also have consequences on the environment and society, impacting the air, water, soil and sediments. Since environmental awareness is increasing, it is important for ports to realize that they need effective environmental management policies to maintain and enhance the relationship with their stakeholders, so that the stakeholders will continue to give their support for port development and operations. (Puig, Wooldridge, & Darba, 2014). An experiment by Sen, Bhattacharya, & Korschun (2006) found evidence that stakeholder relations can be improved by using CSR initiatives, such as donating to good causes and making investments in the community. These initiatives can give companies or

ports a competitive advantage over other companies/ports by receiving more positive consumer attitudes. To maximize the returns of CSR initiatives, companies/ports have to make the stakeholders aware of and even engage them in these initiatives (Sen et al, 2006).

Now we have seen that ports potentially can have a contribution to global sustainable development, it is important to know how they will actually act upon it. Recently, the World Port Sustainability Program (WPSP) has started. This program is guided by the 17 UN Sustainable Development Goals (SDGs) and it wants to “*enhance and coordinate future sustainability efforts of ports worldwide and foster international cooperation with partners in the supply chain*” (World Port Sustainability Program, 2017, p.1). As mentioned, this program is guided by the UN SDGs which were introduced in 2016 to mobilize the efforts of all countries to end poverty, fight inequalities and tackle climate change (United Nations, 2016). By using the WPSP, ports can collectively introduce projects and coordinate them among one another (World Port Sustainability Program, 2017). The program can create a well organized system that contributes to the UN SDGs. In the program, the port projects are divided into five different themes: Climate and Energy; Community outreach and port-city dialogue; Resilient Infrastructure; Government and Ethics; and Safety and Security which will give a clear overview of the projects. Now, it is relevant to see how the port projects, in the portfolio of the WPSP, will contribute to the realisation of the SDGs. This is answered by the following main research question:

*Main question: To what extent have ports been motivated and taken action (so far) towards their commitment to contribute to the realisation of the sustainable development goals?*

The main question focuses itself on the sustainable development themes of the WPSP program and uses the targets of the SDGs to see if the port projects have an influence on contributing to one or multiple themes. The aim of this question is to look into the effectiveness of the WPSP as a contribution to the SDGs. To answer this question, the port projects of the WPSP are analyzed, resulting in a qualitative analysis of the projects to find out to which sustainability targets they have an influence on.

## 1.2 Sub-questions

The main question is answered by using three sub-questions. The first two sub-questions are answered by conducting a literature study and the last sub-question is answered by using qualitative empirical research alongside existing literature.

The first sub-question focuses itself on the capabilities of ports when it comes to sustainable development and if they can have a contribution to the sustainable development themes. It is as follows:

*Sub-question 1: Can ports contribute to sustainable development on a regional, national and international level?*

As will be mentioned in the literature study, ports are pursuing growth since they are becoming more privatized. Unfortunately, the growth of ports goes alongside with negative externalities, like air, water and soil pollution, which affect the local community (del Saz-Salazar & García-Menéndez, 2016). This gives an indication that ports are responsible for negative externalities and that they are able to do something about it, since they cause it. This question takes a wider approach than just the local level and also looks at national and international level of the contribution ports can make.

Assuming that ports can contribute towards accomplishing the SDGs, what benefits are there for ports? The next question focuses on this aspect. As will be discussed, Acciaro (2013) mentioned that ports need the legitimacy of their stakeholders in order to grow and perform their day-to-day operations. By implementing CSR into the business plans of port companies, it can contribute to SD which can create stakeholder value for the port. This leads to the second question, which gives an insight on the positive aspects of contributing to sustainable development.

*Sub-question 2: What benefits can ports get from contributing to the sustainable development goals ?*

The empirical question focuses itself on the engagement of ports towards the SDGs. Van Zanten & van Tulder (2018) made a distinction of the way MNEs are engaged with the SDGs. They looked at the motives and actionability from the perspective of the SDGs. The SDGs have various targets which can be labelled by using the targets' motive and actionability. The motives are divided in "doing no harm" and "doing good," where the motive "doing no harm" relates to the targets which aim to avoid the negative externalities of various operations and the motive "doing good" aims towards the targets that are proactively improving sustainable development, like target 9.5: *"Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and*



*substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.”*

The distinction in this paper is focused from the perspective of the port projects. The distinction is made by looking at the intention of the engagement by the port projects with the SDGs by defining the engagement of the port projects as proactively doing good, or preventing the negative impact of its operations (avoiding harm) and also by looking at the internal or external actionability of the port projects, so if the projects are performed individually or with multiple organizations. By looking at the motives and actionability of the port projects, this paper can identify the aim of the projects and look if ports are doing the project alone or together. By using the paper by Van Zanten & Van Tulder, the third sub-question focuses on the motives and actionability of the port projects:

*Sub-question 3: How are ports engaged with the SDG targets (given their motives: doing good or avoiding harm) and what is the actionability of their projects?*

Now that the sub-questions are discussed, this section is followed by the literature study and the methodology section. After the methodology, sub-question three is answered by first explaining the data, which is followed by a qualitative analysis of the WPSP port projects portfolio. Finally, it leads to a conclusion where the results are discussed, the main question is answered and a recommendation is made for future research.

## 2 Literature study

This section provides a literature study that further engages with the Sustainable Development Goals and the theory of sustainable development and corporate social responsibility. The conducted literature study also answers sub-questions one and two. After the study, the methodology for the qualitative analysis is elaborated and empirical analysis is performed. Together with the literature study this result into the conclusion of this paper.

### 2.1 United Nations sustainable development goals

The United Nations is an international organization, that focuses itself on the issues faced by humanity like peace, climate change, sustainable development and human rights (United Nations, 2018). In 2015, world leaders adopted the 17 Sustainable development Goals of the 2030 agenda for Sustainable Development of the United Nations. The sustainability goals (appendix A) aim to end poverty and hunger, to better the standards of education and healthcare, to achieve gender

equality, to have sustainable growth while promoting jobs and stronger economies and that sustainability includes health of the land, air and sea (Krishna, Manickam, Shah, & Davergave, 2017). All the SDGs have targets that should be reached by 2030. It will be important for ports to identify to which sustainable development targets they can contribute too. The targets set by the UN can be used as a benchmark by looking at the contribution port projects make to reach those targets.

Port companies and authorities enacted on these goals by introducing port projects that contribute to the SDGs and eventually port organizations jointly introduced the WPSP. The program uses the SDGs as guidelines and implements them along five sustainability themes. These themes are Climate and Energy, Community outreach and port-city dialogue, Governance and Ethics, Resilient Infrastructure and Safety and Security. The themes can cover a non-exhaustive list of potential topics and all of the SDGs, which makes it useful for ports to indicate which area of interest and which SDG their project is related too. As mentioned in the introduction, the program wants to enhance and coordinate sustainability projects and increase cooperation in the international supply chain.

## 2.2 Sustainable development

The most known definition of SD came forth in the report *Our Common Future*, or commonly known as the Brundtland report, which defines sustainable development as: “*meeting the needs of the present without compromising the ability of future generations to meet their needs*” (Brundtland, 1987, p. 43). This definition combines environmental and socio-economic questions and recognises that ecology and economy are getting more connected, on a local, regional, national and global scale (Hopwood et al, 2005). Since the Brundtland definition, the concept of SD has known many different definitions and interpretations. This enables the concept to fit in different situations at multiple levels, from local to global scale and at the governance, businesses and society level (Kates, Parris, & Leiserowitz, 2005). Many generally accepted definitions, after the Brundtland definition, have a three-pillar or triple bottom line conception. The triple bottom line has three dimensions; the environmental, economic and social dimension and form the base of SD (Lehtonen, 2004). In the triple bottom line model the dimensions are seen as equal and mutually interacting dimensions, where the importance of each dimension can vary in different situations, but will not get priority over the others.

As each situation can have a different interpretation of SD, there is reason to look what the concept means in the context port and port related activities. This is discussed after the next section.

### 2.3 Corporate Social Responsibility

The concept of CSR gained renewed interest in the corporate world as society is becoming more aware of global issues which are caused by globalization and international trade. While the concept of CSR is widely used, there still no clear definition for the concept. Dahlsrud (2008) made an analysis of 37 definitions of CSR and came to the conclusion that CSR is consistently referring to five dimensions; the environmental, social, economic, stakeholder and voluntariness dimension. The definitions in the article by Dahlsrud (2008) are describing a phenomenon where it's more important for businesses to understand how CSR is socially defined in a specific context than to know a clear and universal definition. The World Business Council for Sustainable Development (2000) defined CSR as: *“Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as the local community and society at large.”* This definition gives the main idea of CSR, which is that business corporations have an obligation towards society to meet the needs of their stakeholders (Jamali & Mirshak, 2007). In general, business corporations are responsible for the impact they have on their environment and stakeholders, by integrating the concept of CSR into the business plans, corporations aim their business practices and operations to work on maximizing the positive impact on society in the five dimensions mentioned by Dahlsrud (2008). Jamali & Mirshak (2007) are in line with Dahlsrud (2008) which says that the definition and implementation of CSR depends on the context in which it is used. This means that it is necessary to find out what CSR means in the context of the port.

### 2.4 Sustainable Development and Corporate Social Responsibility in port areas

Seaports, from now on ports, are complex and dynamic entities where various activities are carried out by different organization and actors (Bichou & Gray, 2005). Due to the variety of the port its operations, it facilitates many companies, organizations and public entities in a direct and indirect way. In this paper the understanding of the port relates to the port authority and companies located in the port which directly interact with the port's core operations, being a nodal point in the logistical chain. The reason to use this conceptualization is because the WPSP port projects are initiated by the port authorities and relevant organizations/companies that interact with the ports directly.

The governance of most ports changed from a public entity towards a more private one over the past few decades. Port authorities therefore have been acquiring characteristics of private enterprises (Brooks, 2004). This gives reason to look for a definition of SD that focuses itself on corporate performance. In the corporate business context, sustainable development is operating a business while causing minimal harm to any living creature (Lam & Van de Voorde, 2012). It is seen as an integration of economic, social and environmental criteria, where a balance is maintained among these dimensions and supports the organization's long term competitiveness. Any sustainable measure taken must contribute to and improve economic performance (Lam & Van de Voorde, 2012). In short, Hiranandani (2014) defined port sustainable development as followed: *The situation in which the port is able to meet its needs without endangering its own future*" (Hiranandani, 2014, p.130), which is in line with the Brundtland definition. This means that the strategy of the ports have to meet the current and future needs of the port and its stakeholders while protecting the society and natural resources (Hiranandani, 2014). The key component to achieve sustainable development, according to Lam & Van de Voorde (2012), is by using stakeholder analyses and consultation, which can identify the driving forces that can lead to SD.

The privatization of ports also means that ports are pursuing growth, efficiency and financial independence and are facing increased competition. In order to grow the port needs to attract new customers and maintain the current ones by making larger efforts in terms of social responsibility. To do this, ports need the legitimacy from the public, local/regional communities and from their customers and users (Acciaro, 2013). To attain the legitimacy, ports have to deal with higher pressure from different stakeholders. The pressure arises from the public, higher regulatory and social requirements and also from investors and trading partners. The aspect that the stakeholder are focusing on is the environmental aspect. Port areas need to increase a higher level of environmental performance and comply with the regulatory and social requirements to ensure the support of the public, which can have an impact on the future space that port areas can use to grow. Environmental performance is also increasingly important to attract investors and trading partners, because a port area with strong environmental performance and a high level of public support is to be favoured compared to ports with lower environmental performance and public support. So, for the port authority it is a challenge to minimize pollutions now and in the future, not only for the port area, but also for a wider logistic area (Lam & Notteboom, 2014). While most literature, like Accario (2013) and Lam & Notteboom (2014) is focused on the environmental aspect of social

responsibility, the concept of CSR takes a wider approach. In this article, port CSR consists of the social, economic, environmental, stakeholder and voluntariness dimension, where ports take social and environmental responsibility while they are working towards economic growth by consulting with their stakeholders, on a voluntary basis. This conception has a different meaning in every port, since they all have different a context, but the essence of the definition will be similar in most ports.

## 2.5 Impact of Ports and their ability to contribute to the Sustainable Development Goals

The first sub-question asks the question: *Can ports contribute to sustainable development on a regional, national and international level?* To answer this question we first look into the influence that ports can have on a regional, national and international level on the social, economical and environmental aspect.

### 2.5.1 Economical aspect

Ports are nodal points in the global supply chain and acts as a gateway for various products moving towards its hinterland. As mentioned in the introduction, 90% of the world's trade is carried out on the ocean. This suggests that ports can have a major influence on the international, but also the national and regional economy. There are two impacts that ports have on the regional and national economy, the direct impact and the indirect impact. The direct impact results from activities that are directly related to the port, like employment generated by the port, and the indirect impact results from activities that support the port, like employment of port related industries (Shan, Yu, & Lee, 2014). Shan, Yu and Lee (2014) made an empirical analysis of Chinese seaports and their impact on their host cities. They found evidence of the importance of ports in a port city's economic growth. This gives an indication that ports have a major impact on the economic development of its city and, therefore, also on its region. Notteboom & Rodrigue (2005) introduced a new phase of port development where port focus more on regional development for their competitiveness, such as hinterland distribution. This also suggests that ports have an affect on the regional development where they are located. As ports have an impact on the regional economy, it automatically impacts the national economy, depending on the size of the port and the country's economy. For example, the port of Rotterdam currently contributes about three percent of the Dutch GDP (Port of Rotterdam, 2017). Besides the port its regional and national impact on th economy, there is also an international/global impact. As ports are facilitators of trade, they impact the global economy. Since the containerization in the 1960s, the world economy has been expanding significantly

(Fremont, 2007). This indicates that ports have an economic influence on the regional, national and international level.

### 2.5.2 Social aspect

As mentioned in the literature study, the idea of CSR is that corporations, in this case ports, have an obligation to society to meet the needs of their stakeholders. The World Business Council for Sustainable Development (2000) took in their definition of CSR that corporations also must improve the the quality of life of the workforce and their families as well as the of the local community and society at large. For the port, this indicates that they have to limit their negative externalities, like air pollution, that influences the quality of life for the local community and improve social responsibility efforts, like supporting humanitarian operations and funding the education of their employees (Acciaro, 2015).

As ports are moving from a public towards a more privatized entity, they need the legitimacy of the local community, the public, and also from their users and customers in order to grow and enhance their port activities (Acciaro, 2015). Since ports are looking for acceptance of the local community and the public as well as their user and customers, the social aspect is focused on the port's stakeholders and especially on external stakeholders, like the local community.

In addition that the public is increasingly aware of the environmental issues in the world, they also are aware of regional environmental problems, like the pollution per city in a country. The concerns of the public are mostly related to the environmental aspect, since environmental conservation is a public issue. Lam & Van de Voorde (2012) studied three ports, Los Angeles/Long Beach, Antwerp and Hong Kong, which all have made efforts to reach the public, where they show that they are dedicated to the reduction of pollution and in contributing to environmental research. Besides these efforts, these ports also engage in community development by providing educational trips, the holding of open houses and more. The case studie of Lam & Van de Voorde (2012) also show that the three ports have different strategies, like most ports will have. Antwerp focuses on the ecological port development, Hong Kong focuses itself on the reduction of the effect of pollutions on the residents and Long Beach/Los Angeles puts special attention on the education of the young.

So, it shows that the focus of ports mostly focuses itself on the reduction of the negative environmental externalities, but also on the awareness and education of the society. As the impact of the port on society takes place on a more local/regional level, ports are unlikely to influence

society on a global level. This can only be done by a collaboration of multiple ports throughout the world. While there is a relationship between the port and social issues, the main focus of scientific research is related towards the environmental impact of the port. This will be discussed in the next section.

### 2.5.3 Environmental aspect

Ports have various activities that contribute to the pollution of the environment. Trozzi & Vaccaro (2000) reviewed the negative externalities of the port. In their article, they identified pollutions from three different sources: pollution by ships, port activities and industrial activities in the port. The impact that the pollutions can have on the environment are numerous. Gupta, Gupta & Patil (2005) categorized these impacts as follows:

1. Coastal habitats may be destroyed and navigational channels silted due to causeway construction and land reclamation.
2. Unregulated maricultural activities in the port and harbor areas may threaten navigation safety.
3. Deterioration of surface water quality may occur during both the construction and operation phases.
4. Harbor operations may produce sewage, bilge wastes, solid waste and leakage of harmful materials both from shore and ships.
5. Human and fish health may be affected by contamination of coastal water due to urban effluent discharge.
6. Oil pollution is one of the major environmental hazards resulting from port/harbor and shipping operations. This includes bilge oil released from commercial ships handling non-oil cargo as well as the more common threat from oil tankers.
7. Air pollutant emissions due to ship emissions, loading and unloading activities, construction emission and emissions due to vehicular movement.

These categories display the major impacts that the pollution by port activities may have. The major environmental concerns of these pollution categories are the air pollution, water pollution and the effect on the maritime ecosystems (Lam & Van de Voorde, 2012). These environmental concerns primarily affect the environment on a regional and national level and indirectly contribute to global environmental issues, such as climate change.

Now that the impact of ports is identified on the regional, national and global level by looking at the three different aspects, there is evident reason to believe that ports can contribute to reducing their negative impact on the environment and on society, while they maintain their economic development, which is needed for the regional, national and global economy. By implementing sustainable and active management, ports can potentially contribute to the SDGs.

#### 2.5.4 Capability of ports: Green port strategy

The question that remains is if ports are also capable to actively implement sustainable development strategies and contribute to the SDGs. One major strategy in academic papers is the Green Port Strategy. Lam & Van de Voorde (2012) developed an original framework to implement the green port strategy into the port its business plan. It was built on four key constructs: stakeholder involvement, green market development, cost effective green policy and sustainable port operations. The figure below displays this framework:



**Figure 1: Green and sustainable port framework**

*Figure 1 Framework for a green and sustainable port. Source: Lam & Van de Voorde (2012).*

In addition, Lam & Van de Voorde used three case studies that illustrated their green policy as a comparative tool, it also indicates that ports are actively and capable to develop themselves on a more sustainable way. The study ultimately provided guidelines for ports to implement a greener strategy and in that way contribute to their sustainable development. This indicates that ports can become more capable to contribute to sustainable development and eventually also to the SDGs.

## 2.6 Benefits of contributing to the Sustainable Development Goals

As discussed, the second sub-question discusses the benefits for ports if they contribute to the sustainable development goals. This is done by using the following sub-question:

*What benefits can ports get from contributing to the sustainable development goals ?*



When ports are contributing to the SDGs, they are basically contributing to sustainable development. One way to incorporate SD, as mentioned, is by implementing CSR. Using the concept of CSR can have benefits for the corporations or ports that are using it. So, first the general benefits of CSR are discussed, then these benefits are put in a port context to examine what these benefits can mean for the port.

### 2.6.1 Benefits of Corporate Social Responsibility

Weber (2008) identified five general business benefits from CSR, which are 1. Positive effect on company image and reputation, 2. Positive effects on employee motivation, retention and recruitment, 3. Cost savings, 4. Revenue increases from higher sales and market share and 5. CSR-related risk reduction management. These benefits are classified into monetary and non-monetary benefits. Monetary benefits are the benefits that can be measured in monetary terms, so benefits that directly influence the cashflow, and also benefits that do not directly impact the cashflow, but can be put in monetary terms. Non-monetary benefits, on the other hand, are benefits that cannot be measured in monetary terms, but do contribute to the firm's competitiveness and financial success (Weber, 2008).

*Table 1 The benefits of CSR for businesses. Source: Weber (2008)*

| Nature of business benefits | Nature of indicators   |  |
|-----------------------------|--|--|
|                             | Qualitative  | Quantitative   |
| Monetary                    |  | <ul style="list-style-type: none"> <li>- Revenue increases</li> <li>- Cost decreases</li> <li>- Risk reduction/management</li> <li>- Increases in brand values</li> </ul>                  |
| Non-monetary                | <ul style="list-style-type: none"> <li>- Improved access to capital</li> <li>- Secured license to operate</li> </ul> | <ul style="list-style-type: none"> <li>- Improved customer attraction, retention</li> <li>- Improved reputation</li> <li>- Improved employee recruitment, motivation, retention</li> </ul> |

---

Table 1 displays the monetary and non-monetary benefits of CSR in terms of qualitative or quantitative indicators. The qualitative benefits generally relate to improved stakeholder relations and quantitative benefits are the benefits which are measurable. This overview of the main CSR benefits is similar to earlier theoretical and empirical research listed in Weber (2008).

### 2.6.2 Evidence of Corporate Social Responsibility benefits

Galbreath (2010) examined the effect of CSR on employee turnover, customer satisfaction and reputation in Australia. The article found evidence that the examined benefits were all positively related with CSR, so it enforces the current research on the CSR benefits and confirms that corporations can benefit from integrating CSR into their business case.

Peters & Mullen (2009) also found evidence that performing CSR can positively impact the financial performance of a firm in the long run. They argue that the contribution of CSR in maintaining and strengthening the stakeholder relations will not only lead to a short term advantage, but significantly contributes to a positive long term effect. The article of Peters & Mullen (2008) examined three benefits of CSR that typically leads to competitive advantages. The benefits are attaining a quality workforce, enhancement of firm reputation and lowering financial risk. These benefits are also represented in table 1, which indicates that the benefits listed there are relevant benefits.

Another study by Oeyono, Samy & Bampton (2011) examined the effect of CSR on the profitability of the top 50 Indonesian listed corporations. This study is mainly focused on the effect of CSR on the financial performance of the firm, which is a result of various CSR benefits a firm has by performing CSR. Their study shows a positive relationship between CSR and the profitability, this suggests that corporations should engage more in CSR, because of the benefits for the business. While it is not clear what the main benefits of CSR are in this study, it does show that CSR contributes to higher profitability.

Now that the benefits of CSR and the empirical evidence are discussed, it is time to see what the important benefits of CSR are in the port sector.

### 2.6.3 Corporate Social Responsibility benefits in the Port sector

To see what the benefits of CSR are for ports, empirical studies are discussed in this section. Grewal & Darlow (2007) did a qualitative study by interviewing managers of 13 Australian seaports. From

their study they obtained what the key benefits are that managers realized, or expect to realize. The key benefits that resulted from the interviews were the development of trust and responsible reputation, important cost savings and the importance of CSR for sustainable success. The benefit, developing trust and a responsible reputation, mostly relates to strengthening and gaining the trust from the port's stakeholders, which is vital for the long term sustainability of the port. This will lead to a better understanding of the port's stakeholders needs, wants and issues by the port's management. So, building trust and a responsible reputation will lead to a better co-existence of the port and society (Grewal & Darlow, 2007).

Important cost savings also results from stakeholder relations. CSR can contribute to trusting stakeholder relationships, which will give the port more autonomy to maintain their business, without being interrupted by stakeholders that question operations and planning. CSR can also save costs by identifying stakeholder trends. This can avoid future conflicts and will lead to higher efficiencies. Acciaro (2013) also argues that stakeholders can delay port projects, which results into substantial costs for the port. This enforces the benefit of CSR that it can reduce costs for future operations. Finally, CSR can help stakeholders to understand the risks involved with the port and can reduce the risk, the costs, if something goes wrong with the port operations. Risk reduction is caused by the reputation and history of social responsibility, which will lead to reduced losses when there is a negative impact of something (Grewal & Darlow, 2007).

The third benefit, sustainable success, is caused by the triple bottom line concept of sustainable development. For the port it is important to understand that the three dimensions (economic, social and environmental) are interdependent and equally important. This means that economic success also depends on the performance in the social and environmental dimensions and that the measures taken, to be social and environmental responsible, must not overshadow the economical impact of the port (Grewal & Darlow, 2007).

These benefits of CSR all result in that a port can create a competitive advantage over other ports. By engaging in CSR activities, ports can become more sustainable which is preferred in the supply chain (Acciaro, 2015). As ports are acting like corporations they can benefit from all the CSR benefits in table 1, but for the port there are some benefits that are particularly important. The focus is to create a competitive advantage over other ports by applying CSR. First, general evidence was found that corporations, which engage in CSR, gained real benefits. In the port sector, the research

by Grewal & Darlow (2007) gave insight in what port managers are realizing or hoping to realize by using CSR. To answer sub-question two, the key benefits of CSR in the port sector, according to Grewal & Darlow (2007), is to increase the trust and responsible reputation, to reduce costs and sustainable succes in order to gain a competitive advantage. These benefits can differ in different port context, but gives a general overview of the important benefits CSR can have for ports.

#### 2.6.4 Motives and actionability towards SDGs

The method used for the qualitative analysis is based on the method used by Van Zanten & Van Tulder (2018), who analyzed the SDG targets in the private sector. The method they used was to obtain relevant targets for the private sector by condensing and summarizing these targets. Finally, for each target they listed the relevant SDGs, actionability (internal or external) and the motive (avoiding harm or doing good). While Van Zanten & Van Tulder took the perspective of the SDG targets, this paper takes the perspective form the port projects.

|         |               | Actionability |          |
|---------|---------------|---------------|----------|
|         |               | Internal      | External |
| Motives | Doing good    | Port Projects |          |
|         | Doing no harm |               |          |

Figure 2 Model of the division of the port projects based on motive and actionability.

## 2.7 Conclusions

Literature on SD and CSR and the discourse on port development literature is converging. It shows from literature that corporations have different motives to introduce and apply corporate social responsibility, which either comes from inside or outside the corporation. Furthermore, they have different ways to operationalize these concepts. Van Zanten & Van Tulder recently introduced a model that links multinational enterprises with the SDGs. The model takes the SDG

targets and looks at the actionability, the motive and the relevant SDGs of the target. This model is taken as the conceptual framework for this paper. In this paper, however, the port projects are taken as the starting point of the model instead of the SDG targets. This leads to a meaningful analysis of the WPSP. In the next section, the method of the analysis is further elaborated.

### 3 Methodology

This section is used to provide the used methodology for the third sub-question. To answer the third sub-question a qualitative analysis of the WPSP projects is used. To find out what the motives and actionability of the port projects are, they are analyzed. The internal or external actionability of the port projects looks if the project is performed by multiple (external) organizations or only one (internal). The analysis is done by individually checking every port project of the WPSP. The following data is collected of each port project: the port project title, the port, the country, the authority, continent, area(s) of interest, the issue, the solution, year of publication, performance indicators available (Yes/No), if it contributes to a SDG target, the motive (doing no harm or doing good) and the actionability. Each port project can be relevant for multiple areas of interest. To include this in the data set, for every area of interest of a port project a new column was made. Also, not every target is relevant for every area of interest, so a target is marked if it the port project contributes to it and if the area of interest is relevant for the target.

In total there are 30 targets belonging to the three SDGs examined. A target is marked for a specific project in using the following method. From the targets, various code words are retrieved which make an important appearance in the targets' descriptions. These code words are available in table 10 (Appendix B). By reading every project used for the analysis, a connection is made between the code words and text of each project. Since the code words did not often proposed a clear similarity between targets and the projects, also synonyms and the intention of the project is considered when linking the targets to the various projects. An example can be found in Appendix 8.3 C. So, the targets are linked towards the projects mainly by personal observation and interpretation. Unfortunately, this leads to limitations of the research discussed in chapter 6.4. Nevertheless, this research paper still proposes interesting findings which have meaning for future research.

From the data set, the following results are extracted: the targets marked per project, the targets marked per area of interest, the motives and actionability of the projects and the total number of projects where performance indicators were available.

The analysis of the data results into a conclusion that answers the third sub-question. In the next section the literary study is conducted that answers the first and second sub-question. Then, the data and the accumulation of the data is described and the research results are displayed which leads to a conclusion on the third sub-question. Finally, all the answers on the sub-questions leads to a conclusion, which gives an answer to the main question.

## 4 Analysis of the World Port Sustainability Program: the port projects

Sub-question three focuses itself specifically on the port project listed in the WPSP. The question: *How are ports engaged with the SDG targets (given their motives: doing good or avoiding harm) and what is the actionability of their projects?* is answered by conducting a qualitative analyses of the collected data which leads to research findings. From the findings, a conclusion is made and the sub-question is answered. First the data is discussed.

### 4.1 Data

The data that is used was retrieved on July 2<sup>nd</sup>, 2018, by reviewing port projects from a secondary data source. The source of the secondary data is the World Port Sustainability Program. Ports worldwide and WPSP partner organizations can submit their project, which contributes to the UN Sustainable Development goals, on the platform. Before the project is presented in the portfolio of the WPSP, the WPSP team will evaluate the project. There are three types of port projects available on the portfolio page; port projects, partner projects and additional projects. Since the aim of this article is specifically find out what the contribution of the WPSP is on the SDGs and not of other organizations, the partner projects and the additional projects are left out of the data that is used. So, the data that is used comes from the port projects of the WPSP.

The WPSP uses five different areas of interest to allocate the port projects, which are Climate and Energy, Government and Ethics, Port Community and Port-City dialogue, Resilient Infrastructure and Safety and Security. The port projects are put into single or multiple area(s) of interest by the WPSP, depending on the effect the project has. For each project the port, the country, the year of publication, area(s) of interest, relevant SDGs, contacts and a description is available. Most projects also have one or multiple links to websites that are extra explanatory or has performance indicators of the project.

The second secondary data source is the website of the UN sustainable development goals. This website consists of a list of the SDGs. Every SDG has a description of the goal, facts and figures,

targets that need to be achieved before 2030 and relevant links. This article focuses on the targets of the SDGs, which can be seen in appendix B, table 8.

Due to time restrictions not all the targets of the SDGs are used. Van Zanten & van Tulder (2018) indentified gaps in the sustainable development of MNEs. These gaps consists of targets where the MNEs do not or barely engage with. These targets mostly relate to SDG 9, 14 and 15 (see table 7 & 8, appendix B ). These SDGs also are represented in every area of interest of the WPSP except for the area Governance and Ethics. For these reasons and to indicate if ports can fill in the gaps left out by MNEs, which are also relevant for the area of interest, the targets of SDG 9, 14 and 15 are analyzed, which consists of 30 targets. Table 2 below consists of a list of the port projects of the WPSP for each area of interest that is analyzed. The targets of SDG 9, 14 and 15 are displayed in appendix B, table 8.

*Table 2 List of all the WPSP port projects per area of interest. Note: each project can exist in multiple areas of interest.*

| List of all Port projects per Area of interest |  |
|--|--|
| Area of interest                               | Port Projects  |
| Climate and Energy                             | Port of Barcelona - Port Links<br>Port of Antwerp - CLINSH project<br>Port of Auckland - DC micro grid project<br>Port of Guangzhou - Onshore power supply project<br>Port of Le Havre – SAFE SECA project<br>Port of Barcelona – Air Quality Improvement Plan<br>Port of Vancouver – International Collaboration on Vessel Emissions Reduction<br>Ports of Stockholm – Carbon footprint, energy optimization and sustainability reporting<br>Ports of Auckland – Zero Emissions 2040<br>MIT Panama S.A. – Carbon footprint reduction<br>Port of Kobe - Environmental Measures in Reclamation Projects<br>Port of Kristiansand – Shore power supply for cruise ships<br>Port of Amsterdam – Integrated Green Energy Solutions (IGES) |

Community and  
Port-City dialogue

Port of Barcelona – Port Links

Port of Gothenburg – Wetland at Torsviken

Port of Vancouver – International Collaboration on Vessel Emissions  
Reduction

Port of Barcelona – Air Quality Improvement Plan

Port of Le Havre – SAFE SECA project

Port of Barcelona – Study on Cruise Activity

Ports of Los Angeles and Long Beach – Clean Air Action Plan 2017

Port of Antwerp – CIVITAS PORTIS project

Port of Guangzhou – Onshore Power Supply Project

Port of Auckland – DC Micro grid Research Project

Port of Antwerp – CLINSH project

Ports of Stockholm – Carbon footprint, energy optimization and  
sustainability reporting

Port of Açu – Vila da Terra project

Port of Khalifa – Coral Reef protection

Ports of Auckland – Zero Emissions 2040

Fremantle Ports – Fairy Tern Conservation Sanctuary

Port of Kristiansand – Shore power supply for cruise ships

Governance and  
Ethics

Port of Vancouver – International Collaboration on Vessel Emissions  
Reduction

JNPT-Antwerp Port Training and Consultancy Foundation

MIT Panama S.A. – Gender Equity Initiatives

Fremantle Ports – Fairy Tern Conservation Sanctuary

Resilient  
Infrastructure

Port of Barcelona – Port Links

Port of Gothenburg – Wetland at Torsviken



Port of Vancouver – International Collaboration on Vessel Emissions Reduction

Port of Antwerp – CIVITAS PORTIS project

Port of Auckland – DC Micro grid Research Project

Ports of Auckland – Zero Emissions 2040

Fremantle Ports – Fairy Tern Conservation Sanctuary

Port of Kobe - Environmental Measures in Reclamation Projects

Safety and Security

Port of Antwerp – CIVITAS PORTIS project

Port of Amsterdam – MISA software application

Port of Antwerp – PIN Project

---

|                          |    |
|--------------------------|----|
| Total amount of projects | 24 |
|--------------------------|----|

---

In the analysis of the port project, one project is left out of the analysis. This project is the “Study on Cruise Activity” by the port of Barcelona. This is done, because the project is actually a research study, which is not a project that contributes to any of the SDGs. It can provide insights for management or policy, but it is not a project that actively contributes to any of the SDG targets. The study only provided economical facts about the cruise activity in the port of Barcelona. This makes it irrelevant for the analysis, since the analysis focuses on the contribution that the port projects, and not studies, can make towards the SDGs. So, the number of projects that are analyzed is 23.

#### 4.2 Research findings

This section presents an overview of the analysis which is relevant for answering the third sub-question. First, this section shows how and to what extent the port projects and the areas of interest are engaged with the SDG targets. Next, the results display the general motives and the actionability of the port projects and finally, the results show if there are performance indicators available for the port projects.

#### 4.2.1 The engagement of port projects with the sustainable development targets

To measure the engagement of the port project for each SDG the number of port projects that contribute to a specific target are counted as absolute numbers and as percentage of the total amount of projects in table 3.

*Table 3 The Total number of projects that contribute to the specific SDG target. Presented in absolute numbers and percentages of the total amount of projects.*

| Target ID | Total number of projects marked per target |            |
|-----------|--|------------|
|           | Absolute number                            | Percentage |
| 9.1       | 10   | 43%        |
| 9.2       | 12   | 52%        |
| 9.3       | 2  | 9%         |
| 9.4       | 15   | 65%        |
| 9.5       | 13   | 57%        |
| 9.6       | 1  | 4%         |
| 9.7       | 10   | 43%        |
| 9.8       | 6  | 26%        |
| 14.1      | 12   | 52%        |
| 14.2      | 5  | 22%        |
| 14.3      | 1  | 4%         |
| 14.4      | 0  | 0%         |
| 14.5      | 2  | 9%         |
| 14.6      | 0  | 0%         |
| 14.7      | 0  | 0%         |
| 14.8      | 4  | 17%        |
| 14.9      | 0  | 0%         |
| 14.10     | 0  | 0%         |
| 15.1      | 2  | 9%         |
| 15.2      | 0  | 0%         |
| 15.3      | 0  | 0%         |
| 15.4      | 0  | 0%         |
| 15.5      | 3  | 13%        |
| 15.6      | 0  | 0%         |
| 15.7      | 0  | 0%         |
| 15.8      | 0  | 0%         |
| 15.9      | 4  | 17%        |
| 15.10     | 1  | 4%         |
| 15.11     | 0  | 0%         |
| 15.12     | 0  | 0%         |
| Total     |  |            |

This table reveals that the targets of SDG 9 are the targets where the port projects are contributing the most too, compared to the targets of SDGs 14 and 15. It also appears that the port projects contribute more to the targets of SDG 14 than the targets of SDG 15. So, there is reason to believe that the port projects are not significantly engaged with the SDGs, since only the targets of SDG 9 are related to a substantial amount of port projects.

Next, it can be important to see how the port projects are engaged among the different areas of interest. The analyses was done by linking the port projects to the SDG targets and then decide whether the target belongs to one or more areas of interest that the port project was subscribed too.

*Table 4 The number of area(s) of interest marked, for each project that is related to the target.*

| Number of area(s) of interest marked for each project that is related to the target. |       |                    |   |                       |                          |                     |
|--|-------|--------------------|---|-----------------------|--------------------------|---------------------|
| Target ID  | Total | Climate and energy | Community outreach and port-city dialogue | Governance and ethics | Resilient infrastructure | Safety and security |
| 9.1  | 14    | 7                  | 4   | 0                     | 3                        | 0                   |
| 9.2  | 17    | 10                 | 4   | 0                     | 3                        | 0                   |
| 9.3  | 2     | 1                  | 1   | 0                     | 0                        | 0                   |
| 9.4  | 22    | 14                 | 3   | 0                     | 5                        | 0                   |
| 9.5  | 19    | 11                 | 4   | 0                     | 4                        | 0                   |
| 9.6  | 1     | 1                  | 0   | 0                     | 0                        | 0                   |
| 9.7  | 16    | 7                  | 6   | 1                     | 2                        | 0                   |
| 9.8  | 7     | 1                  | 3   | 0                     | 1                        | 2                   |
| 14.1   | 15    | 11                 | 3   | 0                     | 1                        | 0                   |
| 14.2   | 5     | 2                  | 2   | 0                     | 1                        | 0                   |
| 14.3   | 1     | 0                  | 1   | 0                     | 0                        | 0                   |
| 14.4   | 0     | 0                  | 0   | 0                     | 0                        | 0                   |
| 14.5   | 2     | 0                  | 1   | 0                     | 1                        | 0                   |
| 14.6   | 0     | 0                  | 0   | 0                     | 0                        | 0                   |
| 14.7   | 0     | 0                  | 0   | 0                     | 0                        | 0                   |
| 14.8   | 5     | 0                  | 4   | 0                     | 1                        | 0                   |
| 14.9   | 0     | 0                  | 0   | 0                     | 0                        | 0                   |
| 14.10  | 0     | 0                  | 0   | 0                     | 0                        | 0                   |
| 15.1   | 2     | 0                  | 1   | 0                     | 1                        | 0                   |
| 15.2   | 0     | 0                  | 0   | 0                     | 0                        | 0                   |
| 15.3   | 0     | 0                  | 0   | 0                     | 0                        | 0                   |
| 15.4   | 0     | 0                  | 0   | 0                     | 0                        | 0                   |
| 15.5   | 3     | 1                  | 1   | 0                     | 1                        | 0                   |
| 15.6   | 0     | 0                  | 0   | 0                     | 0                        | 0                   |
| 15.7   | 0     | 0                  | 0   | 0                     | 0                        | 0                   |

|                     |   |       |       |      |       |      |
|---------------------|---|-------|-------|------|-------|------|
| 15.8                | 0 | 0     | 0     | 0    | 0     | 0    |
| 15.9                | 4 | 1     | 3     | 0    | 0     | 0    |
| 15.10               | 1 | 0     | 1     | 0    | 0     | 0    |
| 15.11               | 0 | 0     | 0     | 0    | 0     | 0    |
| 15.12               | 0 | 0     | 0     | 0    | 0     | 0    |
| Total               |   | 67    | 42    | 1    | 24    | 2    |
| Total in percentage |   | 49.3% | 30.9% | 0.7% | 17.6% | 1.5% |

From table 4 above it appears that, if a project contributes to a target, the Climate and Energy area of interest is the one where projects contribute the most too. After Climate and Energy, Port community and Port-City dialogue seems to be second most common area of interest where the port projects relate too and the third one is Resilient Infrastructure.

It also appears that the targets where the port projects contribute too are little related towards Governance and Ethics and Safety and Security. So, for these targets it appears that the port projects contribute most to Climate and Energy and Port community and Port-City dialogue.

#### 4.2.2 Motives and actionability of port projects

The overall motives (doing no harm or doing good) and the actionability (internal or external) of the port projects are displayed in this section. For every port project, the motive and actionability is checked by individually looking at the description of the project and it is determined to whether it belongs to doing no harm or doing good and if the project is internally or externally actionable.

*Table 5 The motives and actionability of the port projects, derived from their description in the WPSP.*

| Total amount of projects per motive and actionability |                  |   |
|---|------------------|---|
|   | Absolute numbers | Percentage of the total amount of projects, 23 projects |
| Motive - Do no harm                                   | 16               | 69.6%   |
| Motive - Doing Good                                   | 7                | 30.4%   |
| Internal operability - doing it alone                 | 9                | 39.1%   |
| External operability - doing it together              | 14               | 60.9%   |

The indication that table 5 gives is that the majority of the port projects have a doing no harm motive, 69.6 % to be exact, and also have an external actionability, namely 60.9 %. This indicates

that most port projects are aiming to reduce the negative externalities caused by the port, by working together with other entities, like organizations, corporations or the government.

#### 4.2.3 Performance indicators of the port projects

The WSPSP also provided, for some ports, performance indicators within the project's description or via external links at the bottom of the web-page. These performance indicators are useful to give an indication of the effectiveness of the WSPSP program and the project. In table 6, the results are shown of the ports projects which have performance indicators or not.

*Table 6 This table shows the amount of port projects which have performance indicators or not.*

| Port Projects (23 total)      | Perf. indicators available (y/n) |
|-------------------------------|----------------------------------|
| Total Yes                     | 8                                |
| Total No                      | 15                               |
| Percentage Yes of 23 projects | 34.8%                            |
| Percentage No of 23 projects  | 65.2%                            |

The table shows that 15 of the 23 targets has no performance indicators available, which is more than 65% of all projects. So, for the engagement of the port projects that can lead towards contributing to the SDG targets, there is, for most projects, no clear measurement or performance indicators available. Now that results of literature study and qualitative analysis are available, it is time to conclude this article in the next section.

## 5 Conclusion & Discussion

This article aims to find out to what extent ports have been motivated and taken action towards contributing to the realisation of the SDGs. The main question is as follows:

*Main question: To what extent have ports been motivated and taken action (so far) towards their commitment to contribute to the realisation of the sustainable development goals?*

In order to answer this question, three sub-questions were made that, combined, leads to an answer on the main question. Before the main question is discussed, the sub-question one and two are summarized as the main findings of sub-question three are too. This is followed by the limitations of this article and after, a recommendation is made for future research and for the WSPSP.

## 5.1 Main findings

The first sub-question examined if ports can actually contribute to the SDGs on a regional, national and international level. By conducting a literature review, it has become clear that ports can have a significant impact on the regional, national and international economy. The social aspect is quite different. Ports do have an impact on the local/regional and even national society, but as the distance to the port increases, the impact decreases. This implicates that ports can primarily only contribute to the SDGs on a regional and national level for the social aspect. The environmental aspect of ports can be substantial with the different ways the ports pollute the environment, as listed in the literature study. The major environmental impact of the port, as with the social aspect, happens on a local/regional and national level, but as ports also pollute air and water, the environmental impact of ports is felt on a global level.

The result of the literature study is that ports do have an impact on the three aspects, and that they almost all, have an impact on the regional, national and international level. So, ports are able to have an active contribution towards the realization of the SDGs.

The second sub-question explores what the benefits for ports can be by contributing to the SDGs. This was done by looking at the benefits of performing or implementing CSR. The main finding was that the key benefits for ports are to enhance the trust and responsible reputation, to reduce costs and to achieve sustainable succes.

The third sub-question brings the main contribution to answering the main question. It answers the question how ports are engaged with the SDG targets (given their motives: doing good or avoiding harm) and what the actionability is of the port projects. This can be seperated into two parts, the engagement of ports to the SDGs and what the motives and actionability of the port projects are.

The main findings of the first part is that, of the SDG targets that are considered, the port projects mainly contribute to the targets of SDG 9, and barely to SDG 14 and 15. This indicates that ports are not really contributing to SDGs that seem, on first hand, important for them. The findings of the second part indicates that most port projects have the motive of “do no harm” and an external actionability. The motive of doing no harm could be seen as logical, as port are primarily pressured by the public to reduce the environmental impact of their operations. The external actionability indicates that ports are engaged with various entities and that cooperation is needed in order to initiate port projects. A reason of the port projects being prominently external actionable could be

that contributing to the SDGs is too difficult, or has too many facets to perform it alone. This could be interesting for future research to find out.

Furthermore, the performance indicators of the port projects were presented. This shows that there are very little performance indicators available, about 35 % of 23 project. In order to find out to what extent ports contribute to the SDGs, it is important to have measurement that gives an indication of the contribution the projects make.

## 5.2 Main conclusion

The conclusion of the main question is separated into two parts. First the part focuses on the extent that ports have been motivated to towards their commitment to contribute to the realisation of the sustainable development goals. The second part focuses on the extent that ports have taken action towards the realisation of the sustainability goals.

Sub-question one made clear that ports are able to contribute towards sustainable development, since ports have an impact on all the three dimensions of sustainable development. For ports to be interested in contributing to the SDGs, it is important that there are also benefits for the ports and not only costs. The benefits of the contributing to the SDGs, by implementing CSR, can have a positive effect of the financial performance of the port, especially in the long run. From the research findings it is clear that port mostly contribute to the SDGs by a “doing no harm” motive and that the area of interest where ports contribute the most to is Climate and Energy. This can be seen as logical, because ports are increasingly feeling the pressure from society to be more environmentally responsible, so reducing the negative impact of the port’s operations is a reasonable first step to make. For the extent that ports are motivated to contribute to the SDGs, it appears that ports are largely motivated to contribute by doing no harm. Furthermore, Ports do and can benefit from contributing to the SDGs and since the motive of most port projects is to do no harm, it seems that ports are aiming to be more sustainable due to public and corporate pressure. Since society and corporations are more likely to engage with ports that actively limit their environmental impact.

Ports do take action to contribute to the realisation of the SDGs. From sub-question three it appears that only one of the three, relatively important, SDGs has a substantial amount of port projects that contribute to its realisation. Again, most of the port projects have taken action in the Climate and Energy area of interest. This seems logical, since the port’s operations, traditionally, has a

substantial amount of pollution. Strangely, one of the core aspects of port, its infrastructure, does not appear to be as important.

From the results it also appears that the actionability of the port projects ,mostly, are external. This means that the port projects are typically organized with different entities. This can be seen as a good aspect, since sustainable development on a global scale can only be achieved if multiple entities work together. Also on a regional and national level, the impact of the port projects are likely to be higher when multiple entities work together.

Another problem with the port projects is that, for most projects, there are no performance indicators available. This means that the impact of the projects cannot be seen. Consequently, it is not possible to see to what extent the ports took action.

So, for the extent that ports have taken action to contribute to the realization of the SDGs, this paper concludes that there is still an insufficient amount of port projects that really contribute to the targets of the SDGs, also because there are no performance indicators available. From the, according to this paper, important SDGs, it appears more attention must be given to the specific targets. The good aspect of the port projects is that most projects have multiple organizations working on it, which can increase the impact of projects and shows that sustainable development is receiving more attention.

### 5.3 Limitations research

The limitations of the literature study is that for the second sub-question, there was limited research available for the benefits of CSR in the port sector. For that reason, the benefits relate to two papers. The major limitation of this article is that it only examines three of the 17 SDGs. This questions the external validity of the conclusion. This can mean that the results are only relevant for the three SDGs used in this article. Secondly, the projects that are evaluated are listed by the WPSP, so the selection of the port projects is influenced by the team of the WPSP that evaluates the projects. This can result into a positive and a selection bias of the projects used. Thirdly, since the port projects are individually looked at, personal errors can be made in the dataset or information can be interpreted differently than others would have.



#### 5.4 Suggestions future research

The main suggestion from this article is that there is more research required to measure the effectiveness of the WPSP projects towards realizing the SDG targets. This paper makes effort in proposing an initial methodology for analyzing the WPSP, which can make it a good starting point for upcoming research. Furthermore, future research should include all SDGs and their targets in order to measure the contribution of the port projects. By analysing the projects with qualitative data analyses programs, the results of future research can become more reliable. Future research should also take a closer look to the motives of the port projects, if these are purely for self gain, or have more altruistic, ethical motives. This can show the intentions of the projects. Furthermore, the WPSP should provide more performance indicators of the projects in order to measure the contribution of the projects.

#### 6 References

- Acciaro, M. (2013). Corporate Responsibility in the Port Sector: The constitutional Theory Perspective. *Proceedings of the 6th Int'l Forum on Shipping Ports and Airports (IFSPA 2013)*, 3.
- Acciaro, M. (2015). Corporate responsibility and value creation in the port sector. *International Journal of Logistics Research and Applications*, 18(3), 291-311.  
doi:10.1080/13675567.2015.1027150
- Bhagwat, P. (2011). Corporate Social Responsibility and Sustainable Development. *Conference on Inclusive & Sustainable growth*.
- Bichou, K., & Gray, R. (2005). A critical review of conventional terminology for classifying seaports. *Transportation Research Part A: Policy and Practice*, 39(1), 75-92.  
doi:<https://doi.org/10.1016/j.tra.2004.11.003>
- Brooks, M. R. (2004). The Governance Structure of Ports. *Review of Network Economics*, 3(2), 168-183.
- Brundtland, G. H. (1987). *World Commission on Environment and Development*. Oxford: Oxford University Press.

- Dahlsrud, A. (2008). How Corporate Social Responsibility is Defined: an Analysis of 37 Definitions. *Corporate Social Responsibility and Environmental*, 1-13. doi:10.1002/csr.132
- del Saz-Salazar, S., & García-Menéndez. (2016). Port expansion and negative externalities: a willingness to accept approach. *Maritime Policy and Management*, 43(1), 59-83. doi: 10.1080/03088839.2015.1032379
- Dinwoodie, J., Tuck, S., Knowles, H., Benhim, J., & Sansom, M. (2012). Sustainable Development of Maritime Operations in Ports. *Business strategy and the Environment*, 21, 111-126. doi:10.1002/bse.718
- Dooms, M., & Macharis, C. (2003). A framework for sustainable port planning in inland ports: a multistakeholder approach. *43rd Congress of the European Regional Science Association: "Peripheries, Centres, and Spatial Development in the New Europe"*. 27th - 30th August 2003, Jyväskylä, Finland, European Regional Science Association (ERSA).
- Du, S., Bhattacharya, C., & Sen, S. (2010). Maximizing Business Returns to Corporate Social Responsibility (CSR): The Role of CSR Communication. *International Journal of Management Reviews*, 12, 8-19. doi:10.1111/j.1468-2370.2009.00276.x
- ESPO. (2018, March 2018). *World Ports Sustainability Program Launched*. Retrieved from ESPO: <https://www.espo.be/news/world-ports-sustainability-program-launched>
- Fremont, A. (2007). Global maritime networks: The case of Mearsk. *Journal of Transport Economics*, 431-442.
- Friedman, M. (1962). *Capitalism and freedom*. Chicago: University of Chicago Press.
- Galbreath, J. (2010). How does corporate social responsibility benefits firms? Evidence from Australia. *European Business Review*, 22(4), 411-431. doi:DOI 10.1108/09555341011056186
- Grewal, D., & Darlow, N. J. (2007). The Business Paradigm for Corporate Social Reporting in the Context of Australian Seaports. *Maritime Economics and Logistics*, 9(2), 172-192. doi:<https://doi.org/10.1057/palgrave.mel.9100178>

- Gupta, A. K., Gupta, S. K., & Patil, R. S. (2005). Environmental management plan for port and harbour projects. *Clean Technology Environment Policy*, 7, 133-141. doi:DOI 10.1007/s10098-004-0266-7
- Hiranandani, V. (2014). Sustainable development in seaports: a multi-case study. *WMU Journal of Maritime Affairs*, 13(1), 127-172.
- Hopwood, B., Mellor, M., & O'Brien, G. (2005). Sustainable development: Mapping different approaches. *Sustainable development*, 13, 38-52. doi:10.1002/sd.244
- International Chamber of Shipping. (2017). *Shipping facts*. Retrieved from International Chamber of Shipping : <http://www.ics-shipping.org/shipping-facts/shipping-and-world-trade>
- Jamali, D., & Mirshak, R. (2007). Corporate Social Responsibility (CSR): Theory and Practise in a Developing County Context. *Journal of Business Ethics*, 72, 243-262. doi:DOI 10.1007/s10551-006-9168-4
- Kates, R. W., Parris, T. M., & Leiserowitz, A. A. (2005). What is sustainable development? Goals, indicators, values and practice. *Environment*, 47(3), 8-21.
- Kolk, A., & Van Tulder, R. (2010). International business, corporate social responsibility and sustainable development. *International business review*, 19(2), 119-225.
- Krishna, I. M., Manickam, V., Shah, A., & Davergave, N. (2017). *Environmental Management: Science and Engineering for industry*. Butterworth-Heinemann.
- Lam, J. S., & Notteboom, T. (2014). The Greening of Ports: A Comparison of Port Management Tools Used by Leading Ports in Asia and Europe. *Transport Reviews*, 34(2), 169-189. doi:10.1080/01441647.2014.891162
- Lam, J. S., & Van de Voorde, E. (2012). Green port strategy for sustainable growth and development. *Transport logistics for sustainable growth at a new level, International Forum on Shipping, Port and Airports (IFSPA)*, 27-30.
- Lehtonen, M. (2004). The environmental-social interface of sustainable development: capabilities, social capital, institutions . *Ecological Economics*, 199-214.

- Moon, J. (2007). The contribution of corporate social responsibility to sustainable development. *Sustainable development*, 15(5), 296-306.
- Notteboom, T. E., & Rodrique, J. P. (2005). Port regionalization: toward a new phase in port development. *Maritime Policy & Management*, 32(3), 297-313.
- Oeyono, J., Samy, M., & Bampton, R. (2011). An examination of corporate social responsibility and financial performance: A study of the top 50 Indonesian listed corporations. *Journal of Global Responsibility*, 2(1), 100-112. doi:10.1108/20412561111128555
- Patrizia, G. (2012). Social performance enhances financial performance: Benefits from CSR. *The Annals of the University of Oradea. Econ. Serv*, 112-212.
- Penrose, E. (1959). *The Theory of the Growth of the Firm*. New York: John Wiley and Sons.
- Peters, R., & Mullen, M. R. (2009). Some evidence of the cumulative effect of corporate social responsibility on financial performers. *Journal of Global Business Issues*, 3(1), 1-14. Retrieved from <https://search.proquest.com/docview/223741070?accountid=13598>
- Port of Rotterdam. (2017). *Toegevoegde waarde en werkgelegenheid*. Retrieved from Port of Rotterdam: <https://www.portofrotterdam.com/nl/de-haven/haven-feiten-en-cijfers/toegevoegde-waarde-en-werkgelegenheid>
- Puig, M., Wooldridge, C., & Darba, R. M. (2014). Identification and selection of Environmental Performance Indicators for sustainable port development. *Marine Pollution Bulletin*, 124-130.
- Sen, S., Bhattacharya, C. B., & Korschun, D. (2006). The Role of Corporate Social Responsibility in Strengthening Multiple Stakeholder Relationships: A Field Experiment. *Journal of the Academy of Marketing Science*, 34(2), 158-166.
- Shan, J., Yu, M., & Lee, C. (2014). An empirical investigation of the seaport's economic impact: Evidence from major ports in China. *Transportation Research Part E: Logistics and Transportation Review*, 69, 41-53. doi:<https://doi.org/10.1016/j.tre.2014.05.010>
- Trozzi, C., & Vaccaro, R. (2000). Environmental impact of port activities. *WIT Transactions in The Built Environment*, 51.

- United Nations. (2015). *Sustainable Development Goals*. Retrieved from Sustainable Development Goals: 17 goals to transform our world:  
<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>
- United Nations. (2016). *The Sustainable Development Agenda*. Retrieved from Sustainable Development Goals: 17 Goals to Transform Our World:  
<https://www.un.org/sustainabledevelopment/development-agenda/>
- United Nations. (2018). *Overview*. Retrieved from United Nations:  
<http://www.un.org/en/sections/about-un/overview/index.html>
- van Zanten, J., & van Tulder, R. (2018). Multinational enterprises and the Sustainable Development Goals: An institutional approach to corporate engagement. *Journal of International Business Policy*, 1-26. doi:<https://doi.org/10.1057/s42214-018-0008-x>
- Verhoeven, P. (2010). A review of port authority functions: towards a renaissance? *Maritime Policy and Management*, 37(3), 247-270. doi:10.1080/03088831003700645
- Weber, M. (2008). The business case for corporate social responsibility: A company-level measurement approach for CSR. *European Management Journal*, 26(4), 247-261. doi:<https://doi.org/10.1016/j.emj.2008.01.006>
- World Business Council for Sustainable Development . (2000). *Corporate Social Responsibility: Making good business sense*. Geneva: WBCSD.
- World Port Sustainability Program. (2017). *About the program*. Retrieved from World Port Sustainability Program: <https://sustainableworldports.org>

## 7 Appendix

### 7.1 A

The UN Sustainability Goals:

1. No poverty
2. Zero hunger
3. Good health and well-being

4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below water
15. Life on land
16. Peace justice and strong institutions
17. Partnerships for the goals

## 7.2 B

*Table 7 Table of the gaps in MNEs related to the SDGs. Source: Van Zanten & Van Tulder (2018).*

|                |               | Actionability  |  |
|----------------|---------------|--|--|
|                |               | Internal   | External   |
| Ethical duties | Avoiding harm | [A] None   | [B] Many<br><ul style="list-style-type: none"> <li>· Deforestation and/or desertification</li> <li>· Poaching</li> <li>· Marine and other water-related ecosystems</li> <li>· Overfishing</li> </ul> |
| Doing good     |               | [C] Few<br><ul style="list-style-type: none"> <li>· Transfer of technologies</li> <li>· Sustainable food production</li> </ul> | [D] Most<br><ul style="list-style-type: none"> <li>· Access to affordable and sustainable transport, housing, energy, financial services, ICT</li> </ul>   |

|  | Actionability   |   |
|--|---|---|
|  | Internal  | External  |
|  | <ul style="list-style-type: none"> <li>· Funding for climate change action in developing countries</li> </ul> | <ul style="list-style-type: none"> <li>· Agricultural productivity of small holders</li> <li>· Cultural and natural heritage and diversity</li> <li>· Healthy and sufficient food for those on low incomes</li> </ul> |

*Table 8 List of the SDG targets for the SDG 9, 14 and 15. Note: the target id number is corresponding with the SDG.*

| Target ID | SDG targets   |
|-----------|---|
| 9.1       | Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all  |
| 9.2       | Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries   |
| 9.3       | Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets   |
| 9.4       | By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities |
| 9.5       | Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and  |

---

development workers per 1 million people and public and private research and development spending

- 9.6 Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States 18
- 9.7 Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities
- 9.8 Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020
- 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution
- 14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans
- 14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels
- 14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics
- 14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information
-



- 
- 14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation
- 14.7 By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism
- 14.8 Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries
- 14.9 Provide access for small-scale artisanal fishers to marine resources and markets
- 14.10 Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of The Future We Want
- 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
- 15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally
- 15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world
-

---

|       |   |
|-------|---|
| 15.4  | By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development  |
| 15.5  | Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species  |
| 15.6  | Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed  |
| 15.7  | Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products  |
| 15.8  | By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species  |
| 15.9  | By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts   |
| 15.10 | Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems  |
| 15.11 | Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation |
| 15.12 | Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities  |

---

*Table 9 This table shows which port projects has performance indicators or not.*

| Port Projects (23 total)                  | Perf. indicators available (y/n) |
|---|----------------------------------|
| Port links project Barcelona              | No                               |
| Port of Gothenburg - Wetland at Torsviken | No                               |

|   |       |
|---|-------|
| Port of Vancouver - International Collaboration on Vessel Emissions Reduction           | No    |
| Port of Barcelona - Air quality improvement plan  | No    |
| Port of Le Havre - SAFE SECA project  | Yes   |
| Ports of Los Angeles and Long Beach - Clean Air Action Plan 2017                        | Yes   |
| Port of Antwerp - CIVITAS PORTIS project  | No    |
| Port of Guangzhou - Onshore Supply Power project  | No    |
| Port of Amsterdam - MISA software application   | No    |
| JNPT - Antwerp Port Training and Consultancy Foundation                                 | No    |
| Port of Auckland - DC Micro grid Research project                                       | No    |
| Port of Antwerp - CLINSH project  | No    |
| Port of Antwerp- PIN project  | No    |
| Ports of Stockholm – Carbon footprint, energy optimization and sustainability reporting | Yes   |
| Port of Açu – Vila da Terra project   | No    |
| Port of Khalifa – Coral Reef protection   | No    |
| Ports of Auckland – Zero Emissions 2040   | No    |
| MIT Panama S.A. – Carbon footprint reduction  | Yes   |
| MIT Panama S.A. – Gender Equity Initiatives   | Yes   |
| Fremantle Ports – Fairy Tern Conservation Sanctuary                                     | Yes   |
| Port of Kobe - Environmental Measures in Reclamation Projects                           | Yes   |
| Port of Kristiansand – Shore power supply for cruise ships                              | No    |
| Port of Amsterdam – Integrated Green Energy Solutions (IGES)                            | Yes   |
| Total Yes   | 8     |
| Total No  | 15    |
| Percentage Yes of 23 projects   | 34.8% |
| Percentage No of 23 projects  | 65.2% |

*Table 10 Code words per target*

| Target ID | Code 1         | Code 2            | Code 3      | Code 4       | code 5     | code 6 | code 7 | code 8 |
|-----------|----------------|-------------------|-------------|--------------|------------|--------|--------|--------|
| 9.1       | infrastructure | development       | human       | access       | well-being |        |        |        |
| 9.2       | sustainable    | industrialization | share       |              |            |        |        |        |
| 9.3       | access         | enterprises       | financial   | services     |            |        |        |        |
| 9.4       | infrastructure | industry          | sustainable | technologies |            |        |        |        |

|       |                 |                |               |               |               |               |          |            |  |
|-------|-----------------|----------------|---------------|---------------|---------------|---------------|----------|------------|--|
| 9.5   | scientific      | innovation     | industrial    | sectors       | research      |               |          |            |  |
| 9.6   | sustainable     | infrastructure | developing    | resilient     | countries     |               |          |            |  |
| 9.7   | technology      | research       | innovation    | developing    | countries     |               |          |            |  |
| 9.8   | access          | internet       | information   | technologies  | communication |               |          |            |  |
| 14.1  | marine          | land-based     | activities    | pollution     |               |               |          |            |  |
| 14.2  | sustainable     | manage         | protect       | marine        | coastal       | ecosystems    |          |            |  |
| 14.3  | impact          | ocean          | acidification | cooperation   |               |               |          |            |  |
| 14.4  | regulate        | fishing        | management    | sustainable   | fish          |               |          |            |  |
| 14.5  | conserve        | coastal        | marine        | areas         |               |               |          |            |  |
| 14.6  | subsidies       | overfishing    | overcapacity  | illegal       | fishing       |               |          |            |  |
| 14.7  | sustainable     | marine         | developing    | countries     | resources     | states        |          |            |  |
| 14.8  | scientific      | research       | marine        | ocean         | biodiversity  | knowledge     | capacity | technology |  |
| 14.9  | access          | artisanal      | marine        | markets       | fishers       | resource      |          |            |  |
| 14.10 | conservation    | sustainable    | ocean         | international | law           |               |          |            |  |
| 15.1  | terrestrial     | inland         | freshwater    | ecosystems    |               |               |          |            |  |
| 15.2  | sustainable     | management     | forests       | deforestation | afforestation | reforestation |          |            |  |
| 15.3  | desertification | land           | degraded      |               |               |               |          |            |  |
| 15.4  | mountain        | ecosystems     | biodiversity  |               |               |               |          |            |  |
| 15.5  | natural         | biodiversity   | threatened    | habitat       | species       |               |          |            |  |
| 15.6  | genetic         | benefits       | access        | sharing       | resources     |               |          |            |  |
| 15.7  | poaching        | trafficking    | species       | flora         | fauna         |               |          |            |  |
| 15.8  | measures        | species        | ecosystems    | alien         | invasive      |               |          |            |  |
| 15.9  | ecosystems      | biodiversity   | national      | local         | planning      |               |          |            |  |
| 15.10 | financial       | biodiversity   | ecosystems    | resources     |               |               |          |            |  |
| 15.11 | sustainable     | resources      | management    | forest        |               |               |          |            |  |
| 15.12 | global          | combat         | poaching      | trafficking   | protected     | species       | support  |            |  |

### 7.3 C

Figure two shows the content of the project description of the Zero Emissions 2040 project of the ports of Auckland. To show how the data is accumulated an example is displayed here. The project, according to the WPSP, belongs to three areas of interest: Climate and Energy, Community outreach and port-city dialogue and Resilient Infrastructure. For each area a new column was made. The basic information above the targets is retrieved from the description and the website of the WPSP. Then, the description of the project is studied and marked to a target if the targets its description, with importance to the code words, is linked to project. Furthermore, not every target is that is linked to the project is of importance for all the areas of interest the project exists in. So, by personal observation, the relevant targets are marked for the area(s) of interest it is relevant too.

Ports of Auckland (POAL) has an ambitious goal to become a zero emissions port by 2040. To get started on this journey we partnered with Enviro-Mark Solutions and are using the Certified Emissions Measurement and Reduction Scheme (CEMARS®) to measure and manage our greenhouse gas emissions. We are the first port in New Zealand to become a CEMARS® certified organisation.

We have measured direct and indirect emissions associated with our business and those of our subsidiaries. We have also commenced a project to compile a baseline emissions inventory of trucks visiting the port. A baseline of emissions of other freight modes will follow. In 2017 we completed a feasibility study for Cruise Vessel Emission Reductions Technologies.

<https://sustainableworldports.org/project/ports-of-auckland-zero-emissions-2040/>

1/5

7/7/2018

Ports of Auckland – Zero Emissions 2040 – World Port Sustainability Program

The emissions reduction plan is currently underway. Our strategy for reducing emissions is to first improve our energy efficiency and then to implement further renewable energy and zero emission technologies, such as delivering zero-emission technologies for our container handling equipment and harbour fleet vessels.

Efficiency improvements are being implemented through behavioural changes, upgrades of assets to more energy efficient options, and through research projects such as the DC Microgrid project to develop more energy efficient system particularly for warehouses. Behavioural changes will be delivered through training and by leveraging our improved data analytics capability at the port. The data analytics team is turning our data into useful information that can be used to raise awareness, and readily measure and manage operational efficiencies at the port.

We are committed to developing partnerships to achieve deliver our zero emissions programme. One such partner is EECA, the Energy Efficiency and Conservation Authority in New Zealand. Through this partnership we have delivered a port-first of LED Floodlighting which is expected to reduce electricity consumption by 7%.

The zero emission programme is part of our strategy to achieving our vision to become a leading sustainable port at a global level. In setting this vision and goal, POAL has recognised the leadership role it can play in driving change in the ports and shipping industry both locally and globally. POAL is a city port, and believes there is a need to exceed the regulatory requirements and is seeking to improve the environment for our community around the port.

*Figure 3 project description of the Zero Emissions 2040 project. Source:*

Table 8 The accumulated data from the port projects portfolio description.

|                                  | Zero Emissions 2040   | Zero Emissions 2040   | Zero Emissions 2040   |
|----------------------------------|---|---|---|
| Title portfolio project          | Ports of Auckland – Zero Emissions 2040   | Ports of Auckland – Zero Emissions 2040   | Ports of Auckland – Zero Emissions 2040   |
| Port                             | Ports of Auckland   | Ports of Auckland   | Ports of Auckland   |
| Country                          | New Zealand   | New Zealand   | New Zealand   |
| Authority                        | Ports of Auckland   | Ports of Auckland   | Ports of Auckland   |
| Continent                        | Oceania   | Oceania   | Oceania   |
| Area of interest                 | Climate and energy  | Community outreach and port-city dialogue   | Resilient Infrastructure  |
| Issue                            | Emissions from port activities  | Emissions from port activities  | Emissions from port activities  |
| Implemented solution             | First to monitor the emissions produced and then implementing the emissions reduction plan by improving energy efficiency and then to implement further renewable energy and zero emission technologies | First to monitor the emissions produced and then implementing the emissions reduction plan by improving energy efficiency and then to implement further renewable energy and zero emission technologies | First to monitor the emissions produced and then implementing the emissions reduction plan by improving energy efficiency and then to implement further renewable energy and zero emission technologies |
| Year of publication              | 2017  | 2017  | 2017  |
| Perf. indicators available (y/n) | No  | No  | No  |
| target 9.1                       | x   |   | x   |
| target 9.2                       | x   | x   | x   |
| target 9.3                       |   |   |   |
| target 9.4                       | x   |   | x   |
| target 9.5                       | x   |   | x   |
| target 9.6                       |   |   |   |
| target 9.7                       | x   | x   | x   |
| target 9.8                       |   |   |   |
| target 14.1                      | x   | x   | x   |
| target 14.2                      |   |   |   |
| target 14.3                      |   |   |   |
| target 14.4                      |   |   |   |
| target 14.5                      |   |   |   |
| target 14.6                      |   |   |   |
| target 14.7                      |   |   |   |
| target 14.8                      |   |   |   |
| target 14.9                      |   |   |   |

---

|   |   |   |   |
|---|---|---|---|
| target 14.10                                |   |   |   |
| target 15.1                                 |   |   |   |
| target 15.2                                 |   |   |   |
| target 15.3                                 |   |   |   |
| target 15.4                                 |   |   |   |
| target 15.5                                 |   |   |   |
| target 15.6                                 |   |   |   |
| target 15.7                                 |   |   |   |
| target 15.8                                 |   |   |   |
| target 15.9                                 |   |   |   |
| target 15.10                                |   |   |   |
| target 15.11                                |   |   |   |
| target 15.12                                |   |   |   |
| Motive - Do no harm                         | x | x | x |
| Motive - Doing Good                         |   |   |   |
| Internal operability -<br>doing it alone    |   |   |   |
| External operability -<br>doing it together | x | x | x |

---