Stakeholder Involvement Strategy

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1. Introduction

The transition toward sustainable logistics and energy systems has become a pressing priority in light of growing environmental concerns, policy mandates, and the evolving needs of regional economies. This report, prepared as part of Work Package 2 of the Green Supply Chains (GSC) project, focuses on developing a comprehensive stakeholder involvement strategy aimed at harmonizing port electrification and energy transition strategies with regional logistics demands. By fostering collaboration and creating synergies, the report seeks to align the environmental and operational objectives of ports with the broader logistical and energy needs of their surrounding regions. The primary aim of this report is to provide an evidence-based framework for engaging stakeholders effectively in green transition initiatives. By synthesizing insights from diverse sources, the report not only highlights the importance of stakeholder engagement but also outlines practical pathways for achieving it.

In addition to the stakeholder strategy, the report provides an overview of the current energy demands and trends in the transport sector and port users. It examines the ongoing shift toward renewable energy sources and port electrification, identifying key challenges such as infrastructural limitations, regulatory hurdles, and the need for scalable energy solutions. By bridging these knowledge gaps, the report serves as a critical resource for stakeholders and decision-makers committed to advancing sustainable port and logistics systems.

This report is grounded in a multi-faceted approach that draws from industry reports, expert analyses, and scientific studies. Valuable insights were gathered during the project partners' workshop held in Brest, France, which facilitated a robust exchange of knowledge and expertise among key stakeholders. Contributions from the Port of Brest and the municipality of Kristinehamn further enriched this report, providing specific examples and actionable insights drawn from their respective contexts.

The report is organized to first contextualize the energy and logistical trends influencing port and transport systems today, followed by an analysis of the challenges and opportunities associated with transitioning to green energy and electrification. The stakeholder involvement strategy is then presented, detailing key steps, and pathways. Finally, the cases of Port of Brest and Kristinehamn are presented followed by a conclusion and next steps.

2. Background

Reducing greenhouse gas (GHG) emissions has become an important societal responsibility. The transport sector is one of the largest contributors to GHG emissions, accounting for approximately 21% of global CO2 emissions, according to estimates by the International Energy Agency (IEA). Ports, as mini energy systems similar to other industrial hubs, are under increasing pressure from customers and regulators to lower their

Scope 1, 2, and 3 emissions, as illustrated in Figure 1 below. Notably, around 40% of the goods passing through ports are energy-related. Ports are closely linked to economic activities, with industrial clusters often situated in and around them, highlighting opportunities for synergies and co-creation. They serve as key nodes for sector coupling and energy system integration, hosting and serving multiple industries such as oil and gas facilities, maritime supply chains, road and rail transport, cruise tourism, manufacturing sites, power stations, and operators of electricity grids and offshore wind installations (Bach et al., 2022).

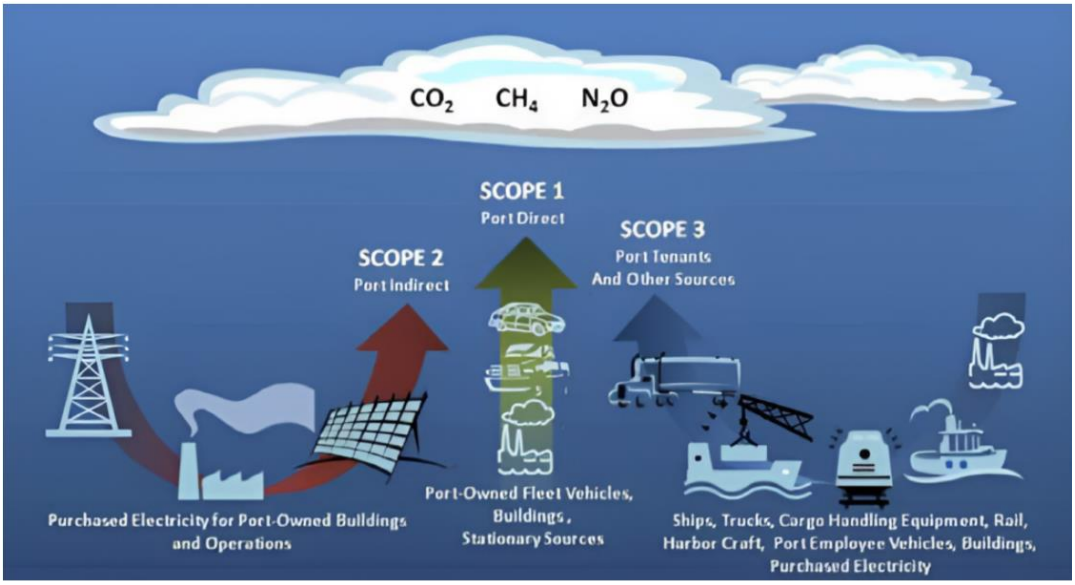

Figure 1: Port-related greenhouse gas emission sources including Scope 1, 2, and 3 (source: IMO, 2018)

The motivation for port authorities to take a more proactive role in sustainability initiatives can arise from several factors: their mission-driven ambitions, their role within the local community, their ownership and governance structure, and the need to future-proof their operations while creating new opportunities. This proactive approach is influenced by customer expectations, regulatory obligations, and European initiatives focused on achieving carbon neutrality and expanding renewable energy. It also aims to minimize the environmental impact of transport and promote biodiversity enhancement.

There are multiple stakeholders which impact and are influenced by ports decisions. Stakeholder ecosystem surrounding a port authority within the wider port area is depicted in Figure 2. It categorizes stakeholders into three groups: **Commercial** (e.g., tenants, carriers), **Institutional** (e.g., governmental bodies, NGOs), and **Community** (e.g., employees, local residents). Each group has distinct interests, ranging from economic development and regulatory compliance to societal and environmental impacts. The port authority is central, coordinating and balancing these interests (DHV, 2022).

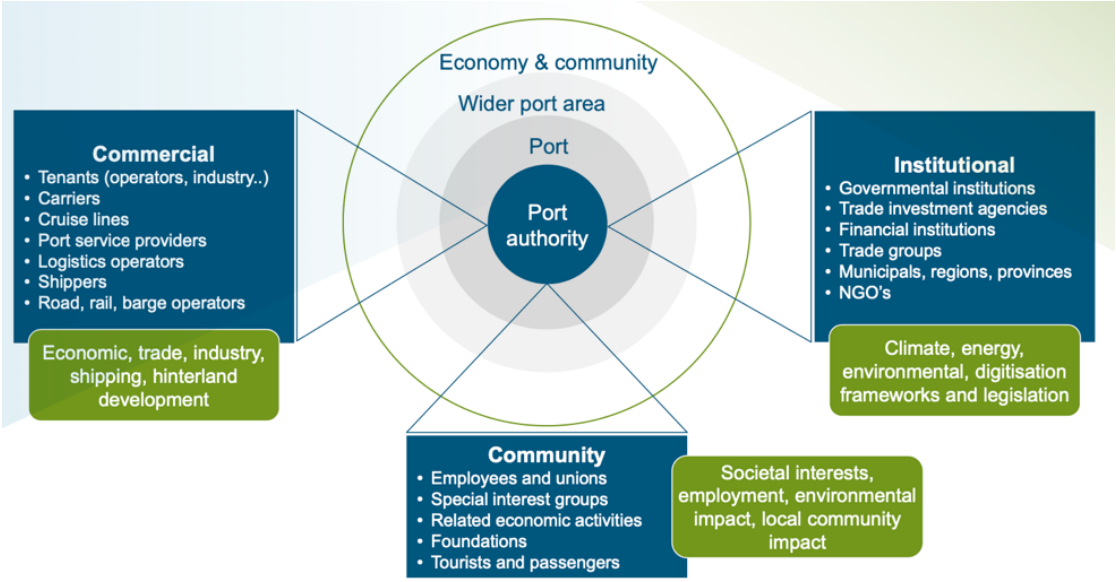

Figure 2: Stakeholder ecosystem and interests surrounding port authorities (source: DHV, 2022)

Ports can play a crucial role in satisfying the needs of these diverse stakeholders regarding decarbonization, energy efficiency, and energy transition in several ways. As landlords and investors, they can optimize spatial planning to ensure the availability of land and essential infrastructure for energy projects. They can also proactively invest or co-invest in sustainable alternative energy solutions to meet their own energy needs and support the energy requirements of their customers, nearby industrial clusters, and the broader community. In their role as "regulators," port authorities can develop and apply tariffs and incentives to encourage low-carbon initiatives and enhance environmental and safety standards to facilitate the production, storage, bunkering, and transportation of alternative fuels. Additionally, as "enablers/collaboration partners," ports can initiate collaborations, partnerships, and business consortia with various stakeholders in the transport and energy ecosystem. This can help align climate goals, predict energy needs, and develop projects related to the production, storage, and transportation of low/zero carbon fuels (Lind et al., 2023).

One promising measure for ports is to improve energy efficiency and ensure their own energy needs are met sustainably, transitioning from fossil fuels to sustainable energy solutions. Electrification is central to this transition, providing power for various equipment, including cranes, reach stackers, prime movers, tugboats, forklifts, and the vehicles used within the port. Many ports are also investing in LED and smart lighting systems for their premises and acquiring green electricity from energy companies. Some ports have even invested in producing their own renewable energy through solar and wind power installations. Evidence from Swedish ports shows that such measures can lead to significant operational cost savings (OPEX) and provide additional benefits, including reduced emissions and noise pollution, contributing to the UN's Sustainable Development Goals (Bach et al., 2022;).

Recently, an increasing number of operators of vessels, railways, and heavy vehicles have set ambitious CO2 reduction targets and must comply with various regional and global environmental regulations. These carriers are working to optimize their operations and reduce their reliance on fossil fuels by switching to low or zero-carbon energy sources, such as electricity generated from renewable sources. Consequently, ports are expected to facilitate and support sustainable energy consumption by these carriers. Port authorities can help by providing infrastructure for bunkering low-carbon fuels (e.g., ammonia, hydrogen, and methanol), offering shore-side electricity to vessels while berthed, and installing charging stations and alternative fuel stations (e.g., liquefied biogas and hydrogen) for heavy vehicles. They can also promote the electrification of rail systems within the port area.

In the broader port area, which includes linkages to offshore activities, industrial clusters, and residential areas, port authorities can act as facilitators, developers, and integrators. They can provide land and support the reallocation of industries, ensure energy supply by integrating power cables or pipelines, stimulate collaboration and stakeholder engagement, and establish projects, building alliances, offering guidance, setting regulations, and co-investing in initiatives. By taking these proactive steps, port authorities can significantly contribute to, and stimulate, sustainable initiatives (DHV, 2022).

2.1. Increasing energy demand and the shift to renewable sources

Research by Bach et al. (2022) indicates that energy demand in our region, our country, and globally, will continue to rise. Concurrently, there is a pressing need to phase out fossil energy, often through the electrification of transport and industrial processes. In Sweden, for instance, energy-intensive industries are transitioning from fossil fuels like coal and heating oil to electricity and hydrogen.

The global need for renewable electricity is expected to increase significantly in the coming decades. The share of wind and solar power in the energy mix has been steadily rising in Sweden, Europe, and worldwide, while the cost per kWh of produced renewable energy is rapidly **decreasing**. Currently, wind power accounts for 12 to 15 percent of Sweden's electricity consumption. Germany and Spain lead Europe in wind power capacity, while China dominates globally with over a third of the world's installed capacity. **Denmark generates more than 40 percent of its electricity from wind power**. Long-term projections suggest that by 2040, wind power will contribute 47 percent to Sweden's electricity production (Gävle hamn, 2020).

Industrial companies have established ambitious sustainability plans, often encompassing high targets. Many of these companies manage large transport volumes and actively design their logistics flows, integrating these into their own systems. Increasingly, their sustainability reports include external logistics (Scope 3), and initiatives are underway **to coordinate goods flows from multiple owners to create larger, more efficient logistics systems for exports**.

2.2. Advancements in road transport

In road transport, haulage companies are focused on load, route, and vehicle optimization, along with economical driving practices (ecodriving). Energy efficiency is a critical component of their operations. These companies are also exploring new fuels and vehicle propulsion technologies. Alternatives include renewable fuels like HVO, RME, and ED95, which can be used with existing diesel engines, as well as new vehicles designed for dual-fuel and gas (LNG/LBG) propulsion. The food industry exerts significant pressure to avoid biofuels that compete with food crops, leading many operators to switch to biogas (LBG) for transport.

Electrified heavy vehicles are being developed with two main propulsion methods for electric motors: **battery** operation and **hydrogen fuel cells. Electrifying transport with hydrogen requires advancements in vehicle technology (trucks, ships), infrastructure, and the regulatory framework surrounding hydrogen production,** conversion, storage, and distribution. Battery-powered electrification has made progress but still needs substantial development in charging infrastructure. For the foreseeable future, the external environment will require infrastructure that supports multiple energy and logistics systems. Fossil fuels and biofuels share a common infrastructure for production, transformation, storage, and distribution. However, systems based on electricity—whether batteries or hydrogen—require a new type of infrastructure. As these developments continue, ports and transport operators must adapt to support diverse energy and logistics systems, ensuring sustainable and efficient operations for the future. Figure 3 below highlights media coverage reflecting these transformative changes in the transport sector.

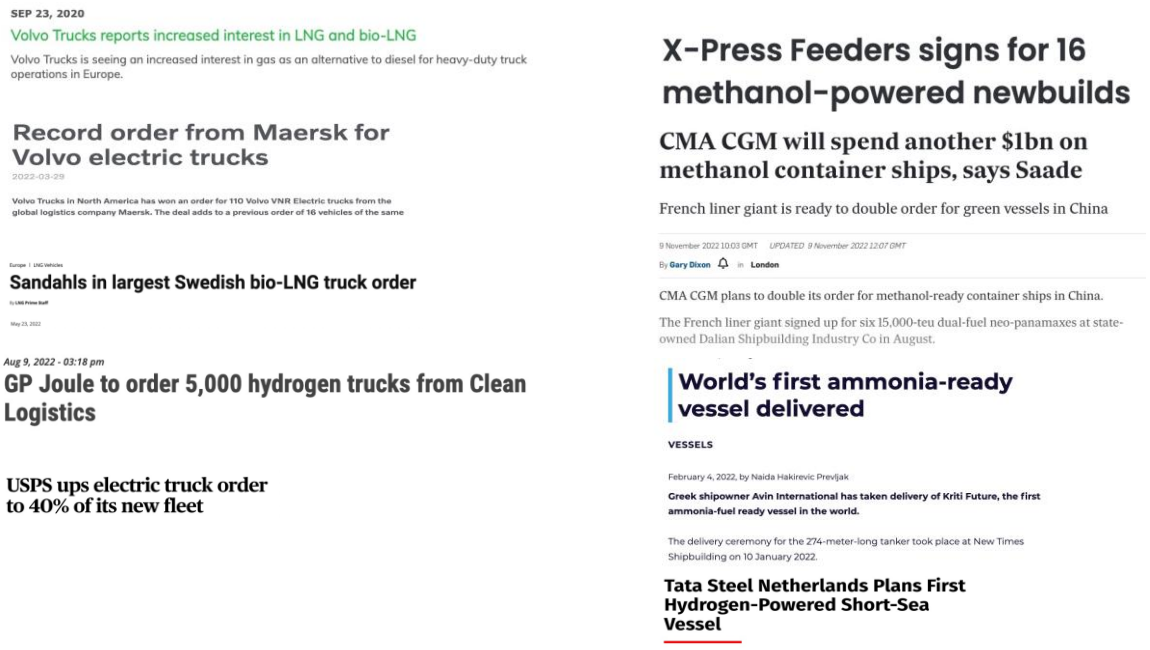

Figure 3: Media headlines about energy transition of transport sector

2.3. Electrification strategy for ports

To meet the requirements of port customers, ports can focus on an electrification strategy. Electrification is **generally more feasible for ports** or terminals (both maritime and inland) where the space is compact, and equipment is used for short durations and over short distances.

Inland ports often play a different role in energy supply chains than seaports. For example, inland ports can more easily adopt technologies for transport electrification and onshore power supply due to the smaller ship sizes and shorter inland journeys, which are better suited for testing, implementation, and adaptation. However, inland ports tend to be smaller and more decentralized, facing challenges in finding the right scale for bundling initiatives to make the required changes economically attractive and effective.

In the energy transition, seaports and inland ports will play complementary roles in connecting and strengthening future energy supply chains. Cooperation and interaction between inland and seaports will be essential to facilitate the procurement and supply of renewable energy in both directions. This is a crucial step towards developing environmentally friendly hinterland and inland connections that sustainably serve industry, manufacturing, and consumer markets.

Replacing or retrofitting diesel-powered port equipment with electric drives presents a cost-effective and energy-efficient solution for lowering emissions in port and cargo handling operations. This transition applies to various diesel-powered assets, including vehicles, vessel fleets such as tugboats, barges, and support vessels, as well as land-side equipment like terminal tractors, forklifts, rubber-tired gantry cranes (RTGs), and mobile harbor cranes (MHC). However, the extent of efficiency gains from electrification depends on multiple factors, including the operational profile, investment costs, and electricity prices, all of which influence overall cost-effectiveness. Additionally, not all equipment providers offer clear road maps, making market analysis essential to navigate the uncertainties surrounding implementation strategies.

Most types of mobile terminal equipment operate with internal electrical drives powered by onboard diesel generators. This equipment is very suitable for electrification, with drives powered by the onboard electrical grid. Fully-electric equipment is considered zero-emission at the point of use, provided the electricity is sourced from renewable energy. Equipment that cannot be fully electrified can still reduce emissions with hybrid diesel-electric units. Although not a zero-emission solution, hybrid drive systems can significantly lower emissions compared to purely diesel-powered equipment.

The use of alternative energy carriers, such as ammonia or methanol, may be a solution but currently lacks technological maturity for port and terminal equipment applications. Dual-fuel engines for trucks and tugs (operating on diesel and LNG) are among the existing examples. In the future, low-to-zero carbon fuels such as hydrogen (combined with a fuel cell or engine) could be deployed on a larger scale for heavy-duty equipment and equipment with longer operational periods, complementing battery power.

In summary, ports can drive sustainability by adopting electrification strategies, collaborating with inland ports, and exploring alternative energy carriers, thereby reducing emissions and contributing to a greener future.

2.4. Challenges in the energy transition for ports

Previous research (Bach et al., 2022; DHV 2022; Raza et al, 2020; Santén et al,. 2021) highlights several significant challenges affecting ports and shipping companies' ability to transition to sustainable energy sources and shifting traffic from road to sea. The primary obstacles include insufficient financial resources, high costs and taxes, immature technology, lack of infrastructure, standardization issues, competence shortages, and political ambiguity.

A critical factor for implementing measures to reduce carbon dioxide emissions is the creation of economically sustainable projects. Ports often face limited funds, requiring a careful balance and prioritization of investments, whether by port authorities, terminal operators, or other stakeholders. Energy infrastructure projects, such as providing shore power from renewable electricity, require substantial investments and a long-term perspective on returns. For instance, costs for such projects can range from 1 to 25 million euros, covering grid connection, cables, converter stations, and onshore power installations, depending on the specifics of the port. Additionally, shipowners may need to invest around 0.5 to 1 million euros to make their vessels compatible, necessitating a cost-benefit analysis between electrification and alternative fuels.

Technical challenges also pose significant barriers to port electrification. For example, the need to charge electrified equipment can limit their availability across all operational shifts, requiring supplementary diesel-powered support. Mobile cranes, which need to be relocated around port quays, may not easily connect to a fixed electrical supply. Furthermore, electrifying the final stretch of rail within port areas can be problematic due to potential interference with other transport modes caused by overhead lines. Additional issues include immature technology, limited grid capacity, and uncertainty about the future fuel choices for port visitors.

Standardization and specialized competence are also crucial considerations. New technologies often lack established standards, complicating the development of green infrastructure investments. The absence of standardized shore power connections, for example, can hinder profitability and investment in such systems. While providing shore power to ferries with consistent routes between two ports is relatively straightforward, bulk ports with irregular ship arrivals depend on standardized solutions for both ships and ports.

Moreover, the production and storage of alternative energy carriers can require significant space, often more than traditional fuels. For example, storing LNG, ammonia, or hydrogen gas can take two to four times the space compared to diesel. This becomes particularly challenging in ports where land is already heavily utilized and leased.

Finally, political ambiguity, lengthy permit processes, and regulatory barriers can further impede the transition to a sustainable transport system. These factors add layers of complexity and uncertainty, making it difficult for ports to implement necessary changes and invest in long-term sustainable solutions.

3. Stakeholder engagement plan

Energy transition and the decarbonization of transport require active engagement and coordinated actions from all stakeholders, including shippers, transport operators, freight forwarders, ports, vehicle manufacturers, engine producers, energy providers, and policymakers. Stakeholder engagement is a complex and multifaceted process involving various activities, such as collecting and disseminating information, addressing stakeholder concerns and grievances, assessing the impact and importance of different stakeholder groups, and facilitating communication through various channels.

The stakeholder engagement plan has been developed based on insights from various expert reports and publications, including guidelines from the World Bank Group, McKinsey & Co., and the Doughty Center for Corporate Responsibility at Cranfield University (IFC, 2007; Jeffery, 2009; Rogersson et al., 2020; Tomlinson & Parker, 2021).

The stakeholder engagement process involves several key steps as illustrated below in Figure 4. However, it is important to note that the steps involved in a stakeholder engagement plan should not be viewed as a strictly linear or sequential process. Instead, they represent an iterative approach, where ports may need to continuously revisit and refine their strategies based on evolving conditions, feedback, and stakeholder needs. Ports may need to cycle back to earlier phases, such as reassessing stakeholder priorities or revising communication strategies, in response to new information or changes in project scope. This flexibility is essential to ensuring effective engagement. Additionally, the stakeholder engagement steps detailed below serve as a general guideline, and should be tailored to the specific context, project type, and unique characteristics of a port. By adapting the process to fit the particular circumstances, ports can ensure that their stakeholder engagement efforts remain relevant, effective, and responsive.

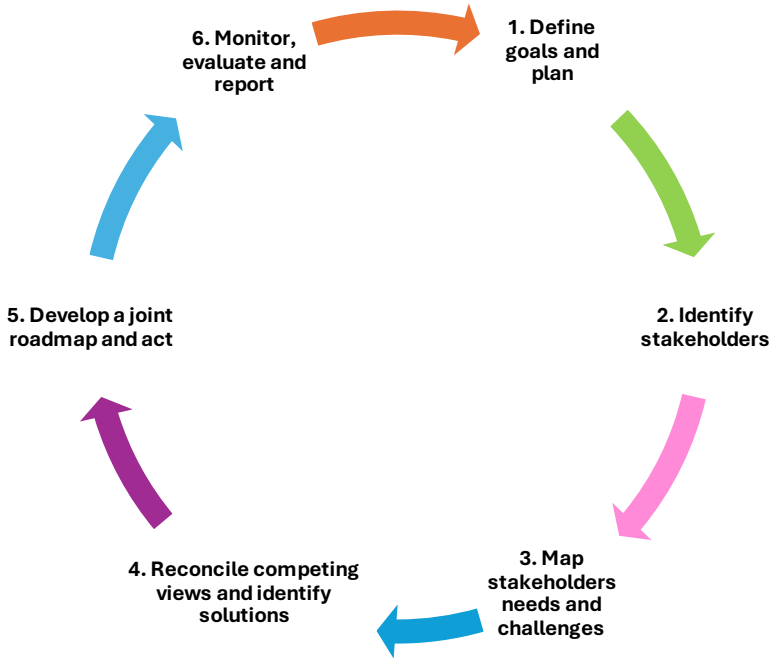

Figure 4: An iterative stakeholder engagement framework

3.1. Goal setting and planning phase

The planning phase marks the first step in the stakeholder involvement strategy. During this phase, it is essential for ports to define the key goals or objectives they aim to achieve through stakeholder engagement. The goals should be achievable, incremental, and have clear boundaries. It is important to adopt a step-by-step approach with an experimental mindset and prioritize objectives that require low investments but yield high returns. In setting these objectives, ports should consider customer expectations, societal impacts, and regulatory requirements at the regional, national, and international levels. These factors should be integrated into the goal-setting process. The objectives should follow the SMART framework: specific, measurable, achievable, relevant, and time-bound. For example:

- Reduce CO2 emissions by XX% by 2030 compared to 2024 levels.
- Increase energy efficiency by XX% by 2030 (e.g., reduce energy consumption by X kWh per ton of goods handled).

Clearly defined goals enable the identification of practical actions and solutions that will support the achievement of these objectives. Ports and their stakeholders strive to assess the necessary adjustments to current business operations and processes that will result in measurable improvements in CO_2 reductions and energy efficiency. The specific role of each stakeholder will depend on the project or action required to meet these goals (Jeffery, 2009).

An effective example of stakeholder engagement is demonstrated by the implementation of onshore power supply (OPS) for fishing vessels at the Port of Skagen in Denmark. In this case, fishing vessel owners were the primary stakeholders, with the main challenge being to establish a suitable price point for electricity that offers clear value for the vessels while simultaneously reducing noise and CO_2 emissions in the port area. As Denmark's largest fishing port, Skagen Havn has taken proactive steps to encourage OPS adoption, overcoming the "chicken-and-egg" dilemma and motivating vessels to switch to cleaner shore power. By offering shore power at competitive rates, Skagen Havn attracts vessels to the port and achieves substantial CO_2 savings. To support this initiative, Skagen Havn has invested in a new mobile power system with a capacity for 10 outlets, each positioned 100 meters apart along the quay. This project is funded in part by the EU through the Interreg North Sea Region Programme project 'REDII Ports,' underscoring the commitment to sustainable port practices.

Key considerations and questions for the planning stage (adapted from Jeffery, 2009 and IFC, 2007):

- What are our specific objectives for this engagement?
- What are the primary issues we need to address?
- Has our organization previously engaged on these issues, and what lessons can we learn from that experience?
- What resources (time, budget, personnel) can we dedicate to this initiative?
- How much internal support, including from senior management, exists for this engagement?
- What is our target timeline for achieving the desired outcomes?
- Who are the most appropriate representatives to consult with?
- What consultation methods and formats will be most effective for reaching our stakeholders?
- What is the expected timeframe for conducting consultations and discussions?
- Are there any legal requirements, either national or international, that we need to consider, and how might they impact our engagement?
- What potential challenges or obstacles might we face, and have we identified them?

3.2. Identifying stakeholders

In the next phase, ports should identify their stakeholders. Before engaging with stakeholders, it is essential to identify who they are. Create a comprehensive list of all potential stakeholders, including both internal and external groups. This list might encompass port employees, port owners and management, municipal authorities, customers (such as cargo owners, freight forwarders, shipping, rail, and trucking companies), suppliers (including electricity companies), investors, regulators, and community members.

The concept of stakeholders and stakeholder engagement has become increasingly prevalent in international business, particularly concerning social and environmental performance. In literature (Jeffery 2009), stakeholders are commonly defined as:

- *Individuals or groups who affect or are affected by your organization.*
- *Those who have a stake, claim, or interest in the organization's operations and decisions, whether through legal, financial, or moral claims, or explicit or implicit contracts.*
- *Providers of critical resources necessary for the success of the enterprise, such as licenses to operate, financing, or skilled labor.*
- *Entities with sufficient power to influence the organization's performance, either positively or negatively, such as through mobilizing social forces or withdrawing labor.*

Figure 5 illustrates a diverse range of stakeholders and perspectives that must be considered for instance for a port's energy strategy.

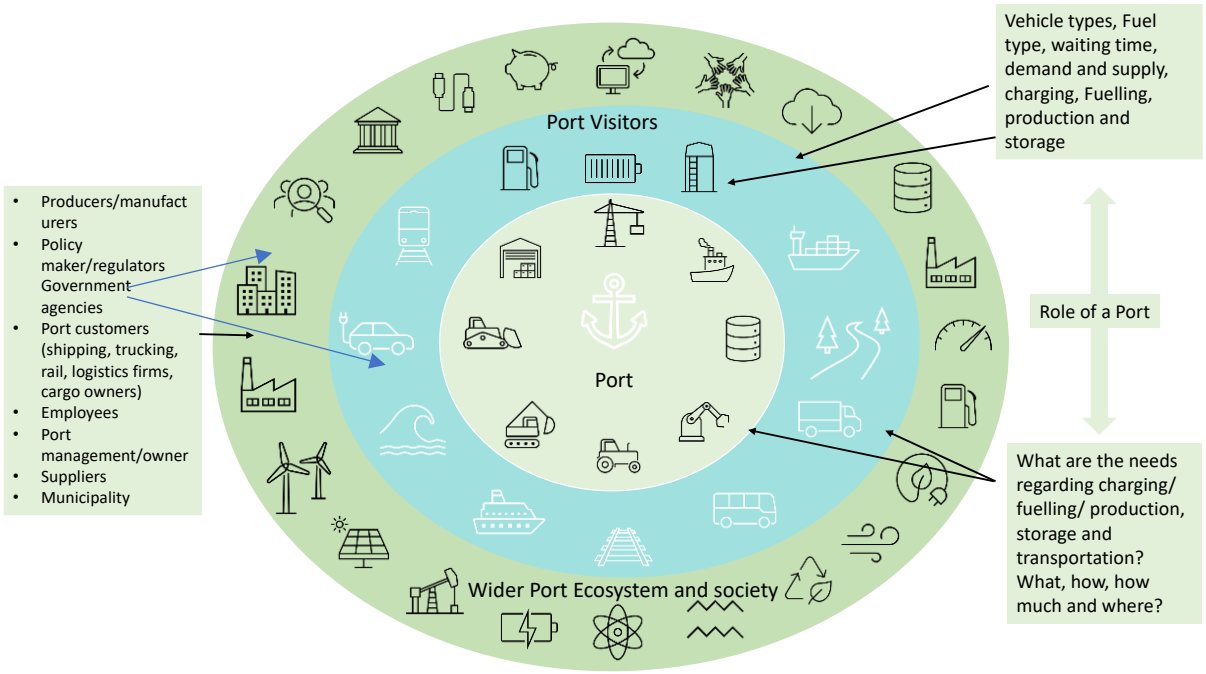

Figure 5: Port stakeholders and role of a port in energy transition (source: RISE)

Key questions for mapping stakeholders (adapted from Jeffery, 2009 and IFC, 2007):

- Who will be impacted by your project? (Ensure to consider a diverse range of stakeholders.)
- What are their specific interests or concerns related to the project?
- What decisions are they responsible for?
- Who are the key stakeholders with the most influence or importance?
- Who are the critical individuals to engage within each stakeholder group?
- How can you organize and systematize your outreach? (Set a detailed calendar of actions and engagements.)
- How can you engage with different levels within the organizations (staff, board members, etc.)?
- What communication methods will be most effective (e.g., surveys, workshops, one-on-one calls)?

When identifying stakeholders, it is crucial to determine which broad stakeholder categories you intend to engage with. The focus on specific stakeholder groups will depend on your collaboration needs and capacity. It is important to recognize that while mutual agreements can be made with stakeholders, each individual brings unique experiences and cannot fully represent all views within their stakeholder group.

Different methods can be employed to identify stakeholders, such as:

- **Snowballing Approach:** Start with a list of known stakeholders and ask them to suggest additional stakeholders, who in turn suggest more, creating a growing network of relevant parties.
- **Open Call Approach:** Use public forums, such as social media, to announce planned projects and invite interested stakeholders to participate.

Once you have identified relevant organizations and individuals, select the most appropriate representatives to work with. Consider factors such as the stakeholder's expertise or experience, investments, technical knowledge, and regulatory or policy expertise to form an effective stakeholder team (IFC, 2007). This thoughtful selection process helps ensure a productive and comprehensive engagement strategy. Additionally, given the potentially large number of stakeholders, it is essential to focus on a smaller group with both high interest and significant influence who together can set goals and scale up if needed.

Ports can engage with stakeholders through industry organizations or collaborative platforms. An example of this is the Smart Delta Resources in the Netherlands and Belgium. Smart Delta Resources is a transnational partnership that brings together major industries from the chemical, steel, energy, and food sectors, along with ports and governments across the two countries. SDR aims to lead the way in the industrial energy transition, representing a united effort among the region, participating companies, and international governments.

Using tools like a stakeholder analysis matrix and prioritization grids, port authorities can systematically assess and weigh the various viewpoints of different stakeholders. The Stakeholder Analysis-Prioritization Matrix as illustrated in Figure 6 is a strategic tool used by the organizations to identify and prioritize stakeholders based on their level of interest and influence. This helps businesses allocate resources effectively and manage stakeholder relationships to ensure project success. At a very high level, the Stakeholder Analysis-Prioritization Matrix is used in the context of business, management, and strategy.

Figure 6: Stakeholder prioritization matrix (Source: adapted from Wallbridge, 2023)

Moreover, the following template (see Table 1) can be used by ports to identify the stakeholders for a project, including their level of influence, which issues are important to them, and how they will be engaged. The template below is just an example and can be adjusted based on the specific context and needs.

Table 1: Stakeholder analysis tool (Source: adapted from Tools4dev)

Stakeholder group and contact information	Impact of a project on stakeholder(High, medium, low)	What issues/interests are important?	Level of support (Opposed, Neutral/ undecided,Supportive)	Reasons for resistance or support	Strategy to engage stakeholder
Primary stakeholders					
Secondary stakeholders					

Involving external stakeholders such as consultants, policy makers and entrepreneurs can help in bringing valuable perspectives that can drive the development and implementation of new ideas and strategies. Their involvement fosters innovation, often leading to creative solutions essential for keeping companies competitive in a rapidly evolving market. By engaging entrepreneurs in the stakeholder involvement strategy, organizations can cultivate a culture of change and adaptability, leveraging their forward-thinking mindset to identify emerging trends, explore new opportunities, and address challenges proactively. Including entrepreneurs in this strategy not only strengthens the organization's capacity for innovation but also aligns long-term goals with dynamic, market-responsive approaches. During project meeting in Brest, our project partner Waalvijk indicated that they received funding from the province to conduct an investigation, during which they engaged consultants to help create a roadmap. Expertise was brought in from external sources, including the steering group and entrepreneurs, allowing them to acquire specialized knowledge. This collaboration has been successful, as all stakeholders are actively working together on the plan, known as

Green Deal 2.0. This serves as a strong example of effective stakeholder engagement, combining internal commitment with external insights to drive forward shared goals.

3.3. Mapping stakeholders' requirements, needs, and challenges

Creating meaningful change requires actively listening to stakeholders. Workshops, focus groups, and one-on-one meetings can be used to gather input and understand stakeholder needs and challenges. At this stage, it is important to be receptive to all ideas without being constrained by feasibility concerns, these considerations will come later. Listening should be an ongoing process, as stakeholder needs and priorities may evolve over time. Although understanding stakeholder needs and desires doesn't require a company to address all of them, selecting which to focus on offers multiple options for action (Mckinsey & Company, 2021). Addressing critical factors, such as return on investment, stakeholder-added value, and access to financing is essential for the success of any project and for ensuring effective stakeholder engagement.

Internally, this phase involves gathering insights from employees, executives, and board members to understand their experiences, expectations, and concerns. Externally, it means identifying the urgency, legitimacy, and influence of stakeholder issues. It should also recognize the alignment between your organization's objectives and the stakeholders' motivations and needs. This understanding will help prioritize stakeholders based on the urgency of their issues, the legitimacy of their interests, and the power they have to impact your organization.

Once you've identified the stakeholders to engage and the most appropriate methods for doing so, considering the context, local realities, and stakeholder characteristics, you should identify and track issues of interest or concern for each group. Utilizing a knowledge management system can be helpful in monitoring these topics and documenting issues that are being addressed, resolved, or escalated within the business.

Each stakeholder has unique needs and expectations, so it is essential to engage with them to understand their perspectives. Ask questions, seek their input, and listen carefully to learn what they hope to gain from the project. Tailor your communication and engagement strategies to align with these insights.

According to McKinsey & Company (2021), aligning ideas with a company's strengths and purpose is crucial, especially if they can provide a competitive advantage. To prioritize actions, use three criteria: how well an idea aligns with the company's strengths, its relevance to specific stakeholder needs, and its potential for long-term value creation. Once evaluated, ideas should be ranked relative to each other. Since not all ideas can be directly monetized, comparisons may be challenging. One approach is to have stakeholders rank the ideas against others, or to examine what similar organizations are doing.

Gather sufficient information to make informed decisions and then proceed with action. It's unrealistic for any organization to pursue every idea, so prioritizing helps manage trade-offs. Finally, make commitments with clear timelines, which helps build credibility and provides specific goals to achieve.

Initial generic questions potential issues of interest to stakeholder (adapted from Jefferey, 2009):

- Can you provide an overview of your organization?
- What are your expectations or concerns, both positive and negative, regarding port operations?
- What actions or changes do you believe should occur to address this issue?
- In your view, what are the underlying causes of this issue, whether positive or negative?
- What other factors influence this issue, and how do they impact it?
- Do you consider this issue a priority for your organization? Why? What other themes are affected by this issue?
- How do you think the port or related organizations could effectively address this issue?
- What role could you or other stakeholders play in resolving this issue?
- Are there any other third parties who should be involved in addressing this issue?

3.4. Reconciling competing stakeholder views and identifying potential solutions

Reconciling competing views involves navigating the diverse perspectives and expectations of various stakeholders involved in port operations. Given the wide range of interests—ranging from environmental concerns to economic priorities—it is crucial for port authorities to facilitate open and transparent communication(Bahadorestani et al. 2020).

The objective is to identify common ground and areas of divergence, and then facilitate discussions that focus on finding mutually acceptable solutions. Additionally, mediation or facilitated negotiation can be employed to manage conflicts and align differing interests. By engaging stakeholders in meaningful discussions and involving them in the decision-making process, ports can work towards solutions that, while not satisfying everyone completely, are broadly acceptable and sustainable. This methodical approach not only aids in reaching balanced and informed decisions but also builds trust and demonstrates a commitment to considering all voices in achieving long-term objectives (Jeffery, 2009).

As part of the stakeholder management plan, identifying potential solutions for emission reduction is a critical step. This involves engaging with stakeholders to explore, evaluate, and implement strategies that align with environmental goals, regulatory requirements, and the operational realities of the port. The process starts with understanding the specific sources of emissions within the port operations—ranging from port-owned vehicles and equipment to third-party activities such as shipping, trucking, and rail operations.

O Electrification is a key strategy for reducing emissions, involving the replacement of diesel-powered equipment with electric alternatives and the use of shore power systems for docked vessels. Renewable

energy integration, such as wind and solar power, further supports sustainability by powering operations and reducing the port's carbon footprint. For detailed solutions, refer to Chapter 2: Background.

Furthermore, ports should explore the use of alternative fuels like hydrogen, ammonia, and biofuels for heavy-duty equipment and transport vehicles. While these technologies are still developing, they offer promising pathways to further reduce emissions, especially when electrification is not feasible. Stakeholders need to be engaged in assessing the feasibility, costs, and benefits of these options, ensuring that the port's transition to low-carbon operations is both practical and effective. By identifying and implementing a combination of these solutions, ports can significantly contribute to global emission reduction efforts while maintaining operational efficiency and competitiveness (DHV, 2022).

3.5. A joint roadmap and roles and responsibilities

The process for developing a joint roadmap, defining sufficiently strong change targets and following up the roadmap should be organized in a regular, inclusive and transparent way. Great responsibility remains on each individual business to contribute to further developing common goals, setting and revising change targets, and implementing both own and common roadmaps. With the aim of creating a shared clarity of the way forward, it is proposed to continuously have a documented common roadmap that is accessible to everyone within a port cluster, and that is not too detailed. Ports can identify and indicate the key deliverables in the roadmap which should be distributed in time and grouped by process (port operations, sea transport, road transport, rail transport, logistics hub, energy hub). The purpose of this is that each individual cluster actor should be able to easily connect their organization and their own initiatives and deliverables to the Joint Roadmap (year XX), i.e. see themselves in the context. The aim is also for the focus to be placed on concrete commitments instead of plans and ideas.

During the dialogues, various cluster actors are encouraged or invited to develop project plans and investment plans themselves that align with the Common Objectives, Common target levels, and Common Roadmap.

Information must be available to other cluster actors where relevant. Deliverables of common interest and value should be included in the joint Roadmap and presented openly. It should not be the port that sees the whole and aggregated the plans and then coordinates everyone's efforts. The responsibility should lie with each cluster actor to synchronize their own plans to a common objective, overall goal, and common roadmap. Each individual business must be able to see itself in a common target goal and roadmap, and see how their efforts contribute to CO_2 reduction and energy efficiency on the whole. It is therefore important that cluster actors also see each other.

Ports need to ensure that all stakeholders see the same thing, strive in the same direction, create the right conditions and take actions. The challenge is not to create a willingness to change and maturity in the matter related to decarbonization and energy transition. Rather, it is how ports can make it happen fast enough, both for the climate and for the competitiveness. There is no one individual who can contribute to the identified

goals all by himself. There is no individual who can bear the entire responsibility for achieving the sustainability targets. Ports need a working model that promotes action capacity, both as an individual business and as a port cluster as a whole. A working model that also verifies that the level of ambition is high enough to meet the requirement for CO_2 reduction and energy efficiency.

Ports, for example, can take on the role of coordinator of a joint goal and joint roadmap. Coordinating means always keeping documents up-to-date and available for all port cluster actors but also for external stakeholders, to continuously follow up the outcome of the work towards the common goals, and to have a continuous dialogue with the cluster actors regarding the target goal and roadmap.

Table 2. Illustration of a joint roadmap (source: adapted from Gävle hamn, 20220)

Desired targets and measure per period	**2324-2026** **Establishment of energy infrastructure**	**2026-2028** **xxx**	**2028-2030** **xxx**	
Goal 2030: **-Reduce CO_2 by XX% by 2030 compared to year 2024.** **-Improve energy efficiency by XX% by 2030 (reduce energy consumption by X kWh per kg/ton of goods handled**	-XX% reduction -XX% reduction	-XX% reduction -XX% reduction	-XX% reduction -XX% reduction	
Ports				
Shipping				
Road transport				
Rail operators				
Logistics/warehousing companies				

ILLUSTRATION

3.6. Reporting back to stakeholders

Monitoring and evaluating stakeholder engagement is an ongoing process. Winning support or resolving an issue initially does not guarantee it will remain resolved, as both internal and external environments are complex and may shift over time, influencing priorities and stakeholder concerns.

Documenting, reporting, and maintaining clear records are vital elements of the stakeholder engagement process, especially when reporting to third parties, external bodies, or the media. Providing feedback to stakeholders is crucial for organizational learning, as it allows you to gauge stakeholder reactions to your actions and behaviour.

The quality, efficiency, and perceived fairness of your documentation, reporting, and feedback system can significantly impact the perceived transparency of your overall engagement process. Effective reporting builds trust and demonstrates a commitment to openness and accountability.

Below are suggestions for providing appropriate feedback and reporting to stakeholders:

- **Regular Updates:** Provide consistent and timely updates on project progress, milestones, and any changes.
- **Varied Communication Channels:** Use multiple channels such as emails, newsletters, social media, and face-to-face meetings to reach all stakeholders effectively.
- **Transparent Reporting:** Clearly document all engagement activities and outcomes and make this information accessible to stakeholders.
- **Feedback Mechanisms:** Implement systems for stakeholders to provide feedback and ensure their concerns are addressed promptly.
- **Impact Measurement:** Accurately measure the impact and success of stakeholder engagement activities. This includes evaluating the relationship between resources expended (e.g., staff time, costs) and the benefits gained, such as enhanced reputation, compliance to regulations, better risk mitigation, reduced costs and increased efficiency.

By systematically reporting and providing feedback, organizations can build stronger relationships with stakeholders, improve transparency, and ensure that engagement efforts are aligned with overall strategic goals.

Effective communication is crucial for successful stakeholder engagement. Keep your stakeholders informed about project progress, milestones, and changes using a variety of communication channels, such as emails, newsletters, social media, and face-to-face meetings. This ensures you reach stakeholders where they are and keep them updated.

Organize regular meetings or workshops—bi-weekly, monthly, or quarterly, depending on the project's nature—to provide updates and offer a platform for stakeholders to share their feedback, insights, and perspectives. These meetings should be clear, concise, and transparent, addressing stakeholders' concerns and questions while leveraging their recommendations and suggestions.

When stakeholders feel their opinions and feedback are valued, they become more engaged and invested in the project. High-value and high-voice stakeholders can provide critical, value-adding feedback essential for

your efforts. Actively seeking and incorporating their feedback ensures the project aligns with stakeholders' needs and expectations and fosters their commitment to the project's success.

Reporting back to stakeholders (adapted from IFC, 2007 and Jeffery, 2009)

The following considerations may be helpful when devising the reporting component of your stakeholder engagement strategy:

- Consult with stakeholders to understand their reporting needs and requirements and agree on reasonable reporting obligations.
- Request regular feedback from stakeholders on the reports and information they receive.
- Identify what information needs to be reported to which stakeholders, determine the appropriate methods, and establish the frequency of reporting.
- Regularly update your commitments register and disclose progress to all affected and interested parties, particularly highlighting any significant changes to commitments or actions.
- Make monitoring results publicly available, including reports from external monitors.
- Provide regular updates on the stakeholder engagement process to both directly engaged stakeholders and other interested parties.
- Ensure reported information is available in other languages, including local languages, if necessary.
- Offer feedback in summary or easy-to-understand formats.
- Include a summary of stakeholder consultation activities in the Annual Report.

4. The case of Kristinehamn

Kristinehamn Municipality is located in the Värmland region in central Sweden. The municipality has just under 24,000 inhabitants, with Kristinehamn being the largest urban area, home to approximately 18,500 residents. Kristinehamn has a rich history in transportation, particularly in shipping and railways, and has long been home to numerous established trucking companies.

The municipality borders Lake Vänern, Europe's third-largest lake, for a significant stretch. In the urban area, there is a port facility operated by Vänerhamn, a company largely owned by the port municipalities around Lake Vänern, including Kristinehamn Municipality, which holds a 17.5% stake. Vänerhamn handles 2.6 million tons of cargo annually, of which approximately 1.6 million tons are shipped via waterways.

In 2023, Kristinehamn's port managed a cargo turnover of 252,547 tons, with 72% classified as waterborne cargo. Key commodities handled at the port include forestry products, sawn timber, and chemicals, reflecting

the significant presence of the forest industry in the region. A large portion of the goods transported across Lake Vänern either originates from or is destined for foreign ports. This makes the ports around Vänern vital hubs for the regional economy's trade with the global market.

Kristinehamn's port is rail-connected and is just a short distance from the Kristinehamn railway yard. The port is also situated near several trucking companies and is only a few kilometres from the E18 European highway.

The partner in the Green Supply Chains project is Kristinehamn Municipality, both in its role as a local authority and as a part-owner of Vänerhamn. However, the company Vänerhamn is not a direct partner in the project but is involved as a supporting partner of the work, and there is a close collaboration between the municipality and Vänerhamn as part of the project.

The purpose of the municipality's participation is to support and utilize the stakeholder management process developed within the project to enhance synergies between (inland) ports and regions regarding electrification strategies. Kristinehamn's primary focus is on developing solutions to reduce emissions in (inland) ports and their regional hinterlands. Moreover, the participation aims to contribute to an increased volume of goods handled within the municipality, achieved through sustainable transport chains. As part of this effort, governance models need to be developed within the project to clarify the relationship between stakeholders and institutions. This is a summary of Kristinehamn's municipalities work so far with the stakeholder involvement process.

4.1. Planning phase and goal setting

The work on stakeholder involvement began with the development of a process plan, showed in Figure 7 below.

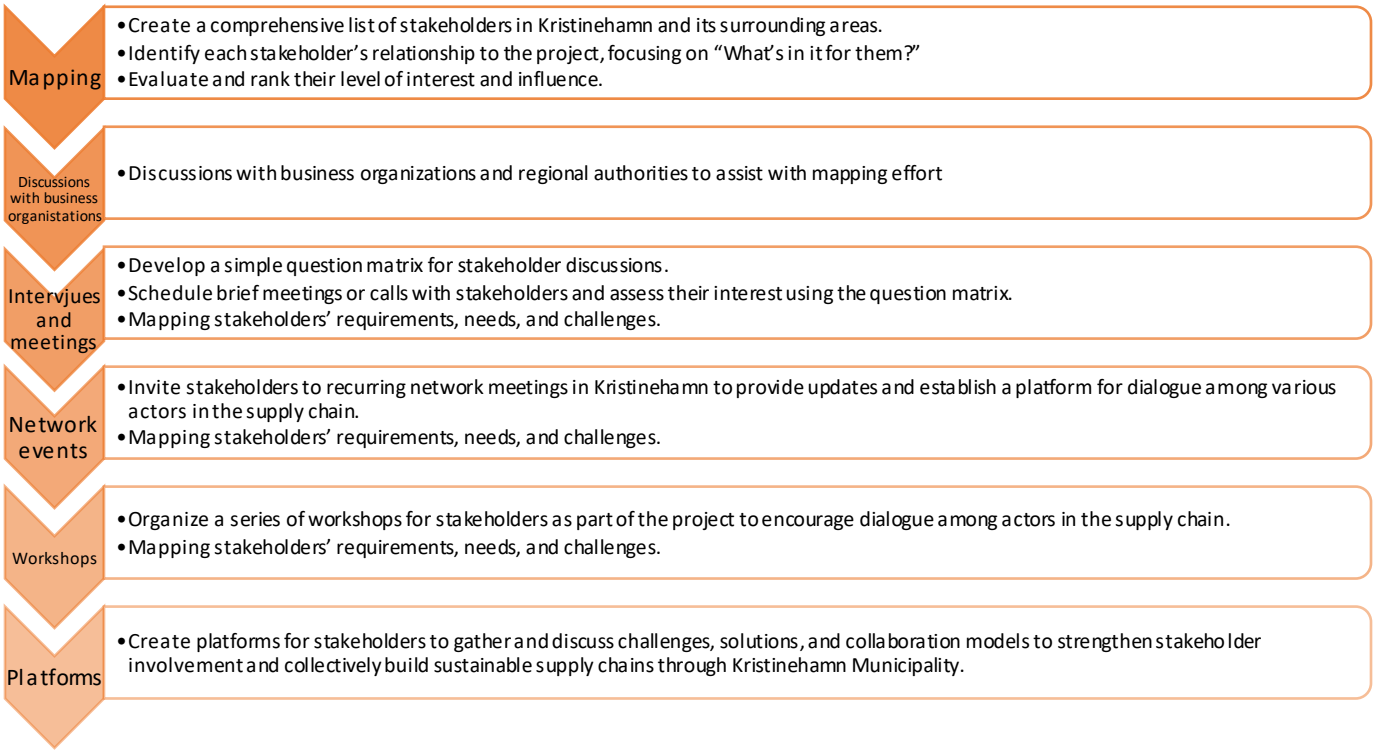

Figure 7: The process plan of stakeholder involvement developed in Kristinehamn

4.2. Mapping, identifying stakeholders and understanding their interests

At the beginning of the process mapping, a preliminary list was created with the names of all identified stakeholders in Kristinehamn and the surrounding areas. This included actors from the entire supply chain. In addition to the knowledge held by the municipal business organisation regarding local stakeholders, information was also gathered online. The list became extensive, with a particular focus on trucking companies, as this is a strong industry in the municipality.

The list was then filtered by first categorizing the stakeholders. The categories were "Cargo Owners," "Truck Operators," "Rail Operators," "Organizations/Authorities," "Shipping Companies," and "Port Operators." Afterward, each actor was reviewed more thoroughly, with further information gathered about them. Those deemed irrelevant for the project were removed from the list. This could be due to geographical location, company size, a known lack of interest, or other reasons deemed not relevant.

To identify the remaining stakeholders' relationships to the project and what they stand to gain from participating or being informed, the Swedish Association of Local Authorities and Regions (SKR) template for

stakeholder analysis where used (SKR, 2021). With the help of the template, we attempted to answer questions regarding each stakeholder's motivation, benefits, and contributions to the work. In, 8 the SKR template is shown.

Table 3: SKR's template for stakeholder analysis

Stakeholder	**The stakeholder's motivation/interest** in the improvement work *(What's in it for them)*	How can **the stakeholder best utilize/benefit** from the *improvement work?*	How can **the stakeholder best contribute** to the *improvement work?*	How can the improvement work **best benefit from this stakeholder**?

4.3. Discussions with business organisations

To better assess the progress of the mapping process and to gather insights and knowledge from experienced actors, we reached out to both Business Region Värmland (BRV), who work for development in the Värmland region of which Kristinehamn is a part, and Business Region Örebro (BRO) in the nighboring region. Both works to enhance the attractiveness and strengthen the business climate in their respective regions. Unfortunately, only BRO was able to participate in a conversation at this stage due to the fact that BRV recently started up and had a lot on the agenda. They confirmed that we were on the right track and had approached the analysis correctly. BRO also committed to sharing information about Kristinehamn's work within the GSC project with its members.

Additionally, the regions of Örebro and Värmland were contacted for suggestions on suitable stakeholders, to spread awareness of our work, and to inform them about the GSC project. Through that contact we got tips to contact an industrial association in Karlskoga, a nearby town, unfortunately that contact didn't make any difference as they weren't interested in our work due to what they described as a lack of time.

Experts in transport and logistics were also consulted to gather recommendations on relevant stakeholders, transport networks, and potential challenges that Kristinehamn Municipality could address within the project.

Unfortunately, generating interest in the project proved challenging. After multiple conversations, it became even clearer that these processes take time to achieve successful outcomes. We encountered several dead ends, primarily due to a lack of interest and limited availability from stakeholders.

4.4. Interviews and meetings

To streamline the next phase of interviews and meetings with stakeholders, a questionnaire was developed. Stakeholders were then contacted by phone or email, and meetings or calls were scheduled. This step aimed to gain an even clearer understanding of the stakeholders' mode of transports, needs, thoughts on development, and interest in participating in activities such as networking events or similar initiatives.

4.5. Networking events

Currently, platforms for bringing together different stakeholders in various industries in the supply chians are lacking in Kristinehamn and the region, which presents a significant barrier to sustainable development and effective governance. A key first step in developing these strategies is to create platforms where actors from different parts of the transport chain, along with representatives from institutions, can meet to discuss development, obstacles, and possible solutions—in essence, fostering active networking.

In this context, Kristinehamn Municipality recognizes that as a governing authority, Kristinehamn must take the first steps in establishing regional networking efforts to contribute to the development of green transport chains and support the overall goals of the GSC project.

Kristinehamn Municipality has so far organized two networking events for actors within the transport and logistics sector. The purpose of the events was to establish a platform for regional actors to share and access information regarding transport and logistics developments in Kristinehamn. Each event had its own theme and each time a stakeholder had a presentation in line with the theme. The network meetings are planned to be a recurring event with approximately two to three meetings a year. The last one where held in September this year (2024) on the theme Sustainable transports, needs and challenges. Participated were representatives from the haulage industry, the train companies, the manufacturing industry, the regional authority, RISE, the port company, and the municipality.

4.6. Workshops

Within the project, three workshops are planned, for which Kristinehamn Municipality will be responsible. The purpose of these workshops is twofold: to gather input and test a stakeholder collaboration strategy, and to identify, through discussions with regional stakeholders, existing needs and necessary solutions to develop sustainable transport chains and last-mile solutions.

A workshop can be an effective method for gathering information or opinions from a diverse group of people. It can also be a form where different stakeholders meet and share their experiences and find challenges that pose potential further discussions and encourages collaboration.

The first workshop was held in September this year (2024) as a part of the networking event and on the same theme, Sustainable transports, needs and challenges. The workshop lasted approximately 45 minutes. Participants were divided into two groups, each with a designated note-taker. A representative from the municipality was also present in each group to listen and support the discussions. Each group was provided with a large sheet of paper and Post-it notes. A question was displayed for the group to discuss, and participants wrote down their thoughts and ideas on the Post-it notes. There was a total of three questions, each discussed for 5–10 minutes. After the workshop, the materials were collected for compilation. The two remaining workshops are planned to be organized during the first half of 2025.

4.7. Problems on the way

During the process of mapping and analysing stakeholders, a "wish list" was also created to align with the continued efforts to fulfil the project's objectives. However, it has become evident over time that many of these stakeholders, particularly cargo owners, have shown little interest in participating in meetings, workshops, or longer interviews. Instead, the ongoing work has been adapted to focus on those stakeholders who are willing to collaborate.

In general, stakeholders are open to receiving information but prefer this without any "requirements for reciprocation." Starting the process on such a broad scale, without a concrete case to anchor the work, has made it challenging to foster engagement and clearly define "What's in it for them?"

Furthermore, the fact that a municipality, which can only influence relatively small factors within the supply chain, is leading the initiative may also contribute to the lack of interest. This makes it harder for stakeholders to see how the work could lead to tangible results for them in the end.

4.8. The work forward

Within this process, Kristinehamn aims to support the development of solutions to reduce emissions in (inland) ports and their regional hinterlands. To achieve this goal, it is essential to incorporate regional perspectives. Establishing platforms for stakeholders to gather and discuss challenges, solutions, and collaboration models can be an effective way to strengthen their involvement and collectively build sustainable supply chains through Kristinehamn Municipality.

The continued work within the stakeholder involvement process for Kristinehamn will primarily focus on developing methods to generate interest among stakeholders. This includes defining a clearer and more focused purpose to precisely address "What's in it for them?" to bring together actors from across the supply chain.

Over the next year, the municipality plans to organize additional workshops, networking events, and a larger conference for stakeholders throughout the supply chain, with a focus on collaboration and sustainable transport solutions.

A well-executed process of stakeholder involvement ensures that these perspectives are systematically considered. Additionally, it contributes to the creation of platforms where market actors can meet and collaborate to promote efficient and sustainable transport solutions.

5. The case of Brest

BrestPort is the first commercial port in Britanny. It is critical for the economy, as import node for oil and gas, import and export hub for the agri-food industry with bulk and containerized traffic. Annually, 2 MTons of goods

transit through the port and its 3.2 kms of quays. Another asset, and key activity, is the ship repairing yard. With its very large dry docks (one of the largest in Europe), it specialized itself along time on big complex vessels such as gas carriers, cruise vessels and vessels propelled by LNG.

More recent, and growing, is the offshore wind industry located on a new dedicated terminal capable of supporting very heavy loads: masts, rotors, foundations, and all the components that constitute the offshore wind farms can be produced or imported and stored here before being assembled and installed at sea. BrestPort is part of the ports/airports networks which organize themselves in networks to satisfy the growing needs of the OWE for land and specialized logistic services.

At last, also developing, is the recycling activity with two companies specialized on recycling wood, metals, plastics. Altogether the port counts for almost 100 direct employees and 1500 indirect jobs in the local companies installed in and around the port and working for/with the port activities.

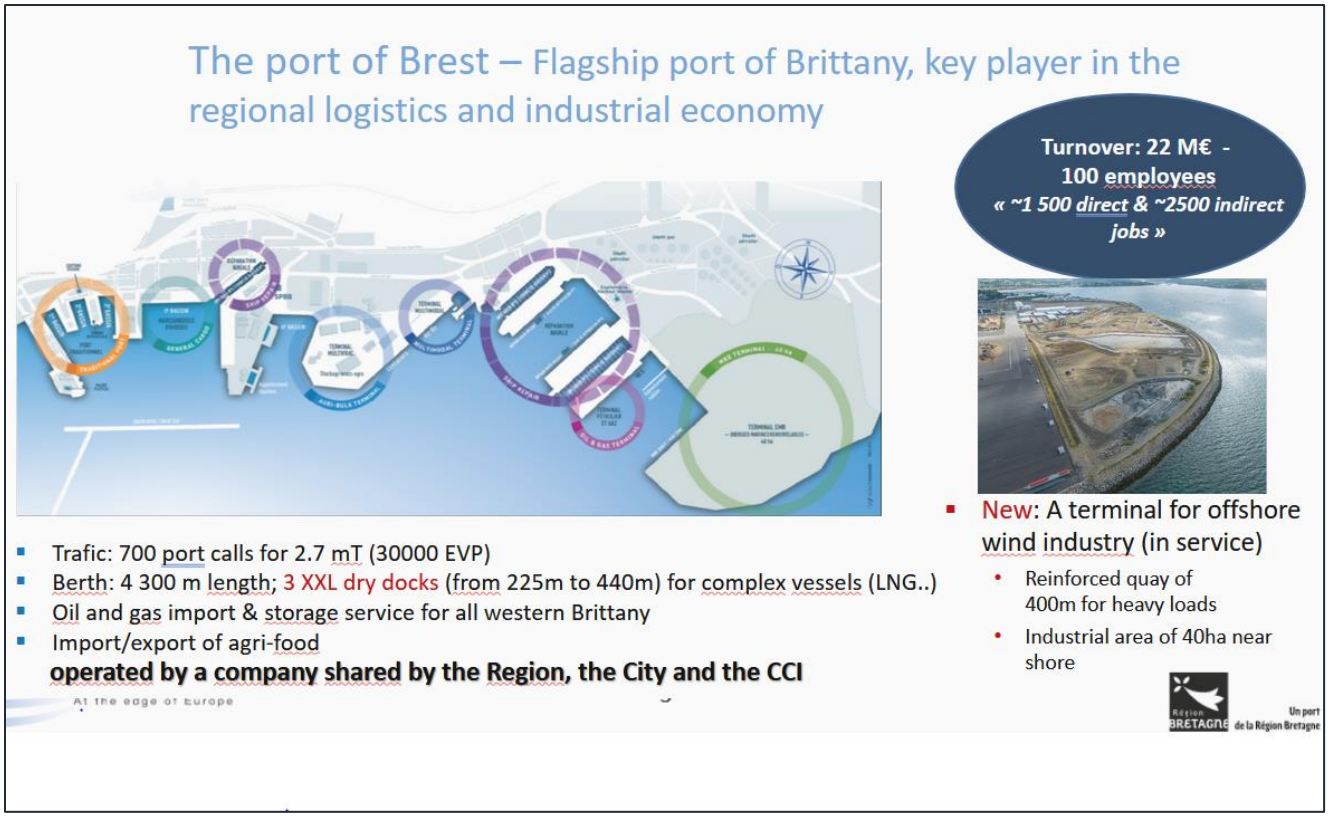

Figure 8: BrestPort in figures

5.1. BrestPort development plan

In 2023 BrestPort produced its development plan for the next 40 years, a work achieved by involving the shareholders first and the stakeholders in a second step. It has been approved end of December 2023, see Figure 10 for an overview.

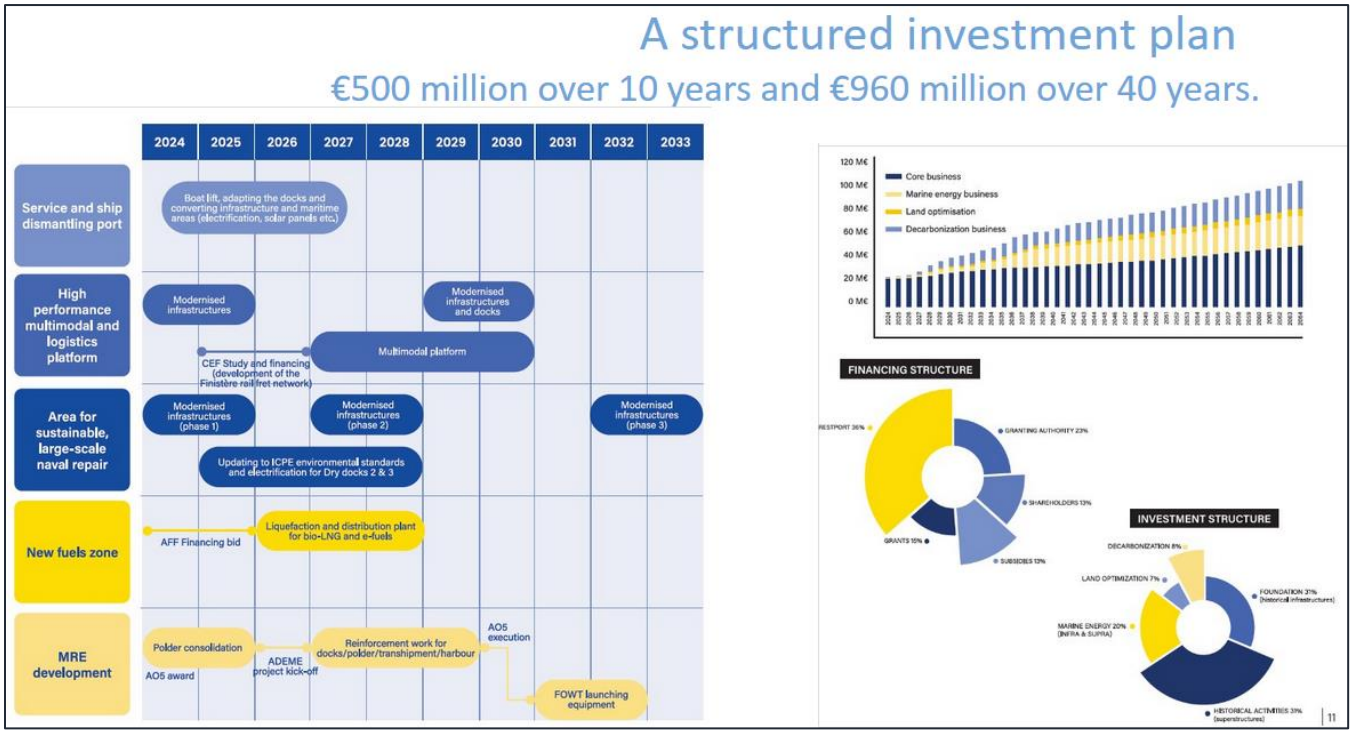

Figure 9: The development plan for the next 40 years

Energy transition is an important part of the port development plan. BrestPort is a node of the TEN-T network. As such it must fulfill the European goals in terms of decarbonation of port activities and provisioning of green fuels and electricity.

The energy transition plan consists of 3 modules:

1. Provisioning of green fuels,
    - starting from bio-LNG (1st phase) to satisfy local needs of ship repairing activities specialized on complex LNG carriers and big vessels a ration of which is propelled by LNG.
    - Studying from now the transition to a second generation of green fuels: H2, methanol, ammonia, e-fuels. This transition phase is still unclear as the technologies are not yet mature, the market is not yet ready and is split between the variety of potential candidate fuels.
2. Provisioning of green electricity
    - Increasing the power of the electric network to satisfy the demand of local industry and logistics, as well as vessels (on shore pwer supply) and trucks disserving the port
    - Producing green renewable electricity, especially from renewable sources such as sun and wind. BrestPort is engaged with a startup company in the test of an innovative foating power plant, an innovative promising technology, still in its infancy
3. Reducing and managing the consumption of energy
    - Analysing the consumptions of the different activities and possible reduction patterns

- Analysing best of solutions for each use case
- Installing energy management systems to smooth pics of consumptions with batteries and genset using bio-LNG; H2 or bio-fuels

Defining a road map for energy transition is complex due to the lack of maturity of the technological solutions, economic sustainability and regulatory bases. The topic requires working in depth with the stakeholders to align the port to local/regional demand but also to the shipping and energy industries road maps. BrestPort can't define the road map alone.

In order to feed local/regional studies with inputs from other larger stakeholders networks, BrestPort decided in 2023 to join several initiatives:

- Conference of logistics: organized and animated by the regional authorities with ORCB (observatory of logistics) and Bretagne Supply Chain an association federating the actors of the logistics chains.
- Movin'on: a network of industrials from ports, energy, transport, shipping, logistics and finance. Their goal: to set out credible, sustainable, common energy transition road maps.
- MEET2050: French initiative from the government to also set out a road map for energy transition of the maritime sector and an action plan to achieve the goal.
- And European projects addressing the transition to H2/green fuels of second generations in the Atlantic area (HYDEA) and in the North Sea (NS H2 Valley Ports) which complete the shorter term GSC goals.

Thus, while starting the "stakeholder involvement" activity, BrestPort can rely upon a preliminary work carried out in 2023-2024 to gather the stakeholders at local/regional, national and European levels.

5.2. BrestPort Community: the local stakeholders

Working on the development plan for the next 40 years has led to create a new brand "BrestPort", a port truly engaged in European ports network. It has also led to better measure the essential role of the local stakeholders in this transition. The transition to a new green development strategy can't be achieved alone. It must be defined and implemented with the stakeholders, at local and European levels. Thus in 2023 was also created "BrestPort Community" a brand and a platform gathering 40 local industries created to motivate these local stakeholders to move together towards a new dynamic and green future, see Figure 11.

Figure 10: BrestPort Community: a brand and a platform to join forces of BrestPort and its industry community

Energy transition is a broad topic, too broad to be treated by a unique stakeholder group with a real investment of these groups and a focal result. Moreover, at least for transition to green fuels we need a larger port community (later "LPC") than the local industry only because energy transition in the maritime sector requires an aligned road map with shipping, energy, logistics, financial actors which are themselves depending on international/European trends.

The stakeholders in BrestPort identifed as important for the energy transition plan are shown in Table 3 below.

Table 4: Stakeholders in Brest and their role in the energy transition (ET) plan

Stakeholder profile	Role in the ET plan	Level of knowledge	How to involve them?
Public stakeholders 1. Local 2. Regional	Local and regional authorities are co-	Low for local authorities	- Local and regional: invited to participate

3. National 4. EU	leaders of the ET plan as shareholders National define the regulations but we can learn together EU-define the EU framework. Dialog is important	Middle or High for regional authorities depending on the topic Middle or high for EU regulations	directly in the Stakeholder group - National: dialog through MEET2050 - European: through workshops and Movin'on
Private sector/ energy consumers 5. Shipping, rail, 6. Logistics, forwarders, agents 7. Energy providers 8. Local industries	All must define their own ET plan. The goal is to cross visions and strategies in order to define a sustainable port "ET" with the whole LPC	High for energy and shipping industries Low for most logistic and local industries	- Elaborate a concrete framework for discussions - Set objectives - Organise meetings to share ideas and visions
Private sector/ technology providers 9. H2, LNG, e-fuels 10. OPS, batteries 11. Energy producers 12. Equipment providers	All are working to progress on their own market field	High knowledge of the current status of technologies and ways forward	- One per one meeting - Invite to meetings with shareholders to share knowledge - Set out means for demonstrations
Finance sector 13. Public 14. Private	All are driven by the "Green Deal" with obligations to invest in "green" transition	Middle level of knowledge of current state of the art and thus ability to adopt one or another solition	- One per one meeting - Involve them in the whole port development plan - Invite to meetings with stakeholders

Thus, the core stakeholders' group is identified. Also, it is essential to structure the "LPC" by thematic working groups, to fix goals which are both interesting for each stakeholder and manageable.

Considering the GSC working structure, decision was taken to organise the LPC in 3 groups (see also Figure 12):

1. Electrification strategies and plans, including the reduction of consumption patterns
2. Green fuels (step 1: bio-LNG as 1st transition step to green fuels; step 2: H2, methanol, ammonia, e-fuels)
3. Joint common road maps

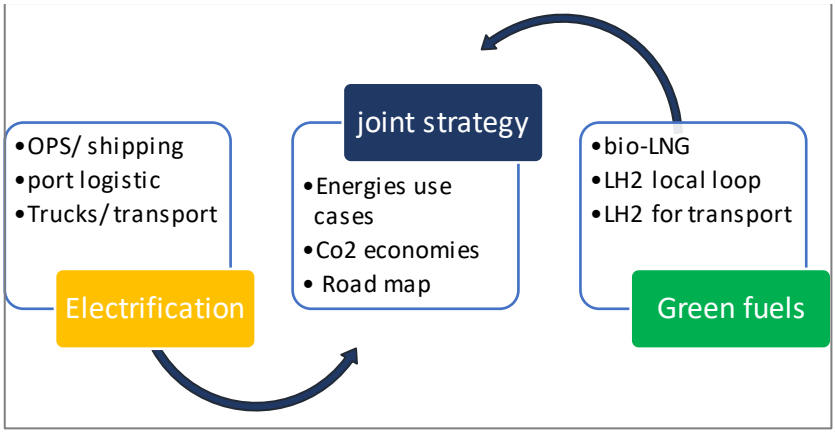

Figure 11: Methodology to elaborate an energy transition road map with the LPC

5.3. Action plan and approach

Starting from the preliminary energy transition path established for BrestPort through its development plan for the next 40 years, the goal during the GSC project is to work on a joint road map with the stakeholders considering first electrification and green fuels independently to finally set out synergies between electrification and green fuels.

Mobilisation of the stakeholders is a progressive and iterative work. The starting point is to constitute the interest groups (step 1) that will be then involved in the study phases (step 2) to finally (step 3) elaborate with them a joint road map/ strategy towards a zero-carbon footprint, see Figure 13.

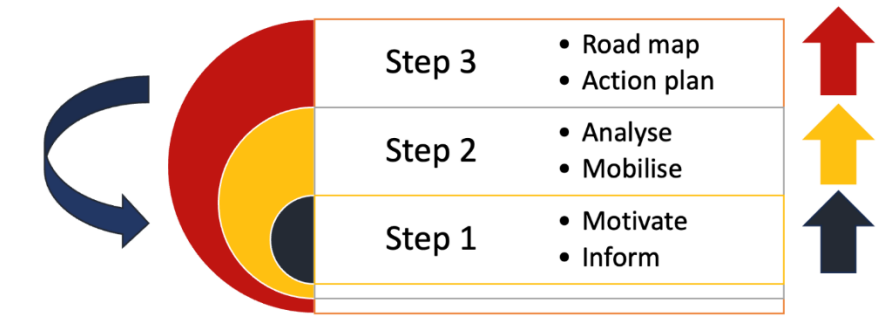

Figure 12: Action plan to involve stakeholders

Step 1: Inform and motivate (January – June 2025)

Even though the stakeholders have been already interviewed to define preliminary road maps for the decarbonisation of the port, GSC goes one step further: to elaborate a common strategy for the port community at large, including the regional logistics.

During the 1st period, the objective is to communicate on the GSC project and its goal to define joint strategies for decarbonation of the port and its stakeholders 'activities, considering two legs: electrification and green fuels.

Action plan:

BrestPort with the support of regional, national and international energy transition working groups will have to identify or define some keys to motivate the LPC to join the GSC initiative, moving from individual to a collective initiative with vision of the future of energy in the port and the hinterland at large. These key motivations will then help defining joint and reachable objectives for the following steps.

The first step is to inform the LPC on GSC with targeted information, explaining the specific challenges of the maritime sectors, the port of Brest and its LPC, and the advantages as well as goals

- Liaison between GSC and electrification goals
- Liaison between GSC and the bio-LNG projet, considered as a 1st energy transition path in BrestPort
- Liaison between GSC and longer-term energy transition goals, H2, ammonia or methanol, which must be analysed in the specific context of BrestPort
- Specific key changes

Deliverable: documents of the communication campaigns

- Brochure or information on GSC explaining the electrification and green fuels
- Studies: calculation of the financial and legal benefits of each leg of the transition path

Step 2 : mobilise and analyse (July – December 2025)

During the following 6 months, the objective is to mobilise and motivate the LPC to participate in joint analyses of each of the 2 legs of the project: a) electrification and b) green fuels

Action plan:

- Analysis: of a) the situation; b) the blockage; c) solutions to reduce the consumption of energy and to reduce the carbon footprint of all transport/ logistics activities in and from/to the port using either green electricity or green fuels.
- Reporting: The LPC will be invited to face to face meetings and workshops to discuss the results of the analysis.

As said before; to go in depth into the analyses, it is necessary to provide clear objectives to the stakeholders. Therefore, the work will be carried out independently for green electricity and green fuels.

Deliverables (December 2025):

- Report on the vision of the GSC community regarding joint decarbonization paths, considering electrification and green fuels.
- Update of the brochure

Step 3: define joint strategies, road maps and action plan (January – June 2026)

During the following 6 months the objective is to elaborate joint strategies for decarbonation of the port and the LPC at large (including the logistics serving the hinterland), setting out synergies between electricity and green fuels as alternatives to current carbon-based energy.

Action plan:

- Road map for electrification of port and logistic activities
- Road map for a transition to green fuels considering foreseen fuels at horizons 2030 and 2050
- Integrated road map towards a zero-emission port and logistic
- Cost/benefit analysis considering the key motivations identified in steps 1 and 2

Deliverables (June 2026):

- Integrated road map towards a zero-emission port and logistic
- Cost/benefit analysis of the collective road map
- Update of the brochure

5.4. Summary BrestPort

Setting out common objectives and motivations will be keys to success. Moreover, energy transition in ports and the maritime sectors requires involving a larger community than the local one.

Thus, to carry out the energy transition plan, BrestPort intends to reinforce previous actions engaged with regional/ national working groups (regional logistics conferences, MEET2050) and European ones (with other EU projects and Movin'on). This will be determinant to identify credible transition paths and financial, legal or operational benefits, motivating the LPC to work with us for a collective road map towards a zero port/ hinterland.

6. Conclusion and next steps

The transition toward sustainable logistics and energy systems is both a necessity and an opportunity for ports to drive decarbonization and improve operational efficiency. This report presents and emphasizes the importance of a structured stakeholder engagement strategy to address the unique challenges and opportunities of port electrification and energy transition. By aligning the environmental and operational objectives of ports with the broader logistical and energy needs of surrounding regions, stakeholders can collaboratively achieve impactful, sustainable outcomes.

The analysis highlights key areas requiring immediate attention, including overcoming infrastructure limitations, addressing regulatory hurdles, fostering innovation in renewable energy solutions, and reconciling diverse stakeholder views. A multi-faceted approach-rooted in collaboration, transparency, and continuous evaluation is essential to successfully navigate the complexities of sustainable port operations.

As the next steps:

Refine and Implement the Stakeholder Engagement Plan:

- Initiate workshops, focus groups, and consultations with identified stakeholders to fine-tune goals and align priorities.
- Develop a joint roadmap with concrete deliverables, clearly defined roles, and timelines for implementation.

Enhance Infrastructure and Technology Readiness:

- Prioritize investments in electrification infrastructure, alternative fuel systems, and smart technologies to support efficient and low-carbon operations.
- Collaborate with stakeholders to address standardization challenges and build scalable solutions for diverse port and transport environments.

Strengthen Monitoring and Reporting Mechanisms:

- Establish a robust system for documenting progress, updating stakeholders, and measuring the effectiveness of engagement strategies.
- Regularly report outcomes to all stakeholders and adjust plans based on feedback and evolving conditions.

Foster Regional and International Collaboration:

- Expand partnerships with ports, policymakers, and industry players to exchange best practices and drive collective progress in achieving sustainability goals.
- Leverage insights from this report to inform decision-making and funding applications, ensuring alignment with both local needs and global environmental commitments.

By taking these actions, ports can position themselves as leaders in sustainable logistics and energy systems, advancing the Green Supply Chains initiative while contributing to global decarbonization efforts.

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