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## Learning from ASDP Indonesia Ferry in Adapting Climate Change

Teguh Widodo<sup>1\*</sup>, Abdullah Qiqi<sup>2</sup>, Muhammad Athar Ismail Muzakir<sup>3</sup>, Mario Ekoriano<sup>1</sup>,  
Hanief Arief<sup>1</sup>, Melania Hanny Aryantie<sup>1</sup>, Choiruddin Kamaruddin<sup>1</sup>

<sup>1</sup> National Research and Innovation Agency of Indonesia (BRIN),

<sup>2</sup> Indonesian Ministry of Labour,

<sup>3</sup> National Research and Innovation Agency of Indonesia (BRIN),  
Syekh -Yusuf Islamic University, Tangerang, Indonesia,

\* Corresponding author: email [tegu030@brin.go.id](mailto:tegu030@brin.go.id)

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**Abstract:** ASDP Indonesia Ferry Company (PT. ASDP) is a state-owned company that transports water in seas, lakes, and rivers. In vessel operations, the ASDP requires more energy. Consequently, the more energy supplied, the more emission results. In addition, ASDP is potentially harmful in polluting sea water, lakes, and rivers because if passengers are not aware of throwing garbage as long as they are on board, they will pollute the water. Based on the Indonesian provision, the country should reduce carbon emissions by 27% without supporting overseas institutions, and 41% by supporting donors. This requires strict effort because the country needs more energy to grow economically, while the country has to reduce consumption. Another strategy is required to maintain growth. It appears from individual awareness that they work in the ASDP. They do initiatives in terms of reducing CO<sub>2</sub> emissions and pollution. This study aimed to explore how ASDP workers are aware of reducing CO<sub>2</sub> emissions and greenhouse gases by reducing their causes. This study used in-depth interviews to obtain information about how to build



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awareness among them and how they plan green ASDP. Through their initiative, they arranged the green ASDP Plan. It consists of green management, ports, and shipping. They developed a roadmap green ASDP over 10 years. Every year, they make targets that are proofed by certificates related to any greens, such as ISO 14001, ISO 5000, greenship certificate, etc.

**Keywords:** Learning ASDP, Indonesia Ferry, Climate Change

## 从适应气候变化的 ASDP 印度尼西亚渡轮中学习

**摘要：**印度尼西亚 ASDP 渡轮公司 (PT. ASDP) 是一家国有公司，为海上、湖泊和河流提供水上运输服务。

在船舶运营中，ASDP 需要更多的能源。结果是，供应的能源越多，产生的排放量就越多。此外，ASDP 还可能污染海水、湖泊和河流，因为如果乘客在船上时没有意识到扔垃圾，他们就会污染水。根据印度尼西亚的规定，该国在不支持海外机构的情况下应减少 27% 的碳排放，

在支持捐助者的情况下应减少 41% 的碳排放。这需要付出巨大的努力，因为该国需要更多的能源来发展经济，而该国必须减少消费。它需要另一种策略来保持增长。从他们在 ASDP 作的个人意识来看。

他们在减少二氧化碳排放和污染方面采取主动行动。本研究旨在探索 ASDP 工人如何通过减少任何导致二氧化碳排放和温室气体排放的原因来提高减少二氧化碳排放和温室气体排放的意识。本研究采用深入访谈来获取有关如何在他们中建立意识以及他们如何规划绿色 ASDP 的信息。

他们主动制定了绿色 ASDP 计划。该计划包括绿色管理、绿色港口和绿色航运。他们制定了为期 10 年的绿色 ASDP 路线图。他们每年都会制定目标，并通过与任何绿色相关的证书（如 ISO 14001、ISO 5000、绿色船舶证书等）来证明这一点。

**关键词：**学习 ASDP、印度尼西亚渡轮、气候变化

### 1. Introduction

Global climate change affects ocean waves, which ultimately disrupt ship operational schedules owing to high waves, changes in wind direction that arrive, and the emergence of tidal waves (Shen et al., 2022). One of the causes of this climate change is the increase in CO<sub>2</sub> emissions (Chaichaloempreecha et al., 2022) (Beusch et al., 2022)—and CO<sub>2</sub> emissions occur because of industrial activities and transport (Kuenemann & Fourches, 2017) (Moussa, 2021) (Wang, et al, 2022), (Vanda, et al. 2018).

This condition makes the PT ASDP and its employees committed to reducing CO<sub>2</sub> emissions and other pro-environmental policies. In addition, there are several other external factors that serve as a reference to the background of why the green ASDP roadmap is needed. First, the government has a target of reducing greenhouse gas emissions by up to 29% by 2030. This is a national commitment to addressing global climate change in order to achieve the

objectives of the Paris Agreement on the United Nations Framework Convention on Climate Change (Sarkodie, Ahmed, & Owusu, 2022). This is stated in Presidential Regulation No.98 of 2021, concerning the Implementation of The Economic Value of Carbon for the Achievement of nationally set contribution targets and Control of Greenhouse Gas Emissions in National Development.

GHG emission control is carried out with policies in national, central, and regional development, as well as from, for, and by the central and regional governments, business actors, and communities to move towards the direction of low carbon emissions and climate-resilient development by 2050. In other words, ASDP as a government-owned business entity has a role in contributing to environmental sustainability; in particular, ASDP is engaged in port and crossing, which is undeniably very vulnerable to the environmental impacts of its business.

Second, in an effort to adapt to climate change as part of development planning, the government has mandated 17 ministries/institutions (K/L) to contribute to increasing resilience and reducing vulnerability to the risk of climate change. One of these K/Ls is the Ministry of Transportation, which, in this case, is a company under the Ministry of State-Owned Companies (SOC), but related to its business in the transportation sector, ASDP is within the policy and regulatory corridor of the Ministry of Transportation.

In the Climate Resilience Development Policy Paper 2020-2045 stated that the Ministry of Transportation has a role in handling global climate change related to the marine and coastal sectors. The role of the Ministry of Transportation related to the marine sector includes several aspects, one of which is the infrastructure aspect, namely, by providing and maintaining infrastructure to reduce the potential risks and impacts of climate change, especially on shipping and crossing activities. One of the roles of the Ministry of Transportation is the responsibility for the ASDP. It is a business partner in the crossing and port sector that needs to implement these aspects to reduce vulnerability to global climate change.

Finally, there is a direction from the Ministry of SOC that requires every SOC to implement the Corporate Social Responsibility program (CSR) by complying with the provisions stipulated in BUMN Ministerial Regulation No.5 of 2021 concerning the SOC's Social and Environmental Responsibility Program. It is the company's commitment to sustainable development by providing benefits to the economy, society, environment, law, and governance with principles that are more integrated, directed, measurable, accountable, and part of the company's business approach. It needs to be implemented by the ASDP Indonesia Ferry because it is in line with the company's target to become a company that prioritizes environmental aspects as currently being

prepared, namely the Green ASDP Roadmap.

In realizing a sustainable company, there are several environmental-based approaches that need to be considered. The first step is to determine the energy efficiency of the company. The second is to control carbon emissions generated by the company's work operations. The third is to manage water use and the fourth is to manage the waste generated from work operations in the company.

The ASDP has 35 ports and 160 ferries managed by a company for these business activities in Indonesia. Most use resources, including electricity and fossil fuels, in the form of diesel oil as the main energy source. The use of electricity and fossil fuels is one of the most important sources of energy and emits carbon emissions (Holland, 2022); (Li et al., 2022) (Deo & Prasad, 2022). In addition, the use of electricity and fossil fuels also incurs the greatest operational costs. This is one of the aspects that needs to be considered in an effort to realize the Green ASDP/Green Company.

To realize the Green ASDP plan, a development roadmap is needed, starting from the basic principles that must be met, considering the technical and regulatory aspects, aspects of value creation for companies, stages of development, and work programs that can be implemented immediately so that companies can implement sustainable environmental standards or Green Company (Sztorc, 2022).

All employees assessed the aspects that cause CO<sub>2</sub> emissions. They are determined to reduce these emissions with collective consciousness from the executive level to the ASDP leadership element. Starting from branch leaders to central management, this mandate was implemented. The ASDP also prepares climate change adaptation patterns by carrying out various efficiencies ranging from the use of water and energy (electricity and diesel). The ASDP also prepares a better waste management scheme. How do employees prepare their

ASDP planning? What are the plans? What targets should be achieved in planning?

This study was divided into four parts. The first part of the Introduction explains the urgency of the green ASDP and the formulation of the problem. The second part of the theoretical review explains the concept of the green ASDP and the study of climate change and its consequences. The third section describes the research methods, including the technicality of the data collection and analysis. The fourth part of the discussion explains the research results, and the last part is a closing note consisting of conclusions and recommendations.

## 2. Review

Green ASDP is another term used by green companies. Currently, green companies are mandatory because they are related to the sustainability of their businesses, where by managing environmental factors, the company contributes to maintaining environmental sustainability (Borge-Diez et al., 2022). Then, the company will get a good image from the public (the public, investors, and other parties), and it can also reduce expenses because by applying the "Green" concept, the company will save more on the resources used (Moshood, et al, 2021).

The Green ASDP concept is a concept that will be applied by PT ASDP Indonesia Ferry, where the company will not only focus on profits or profits for the company but also consider the environmental impact that will be produced by the company. Therefore, the importance of implementing the ASDP Concept is that the environment around the business remains controlled and not polluted by the influence of operational activities carried out by the company.

The commitment to environmental sustainability carried out by the PT ASDP Indonesia Ferry was realized through the preparation of this Green ASDP Roadmap. PT ASDP Indonesia Ferry in its Sustainability Report explained that it takes active responsibility in protecting the environment by complying with laws and

regulations and maintaining environmental sustainability.

The Green ASDP Roadmap is composed of three scopes of discussion: Green Management, Green Port, and Green Shipping. These three scopes are important elements in achieving the targets set in the Green ASDP Roadmap. The definitions of these three scopes are outlined below:

a. Green Management is a set of standard processes and practices that helps companies improve the sustainability of their business by planning, conducting, evaluating, and regulating environmental policies. (International Conference of Management Science, 2017). There are three levels in the implementation of a Green Management system by a company: the development of environmental rules, system planning for the application of rules, and their application. Green Management is also an integrated environmental management strategy that includes the development of organizational structures and systems in green competence by implementing and complying with all regulations on environmental management, including raw material management, waste treatment, effective use of natural resources, use of production technology that produces minimal waste, and implementing environmental awareness commitments for all employees in their organizations. (Qian, Liang, Liu, Zhang, & Liu, 2022). In addition, in the discussion of Green Management, there is a discussion about green buildings, where green building is a new building that is planned and implemented or built has been built by taking into account environmental factors (Indonesian Engineers Association, 2016). Every company, regardless of the type of business, plays a significant role in improving its environment. Any policy that the company implements must be oriented towards the natural environment or Green Management. In other words, Green Management generates profits by committing to the principles of environmental sustainability. In the context of the preparation of the Green ASDP

Roadmap, which is the scope of analysis for Green Management, namely: (a) The Organizational Structure of PT ASDP Indonesia Ferry and (b) Office Buildings (both head offices and regional offices within the scope of the company).

b. Green Port is a port term that pays attention to social, economic, and environmental aspects in its management and operations (Ekmekçioğlu, Ünlügençoğlu, & Çelebi, 2022); (Hanson & Nicholls, 2020) (Busch, et al, 2019). The definition issued by the International Association of Port and Harbour (IAPH) is related to green ports, also called sustainable ports. The port is given authority together with port users, proactive, and responsible for developing and operating the port, based on the growth strategy of the (Green Economy), which works with the philosophy of nature and involves the participation of port stakeholders, starting from the long-term vision of the area where the port is located and from a privileged position in the logistics chain, thus ensuring development that anticipates the needs of future generations, for their own benefit and the prosperity of the area it serves. In the context of the preparation of the Green ASDP Roadmap, which is the scope of analysis for the Green Port, namely, in the Port Branches of PT ASDP Indonesia Ferry.

c. Green shipping is a concept created to reduce the environmental impact of shipping activities in water (Domachowski, 2021) (Busch et al., 2019)(Lister, Poulsen, & Ponte, 2015). To become a green shipping fleet, several criteria are required, including shipping that can reduce exhaust emissions, ship waste disposal, hull water treatment, wastewater treatment, and the application of environmentally safe underwater coatings. In the context of the

preparation of the Green ASDP Roadmap, which is the scope of analysis for Green Shipping, namely, on the fleet of ships owned by PT ASDP Indonesia Ferry and its subsidiary (PT Jembatan Nusantara).

### 3. Methods

In preparing the Green ASDP Roadmap, several steps have been taken that have been adjusted to the strategic steps that need to be carried out in the preparation of the study. The analysis stage is carried out based on the steps of the approach and methodology in the preparation of the Green ASDP Roadmap. Desk studies of related documents are part of the *first stage of analysis*. Desk studies were carried out, including the initial identification of a review of supporting theories, especially related to carbon emissions and energy consumption, secondary data in the form of an overview document data of PT ASDP Indonesia Ferry as one of the baseline data for the company's condition.

The next identification is the policy of laws and regulations as a form of national commitment to both environmental and energy issues as well as applicable international regulations. These regulations are then analyzed to identify and map regulations or policies that support the reduction of the impact of environmental issues from the company's activities.

The *benchmark* analysis stage is part of a desk study of companies that have adapted to environmental issues in their activities. *Benchmarks* are not only used for comparisons in terms of *green management*, including comparisons for *green ports* and *green shipping*. This stage aims to obtain supporting components that can be applied to reduce environmental issues and utilize renewable energy in companies and across industries.



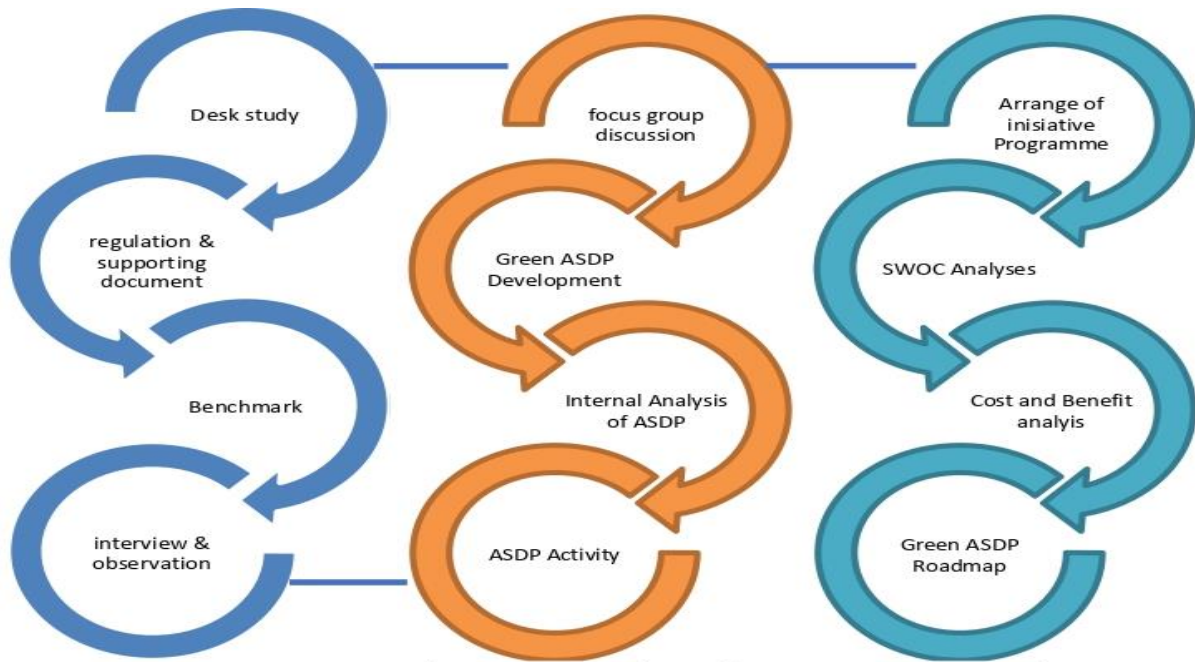


Figure 1 Staging of green ASDP Roadmap  
Source: Analysis Results, 2022.

The second stage of analysis was a field survey activity, which included observation activities and in depth interviews with stakeholders related to green management, green ports and green shipping. The information that is expected to be collected is related to office management activities, activities at the ASDP port, activities inside the crossing ship, and quality. This information needs to be supported by related data.

Next, the third stage of analysis is to conduct an internal analysis of the company to determine the carbon emissions produced, energy consumption, water management, and waste management of each activity in offices, ports, and crossing ships. The preparation of the directive can involve stakeholders in the PT ASDP Indonesia Ferry by conducting a *Forum Group Discussion* (FGD).

The fourth stage of the analysis is an analysis supports the preparation of program initiatives that support the development of the Green ASDP. SWOC analysis and *cost & benefit* analysis were used to identify program initiatives. SWOC analysis was used to obtain strategies in accordance with the development direction of the Green ASDP and its program

derivatives. The directions of goals, policies, and steps are prepared with planning and strategic stages that have achievement targets. The strategic planning direction can be a *guide for* the implementation of the Green ASDP for the next 10 (ten) years. Figure 1 shows all the stages.

## 4. Results

### 4.1. Strategic Pillars of Green ASDP

The strategic pillar is a step supporting the achievement of the policy direction and objectives of the Green ASDP, which is trapped in the roadmap document. The pillar will be more specific regarding the steps that need to be achieved, based on aspects related to sustainable environmental handling.

### 4.2. Improved Air Quality

It is a strategic plan that will be carried out to improve air quality to reduce emissions in the company's environment. This strategic step will be an umbrella step in the formation of Green ASDP programs. The strategic measures of the air quality improvement pillars were as follows: (a) periodic inventory of Greenhouse Gas emissions, (b) optimizing the use of

facilities to reduce Greenhouse Gas emissions, and (c) optimizing the greening area in the company's environment.

#### 4.3. Efficiency and Application of Renewable Energy

It is a strategic plan that will improve the efficiency of the energy currently used by the company and implement renewable energy. Currently, the company uses renewable energy, one of which is Solar Energy (*Solar Panels*) at the port. The strategic measures for the pillars of efficiency and application of renewable energy are as follows:

- a. Maximizing the use of renewable energy in the company's operational activities,
- b. Increase scope coverage in energy efficiency and renewable energy applications, and
- c. Adjust the technology of fuel energy use to applicable regulations.

#### 4.4. Clean Water Efficiency

It is a strategic plan that will improve the efficiency of clean water used by the company in its operational activities. The new building plan includes technological planning to reduce the consumption of clean water and its treatment. Another operational activity that should be considered is related to clean water in ports and ships. The strategic steps of the pillars of clean water efficiency are as follows.

- a. Implement alternative sources of clean water to preserve groundwater, and
- b. Optimizing the use of clean water management technology.

#### 4.5. Waste and Waste Management

This is a strategic plan that will be implemented in waste and waste management. Waste and waste management derived from all operational activities of the company are currently handled and cooperate with third parties. However, in Government Regulation Number 22 of 2021 and Regulation of the Minister of Environment for Forestry Number 68 of

2016, a company is obliged to manage waste independently. Therefore, the strategic steps of the waste and waste management pillars are as follows:

- a. Improving #R-based waste and waste management (*Reduce, Reuse and Recycle*)
- b. Conducting waste management independently in the company's environment, and
- c. Optimizing partnerships with partners and stakeholders to support waste and waste management.

#### 4.6. Noise Reduction

It is a strategic plan that will be implemented to reduce noise caused by the company's operational activities. The scope of operational activities includes office and port activities. The strategic step is to mitigate the sources of noise in a company's environment.

#### 4.7. Quick wins

The *Quick Wins* plan is a *milestone* in itself to show the program or action of activities in the near future. In the ASDP *Roadmap*, a program that includes *quick wins* is for a period of 6 (six) months or implemented in 2022. The implementation of *quick wins* is part of the commitment in the Green ASDP *Roadmap* and can generate *awareness* including initiating the reputation creation of the program.

#### 4.8. Program 1: Green ASDP Socialization in the corporate environment

The socialization program related to Green ASDP is an important step in creating *awareness* of the implementation of a sustainable environment in the company's environment. The socialization of the Green ASDP includes efforts to improve air quality, energy efficiency, clean water efficiency, waste and waste management, and reduce noise. Socialization was carried out in the environment of the head office, ports, and crossing ships.

As a start of socialization, it can be started at the head office, Merak and Bakauheni Ports, and crossing ships owned by PT ASDP Indonesia Ferry that pass through the two ports. Socialization is part of the programme for the scope of *Green Management*, *Green Port* and *Green Shipping*.

#### **4.9. Program 2: Reduction of the use of plastic bottles in the corporate environment**

The program to reduce the use of plastic bottles is part of a follow-up to the Green ASDP socialization program. The plastic bottle reduction campaign is part of *the* creation of awareness and is supported by a program to provide refillable gallons of water and drinking bottles for employees at the head office. One form of reducing plastic bottles can be done, including if there is a meeting or event activity of the company, by utilizing refillable drinking water.

#### **4.10. Program 3: Greening in the Merak Port area**

Based on the results of field visits, Merak Port has a minimal greening area, while from the reference that the Port has at least 11% of the greening area of the total area. The Merak Port target as one of the ports that is a candidate for the *Green Port award*, can be started with the initiation of greening activities at Merak Port in 2022. The greening area can be the distribution of shade trees and pots.

#### **4.11. Program 4: Garbage cleanup on the beach around Bakauheni Port**

The Bakauheni Port is a strategic port owned by the company. The direction of Bakauheni Port as one of the candidates for the *Green Port* award is increasingly supporting the need for a program that is in line with this target. Based on the information obtained, there are community empowerment programs that have been carried out by the company, one of which is around the port, such as planting mangrove

trees and waste management plans involving the surrounding community at bakauheni port. In line with the program plan, the garbage cleanup program on the beach around the Bakauheni Port can support community empowerment activities. The impact of the program can be felt as part of waste management to reduce environmental damage, and can lead to a good reputation for the company.

#### **4.12. Planning program of green ASDP**

The Green ASDP program plan includes considerations that have been conveyed in the potential implementation of the previous chapter. The program plan is divided into the scope of *Green Management*, *Green Port* and *Green Shipping*. The program has been adjusted to the strategic planning direction, so that the policy direction and strategic steps have become a reference for these programs. The phasing of the Green ASDP *Roadmap* which already has a target, is in line with programs that support the achievement of these targets, including determining the timing of the program's implementation.

#### **4.13. Role Sharing**

Based on the Organization and Work Procedures Document of the Head and Regional Office of the PT ASDP Indonesia Ferry (KD. 75/ HK.001/ ASDP-2021), the company has the intention and purpose of connecting the community and markets through crossing services, integrated ports, *waterfront* tourist destinations, emphasizing operational excellence, developing the economy through logistics services and tourist destinations, and prioritizing safety in carrying out its services. To carry out the main duties of the company, there is an organizational structure at both the head office level and representatives (Branch and Regional).

The division of roles in the Green ASDP, which is part of operational excellence that pays attention to a sustainable environment, is adjusted to the existing role in the organizational structure. The role of each directorate and division



considers the scope of duties and authorities in implementing the Green ASDP Roadmap program. This is part of the company’s commitment to the sustainability of ASDP Hijau in order to build environmental awareness at all levels and operational activities.

The Directorate of Planning and Development has duties and functions to direct and supervise the implementation of corporate planning activities, business strategy development and strategic innovation, such as the Green ASDP Roadmap, which can be one of the company's challenges to the environment. The Strategic Innovation Division mandates the planning, implementation, and direction of innovation development to increase the added value of a company, one of which focuses on the environment and renewable energy. *The Green ASDP Roadmap* is one of the breakthroughs of the Strategic Innovation Division, both in the planning, implementation, and program supervision stages for a sustainable environment. Therefore, coordination between directorates and divisions is important so that implementation can be implemented properly.

**4.14. Role in Green Management**

Programs within the scope of *Green Management* include structuring company regulations related to the environment and company management to create *awareness* of the company's culture for a sustainable environment for the management of buildings owned by the company. These programs need to be handled by divisions in accordance with their duties and functions based on the organization and work procedures of the company’s head and regional offices.

Table 1 | Role / Stakeholders of *Green Management*

No	Directory	Division
1	Main Directorate	Corporate Secretary Enterprise Management System

2	Directorate of Planning & Development	Corporate Planning Division Strategic Innovation
3	Directorate of Engineering & Facilities	Safety, Health & Environment Quality Control
4	Directorate of HR Corporate Services	Law & HR Management Property & General

Source: Analysis Results, 2022.

**4.15. Role in Green Port**

Programs within the scope of *Green Port* include operational management that impacts the environment and handling or mitigating sources of environmental impact to the use of renewable energy at ports. The existence of a phasing direction in the Green ASDP Roadmap to achieve *Green Port* in accordance with the criteria and the role and coordination between divisions is very important to achieve this target.

Table 2 | Role/ Stakeholders of *Green Port*

No	Directorate	Division
1	Main Directorate	Corporate Secretary
2	Directorate of Planning & Development	Strategic Innovation
3	Directorate of Engineering & Facilities	Safety, Health & Environment Quality Control Port Optimization & Management
4	Directorate of Commercial & Service	Operational
5	Directorate of HR & Corporate Services	Property & General

Source: Analysis Results, 2022.

**4.16. Role in Green Shipping**

Programs within the scope of *Green Shipping* include those related to the use of low-emission fuels and technological adjustments on board ships to counteract the environmental impact of crossing activities.

The program is handled by a division in accordance with its duties and functions in the operational activities of crossing ships.

Table 3 | Role / Stakeholders of *Green Shipping*

No	Directorate	Divided
1	Main Directorate	Corporate Secretary
2	Directorate of Planning & Development	Strategic Innovation
3	Directorate of Engineering & Facilities	Safety, Health & Environment Fleet Optimization & Management
4	Directorate of Commercial & Service	Operational

Source: Analysis Results, 2022.

## 5. Conclusion

In the *roadmap*, there are also directions related to the optimization of policy instruments to become the basis for implementing a sustainable environment within the company. The *Board of Directors* (BoD) plays a role in directing policy commitments and creating *awareness* in the company environment related to Green ASDP, including its components. The policy then becomes part of the commitment, which can be stated in the form of regulations or company regulations. Therefore, all policymaking directions, both for the scope of *Green Management*, *Green Port* and *Green Shipping* have the role of the BoD ranks, Corporate Secretary, Corporate Management Systems Division and Legal Division (Directorate of HR and Corporate Services). Further division of roles will be adjusted to the scope of the Green ASDP, because there are different duties and functions between the responsibilities of the company's operational activities.

The ASDP Indonesia Ferry (Persero) can focus on several aspects to improve company performance and support business sustainability. Some strategies have been proposed: (1) Service Improvement and Innovation by fleet development, digitalization, and improving the quality of customer service. (2) Sustainability and eco-friendliness by reducing emissions, managing waste, and using renewable energy. (3)

Infrastructure development by upgrading ports and using information technology.

By implementing these strategies, the PT. The ASDP Indonesia Ferry can increase competitiveness and operational efficiency, and support the green company's goals.

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