

ANNUAL PROGRESS REPORT ON GREEN SHIPPING CORRIDORS

2022



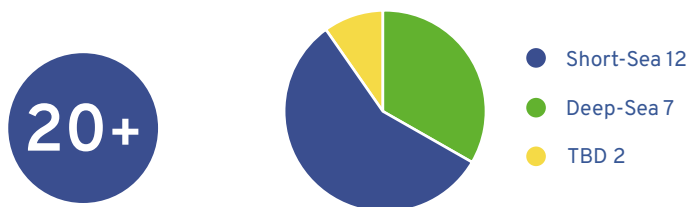
Executive summary

Green shipping corridors are increasingly viewed as an essential tool to kick-start shipping's transition to zero emissions. Starting from today, when essentially all shipping fuels are fossil-based, the sector will need to reach a tipping point by 2030, when 5% of shipping fuels are scalable zero-emission fuels that can be rolled out across the industry. Green corridors – specific shipping routes where the feasibility of zero-emission shipping is catalyzed by a combination of public and private actions – can provide the context for the testing, demonstration, and at-scale deployment needed to get to 5%.

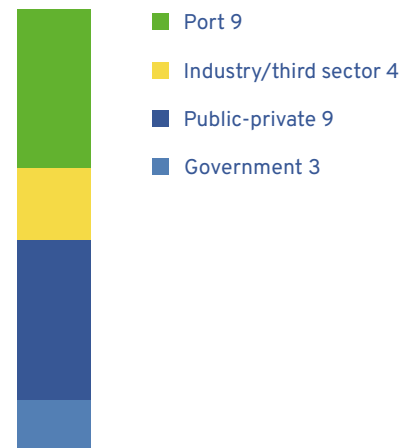
The first annual **Progress Report on Green Shipping Corridors** provides a checkpoint for what has already become a movement. The report evaluates:

- The size, nature, and performance of the global portfolio of green corridor initiatives;
- The amount and nature of national policy and regulation emerging to support these initiatives; and
- The overall momentum behind the movement.

Initiatives



Leadership



Stakeholders



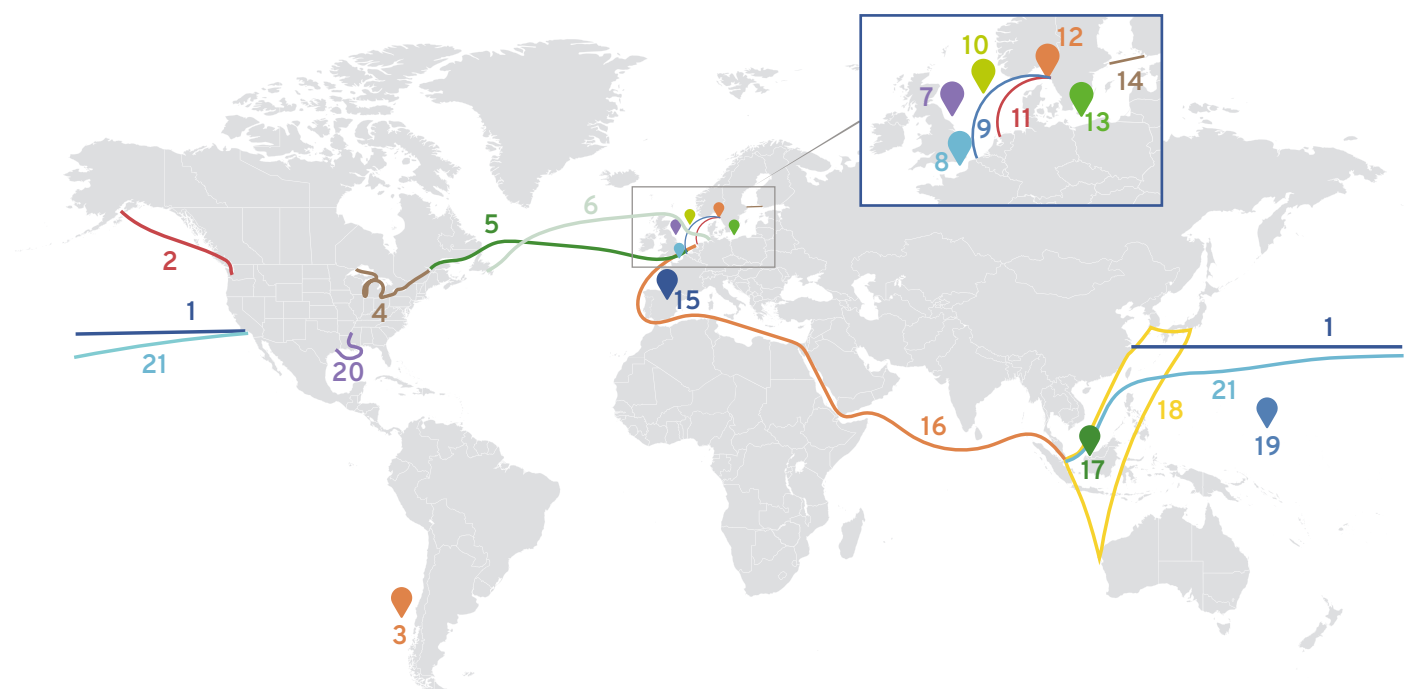
covering the whole value chain

Targets



- implementation by 2027-2030
- most are TBD

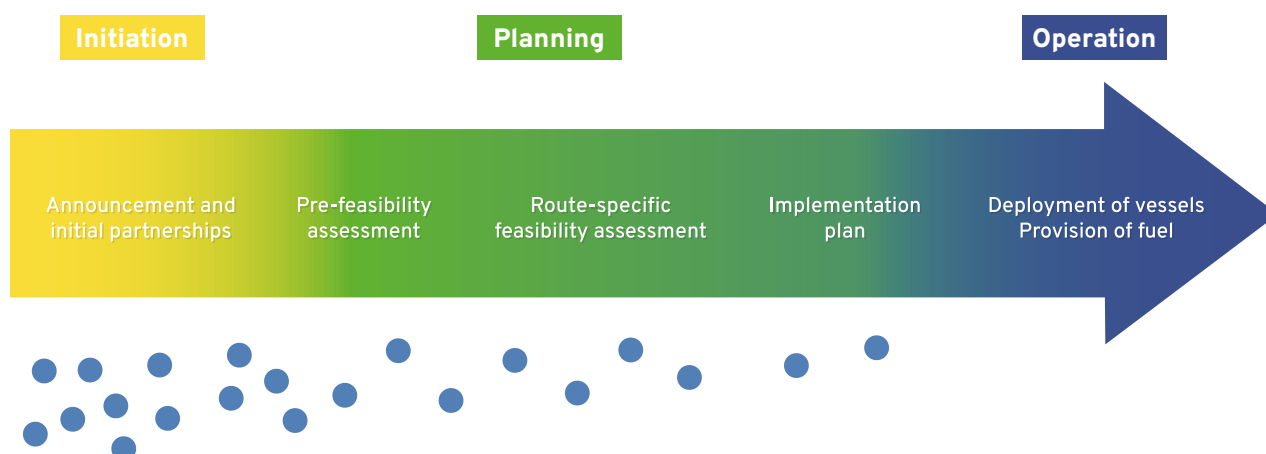
In the year since the signing of the Clydebank Declaration, 21 initiatives have emerged around the world. More than 110 stakeholders from across the value chain are engaged in these initiatives, and a significant level of public-private collaboration can be seen.



- | | | |
|---|-------------------------------------|--------------------------------------|
| 1. Shanghai- LA | 8. Dover-Calais/Dunkirk | 15. Green Corridors Spain |
| 2. Alaska, British Columbia, Washington | 9. Gothenburg-North Sea Port | 16. Rotterdam- Singapore |
| 3. Chilean Green Corridor Network | 10. H2 powered North Sea Crossing | 17. SILK Alliance |
| 4. Great Lakes- St. Lawrence | 11. Gothenburg-Rotterdam | 18. Aus-Asia Iron Ore |
| 5. Antwerp-Montreal | 12. European Green Corridor Network | 19. QUAD Shipping Taskforce |
| 6. Halifax-Hamburg | 13. Nordic Regional Corridors | 20. Gulf of Mexico |
| 7. Clean Tyne Corridor | 14. Decatrip | 21. Los Angeles-Long Beach-Singapore |

Indicative – ports and routing not necessarily representative

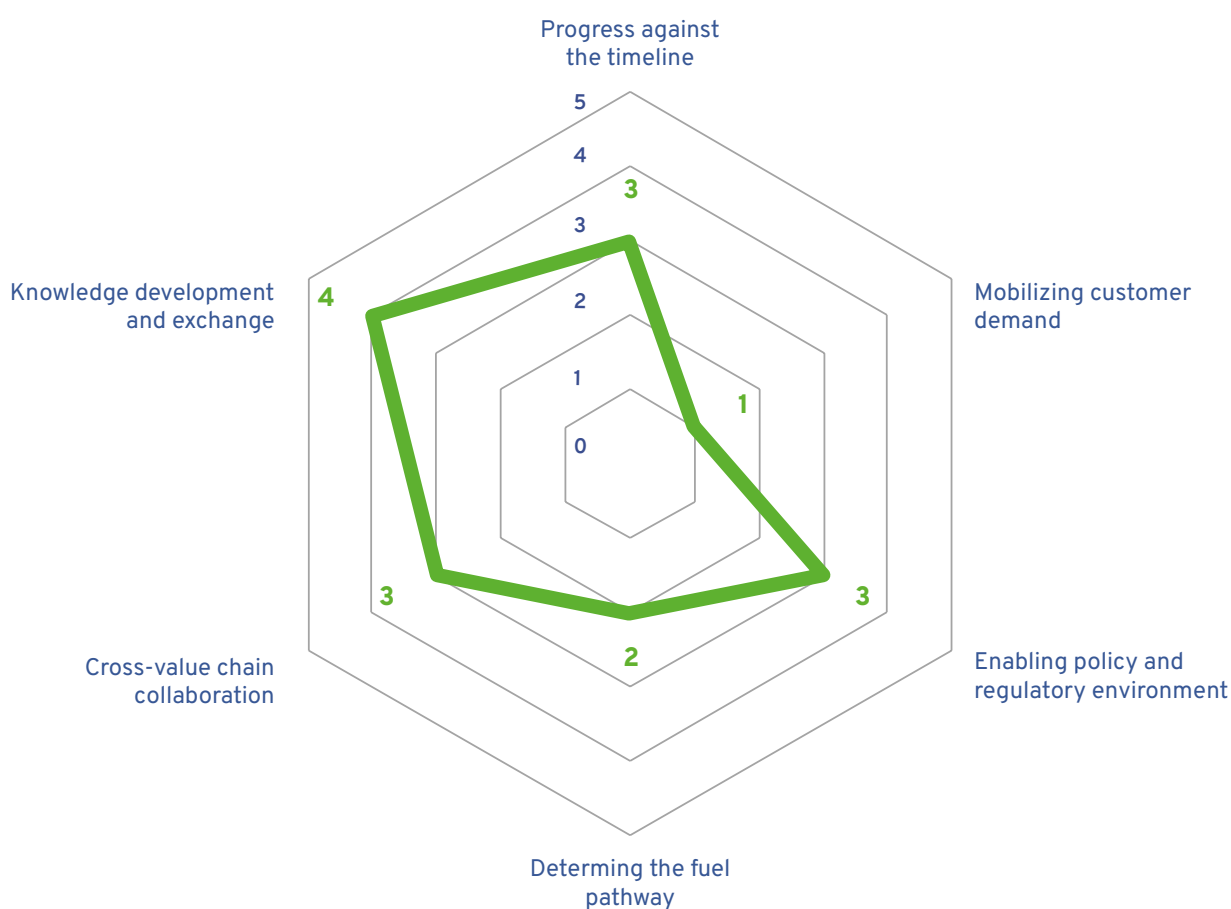
These initiatives cover multiple geographies and many of the world's most important deep-sea shipping routes. Notable clusters of activity have emerged in the North/Baltic Sea region.



The vast majority of these initiatives, however, remain at an early stage. Only a handful have advanced far enough to begin feasibility assessments or implementation planning.

Nonetheless, the report considers the sector to have made some meaningful progress against the timeline to 2030. The generation and sharing of knowledge around green corridors has also been a positive sign, as have the efforts by the signatory governments of the Clydebank Declaration to provide policy support.

One major challenge has been defining a fuel pathway. While Green Corridors should provide a simpler context for decisions about future fuels, many initiatives remain undecided about where to focus. Finally, while a broad range of stakeholders has been engaged, the crucial voices of cargo owners, whose needs will help define the business models to be developed in corridors, are underrepresented.



The report has developed the following seven recommendations to support accelerated and more impactful green corridors:

1. Involve key stakeholders early in the process – especially cargo owners and fuel producers.
2. Use national policy support to close the fuel cost gap for zero-emission shipping – through contracts for difference or other targeted support for shipping fuels.
3. Think more critically about the prioritization of corridors – to ensure that governments are supporting impactful and feasible first mover routes.
4. Strive for specificity on fuel pathways where possible – to maximize and accelerate the impact of green corridors.
5. Prioritize learning by doing – rather than standardized templates for action.
6. Focus on the technology transition to 2030 – green corridors are about getting to the tipping point, rather than delivering immediate emissions reductions.
7. Explore mechanisms for green corridors to contribute toward an equitable transition – making the technologies and knowledge generated available in the Global South will be crucial for the long-term transition

This report has been produced by the Global Maritime Forum on behalf of the Getting to Zero Coalition. The views expressed are the authors' alone.

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The Global Maritime Forum would like to thank the representatives of green shipping corridor initiatives and Clydebank Declaration signatories for their support in the preparation of this report.



Voices from the Corridors

"As long as the large price gap between existing and new alternative fuels remains, we cannot reach the needed offtake agreements for the new fuels to go into production. It is hence important that all involved stakeholders do their utmost to cover this price gap and when this cannot be achieved, we need the governments to step in."

*Edvard Molitor, Head of Sustainability, Port of Gothenburg,
Gothenburg-North Sea Port, Gothenburg - Rotterdam Green Corridor*

"Many green corridor initiatives at the moment seem to focus on finding replicable methodology, while there is much more need to focus on the process of learning by doing."

*Carlo Raucci, Marine Decarbonisation Consultant,
Lloyd's Register / The Silk Alliance*

"Identifying final customers who wish to reduce the impact of the shipping in their overall GHG profile may help to convince shipping lines to go greener, thus facilitating the implementation of specific green corridors."

*Tim Verhoeven, Projects & Policy Manager Sustainable Shipping, Port of
Antwerp-Bruges
Representative from Antwerp-Montreal Green Corridor*

"The corridors need to balance building on others' knowledge and making the decisions for themselves. Uncertainty leads to a situation where everyone follows whomever is leading the fuel conversation and assumptions don't necessarily get challenged."

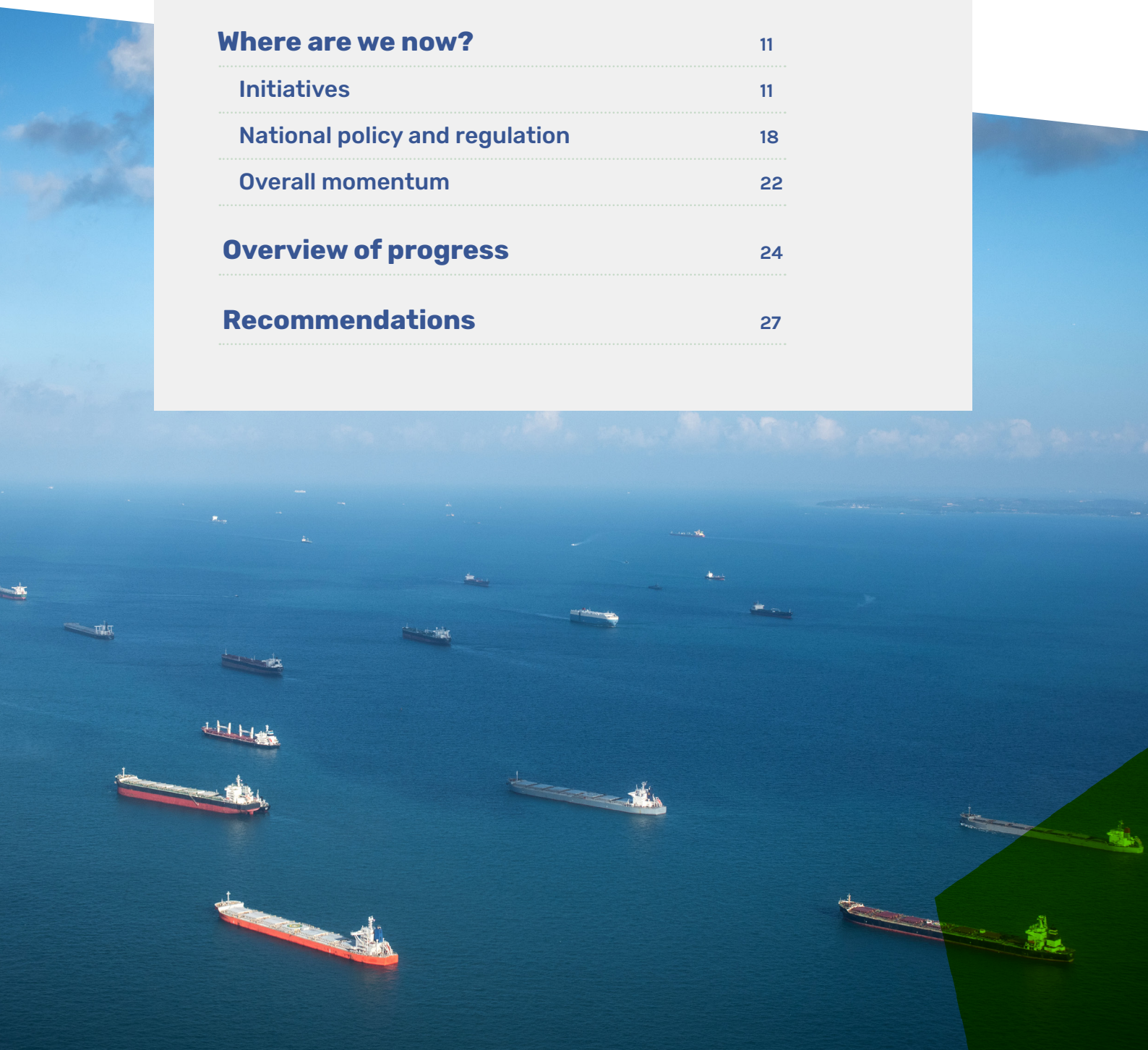
*Saskia Mureau, Director Logistics & Digital,
Port of Rotterdam / Rotterdam-Singapore Green and Digital Corridor*

"Governments can implement policies and incentives to enable early action and provide a level playing field. Governments can also support public private collaborations which are necessary for green corridors to be successful."

Alisa Kreyne, Head of Ports & Shipping, C40 / Shanghai-LA Green Corridor

Contents

Executive summary	1
Introduction	7
Where do we need to be?	10
Overview of the existing objectives	10
Portfolio by 2030	10
Where are we now?	11
Initiatives	11
National policy and regulation	18
Overall momentum	22
Overview of progress	24
Recommendations	27



Introduction

For shipping's decarbonization to get on track, it is estimated that 5% of fuels will have to be scalable zero-emission fuels by 2030. Green corridors are now widely acknowledged as a key mechanism to help industry reach this tipping point and enable rapid decarbonization from 2030 onwards.

The tight timeframe dictates that the green corridor movement advances at a fast pace. Recognizing the urgency of the challenge, a group of governments agreed to support the establishment of green corridors and came together to sign the Clydebank Declaration for Green Shipping Corridors at COP26, in November 2021. Since then, the movement has been gaining traction, with new initiatives announced almost every month.

For green corridors to have the desired impact, there is a need to keep the level of ambition high while being realistic about the limitations imposed by the timeline. Particularly at these early and in many ways defining stages of the movement, there is a need to maintain momentum and push for more action, while simultaneously making sure that efforts do not go in the wrong direction. Finally, since one key impact mechanism behind green corridors is accelerating the industry's learning, the knowledge generated within individual initiatives must spill over to the rest of the shipping community. An annual progress report helps address all these needs by looking at how the green corridor movement as a whole has been developing, summarizing the main learnings and outlining the main areas for improvement.

This is the first report of the series, and as such, in addition to tracking progress, it establishes a baseline against which future progress will be measured. The importance of this progress report will only grow as the portfolio of initiatives becomes more complex, but the methodology for future editions is likely to evolve as the corridors themselves advance towards implementation.

This edition of the report will track progress on the global portfolio of green corridor initiatives, national policy and regulation efforts and the overall momentum of the movement.



Initiatives

- **Scope**
Corridors announced up until November 2022
- **Quantitative analysis**
- **Method**
Desk research, surveys/ interviews with the initiatives (15 respondents)



National policy and regulation

- **Scope**
Clydebank signatories
- **Qualitative analysis**
- **Method**
Desk research, survey for Clydebank governments (15 respondents)



Overall momentum

- **Scope**
Events, reports, tools
- **Qualitative analysis**
- **Method**
Desk research

Green corridor initiatives at all stages of development are included in the analysis, from announcements and initial partnerships to implementation. Fuel exporting/importing initiatives, vessel orders, isolated pilot projects and other initiatives without an infrastructure element were excluded from the analysis on account of not being in line with most of the available definitions of green corridors. The portfolio of initiatives was analyzed in terms of development stage, geographic distribution, stakeholders involved, shipping segments and fuels of choice.

The national policy and regulation pillar tracks progress the Clydebank governments have made in advancing and supporting green corridors by highlighting the main types of policy support offered. This section is limited to Clydebank governments, in so far as the signing of the Clydebank Declaration gave an indication of countries' strategic interest in advancing green corridors. The authors acknowledge that other countries may also be looking into relevant policies and regulation to support green corridors and that international policy also has a role to play.

To evaluate overall momentum, the report describes events, reports and other sense-making efforts as proxy indicators for the level of general traction the green corridor movement has gained in the last year.

The report then assesses this progress against a set of criteria, consisting of the four “building blocks” of green corridors laid out in The [Next Wave](#) report, as well as two additional parameters related to the goals of the movement.

The final set of criteria for assessing progress are:

- Mobilization of customer demand
- Determination of fuel pathway
- Cross-value chain collaboration
- Enabling policy and regulatory environment
- Knowledge development and exchange
- Progress against the timeline

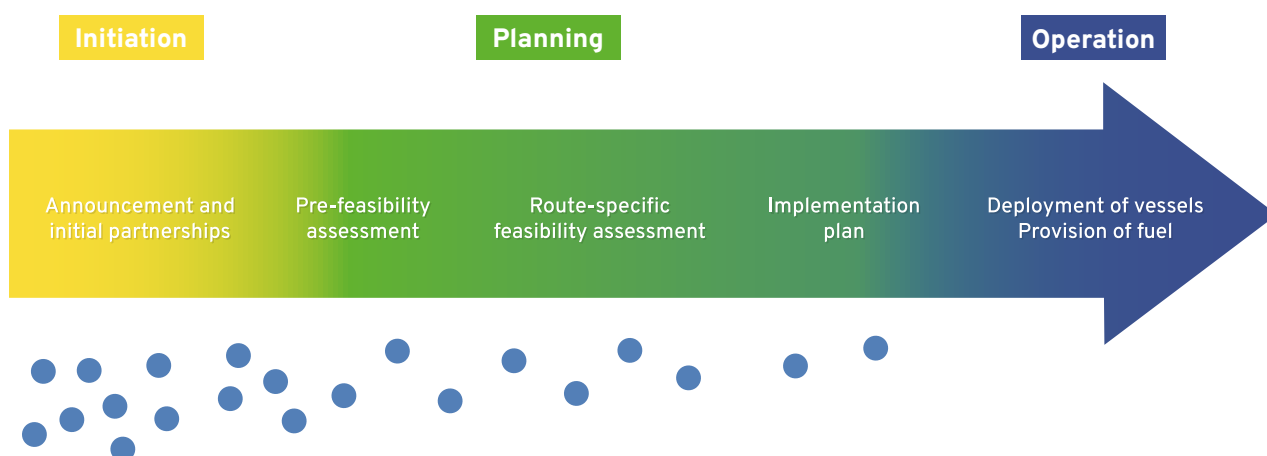
Finally, we provide recommendations on priority next steps to help the movement achieve its goal of accelerating the transition to zero-emission shipping.



On green shipping corridors

Green corridors are here defined as specific shipping routes where the technological, economic and regulatory feasibility of zero-emission shipping is catalyzed by a combination of public and private actions.

While each corridor's journey is likely to be different and depend on factors such as where the initiative comes from, the main development phases from initiation to operation can be summarized in the picture below.

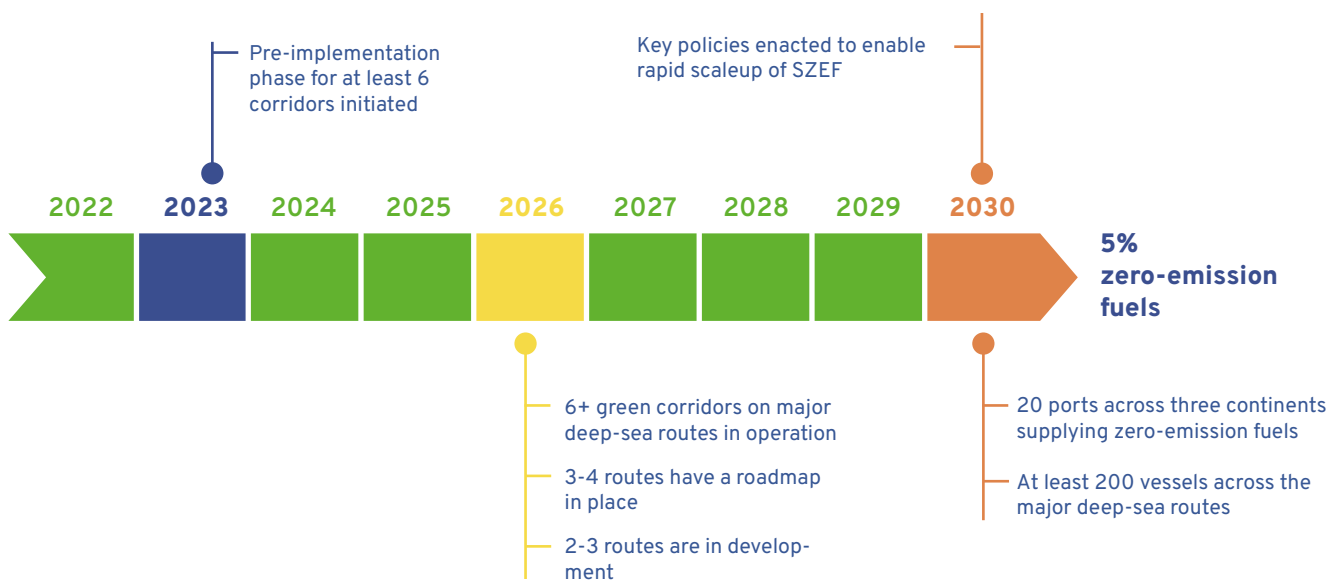


Announcements, initial partnerships and pre-feasibility assessments of potential routes often, but not always, mark the first steps in developing a green shipping corridor. Route-specific assessments of the technical and economic feasibility of a given route or routes follows, with the planning phase culminating in the development of an implementation plan or routemap for the corridor. Finally, deployment of vessels and provision of scalable zero-emission fuels mark the beginning of the operation phase.

Where do we need to be?

Existing objectives

Several proponents of green shipping corridors have laid out several objectives that the movement has to achieve to reach the 5% zero-emission fuel goal. The objectives cover elements such as the number of corridors (Global Maritime Forum/C40, Clydebank Declaration), the number of vessels on the corridors (Zero Emission Shipping Mission), the level of fuel adoption (Getting to Zero Coalition, ZESM) and the enabling environment (Global Maritime Forum/C40). An overview of the existing objectives is found below:



The timeline highlights the importance of the movement gaining both scale and speed, and demonstrates how crucial the first two years of the movement are for reaching the intermediate milestones, the 2030 goal and the ultimate impact goal of enabling full decarbonization of shipping by no later than 2050.

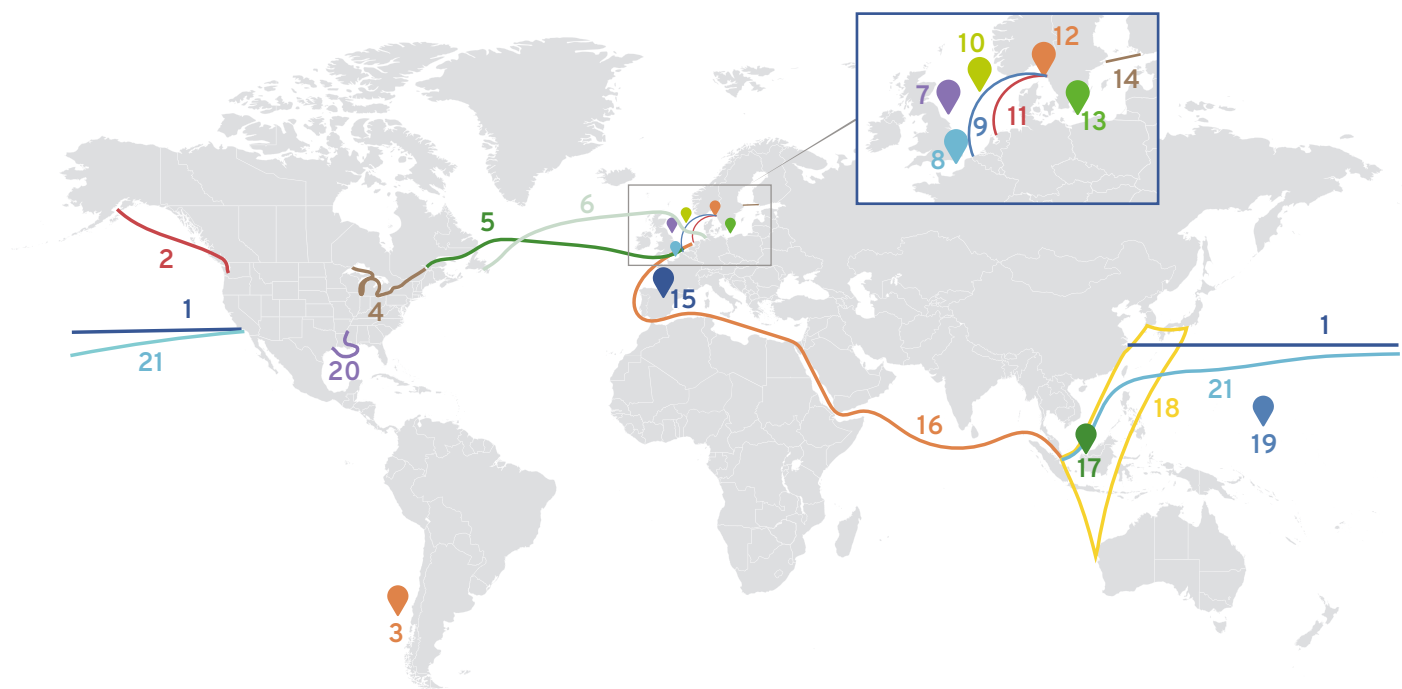
Portfolio by 2030

To maximize the likelihood of reaching these objectives, a geographically and technologically diversified and robust portfolio of well-networked initiatives must emerge that takes advantage of the necessary conditions to enable a rapid scale up of SZEf from 2030. By 2030 the portfolio of initiatives should:

- Have reached critical mass in terms of number of vessels and quantity of fuels
- Cover all major segments of international shipping
- Cover a variety of zero-emission fuels
- Be well distributed geographically, and cover several major deep-sea routes
- Be well-connected through networks and other platforms for knowledge exchange

Where are we now?

Initiatives



1. Shanghai- LA
2. Alaska, British Columbia, Washington
3. Chilean Green Corridor Network
4. Great Lakes- St. Lawrence
5. Antwerp-Montreal
6. Halifax-Hamburg
7. Clean Tyne Corridor

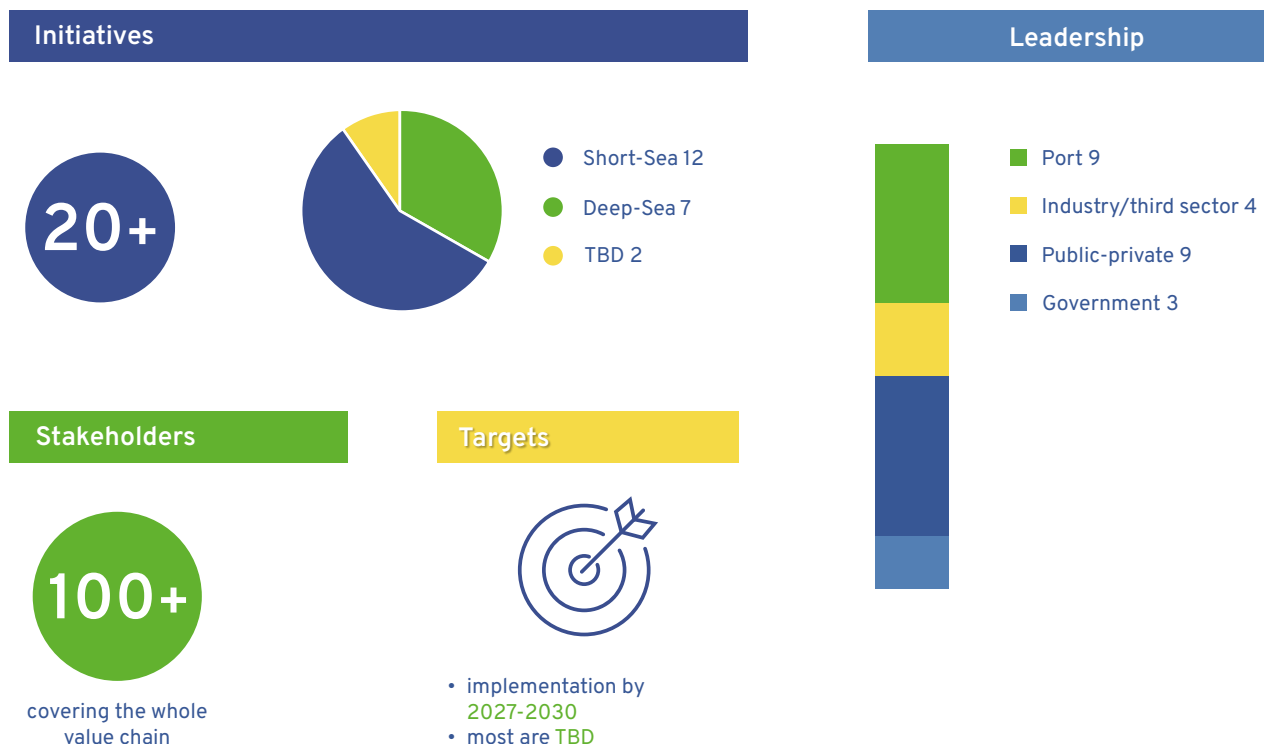
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Indicative – ports and routing not necessarily representative

Global overview

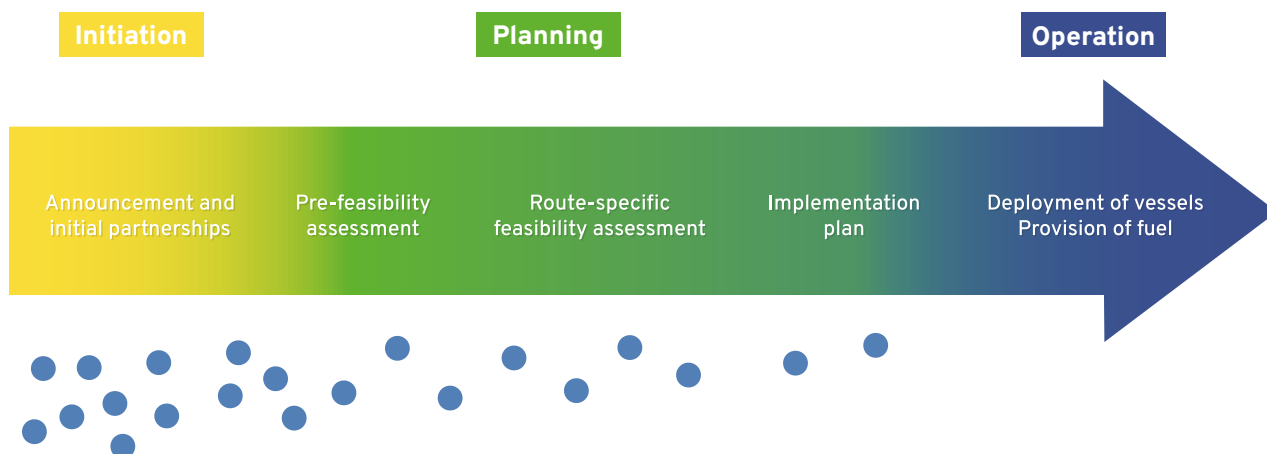
In the year following the launch of the Clydebank Declaration, the global green corridor movement has grown to include 21 initiatives, bringing together more than 110 stakeholders across the whole value chain.



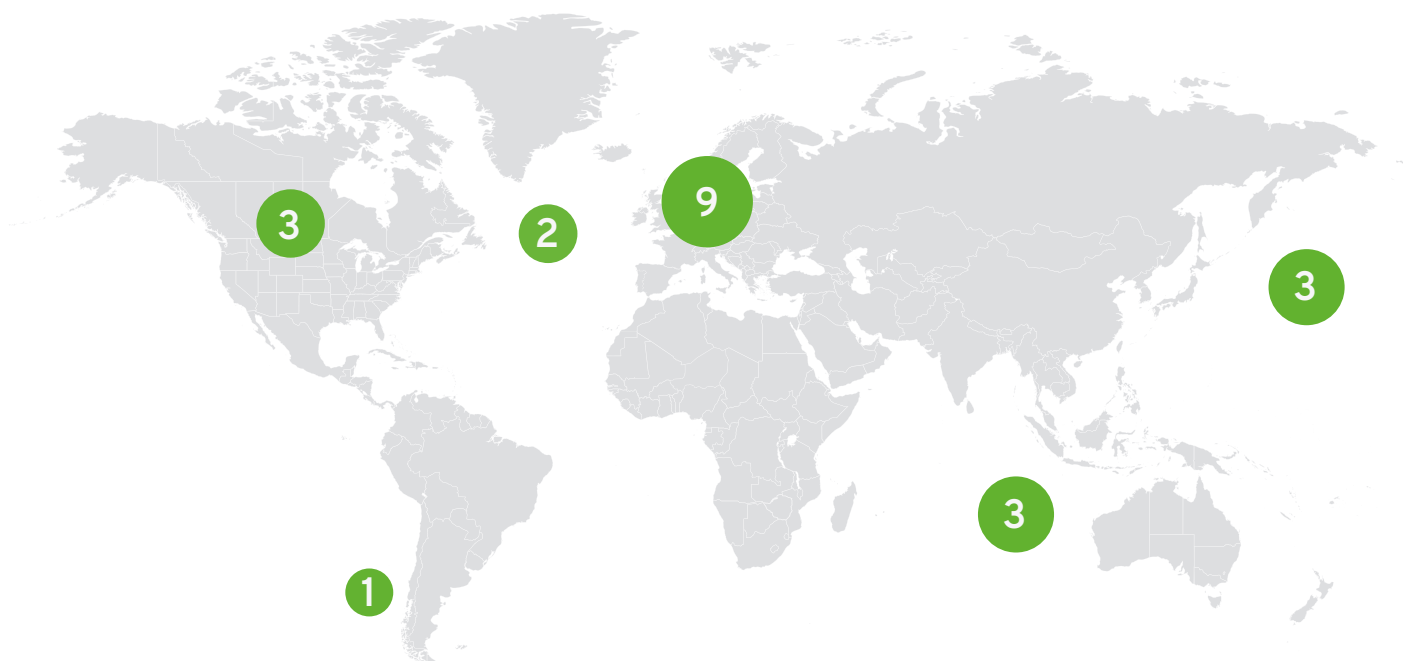
Existing targets set by the initiatives generally point towards implementation by 2027-2030, and center around either decarbonizing the route or introducing the first zero-emission vessels within that timeframe. For over half of the initiatives, however, the target and ambition level have yet to be decided.

Both the public and the private sector have demonstrated a high degree of initiative and cooperation in leading the emerging green corridors, with 12 initiatives featuring participation by the public sector. The most prominent leadership category is public-private leadership (nine initiatives), indicating corridors that have either been initiated by the governments in collaboration with a knowledge partner, or are recipients of public funding. The remaining initiatives see a roughly equal split between those led solely by the governments (3), ports (5), and the rest of the shipping industry (4).

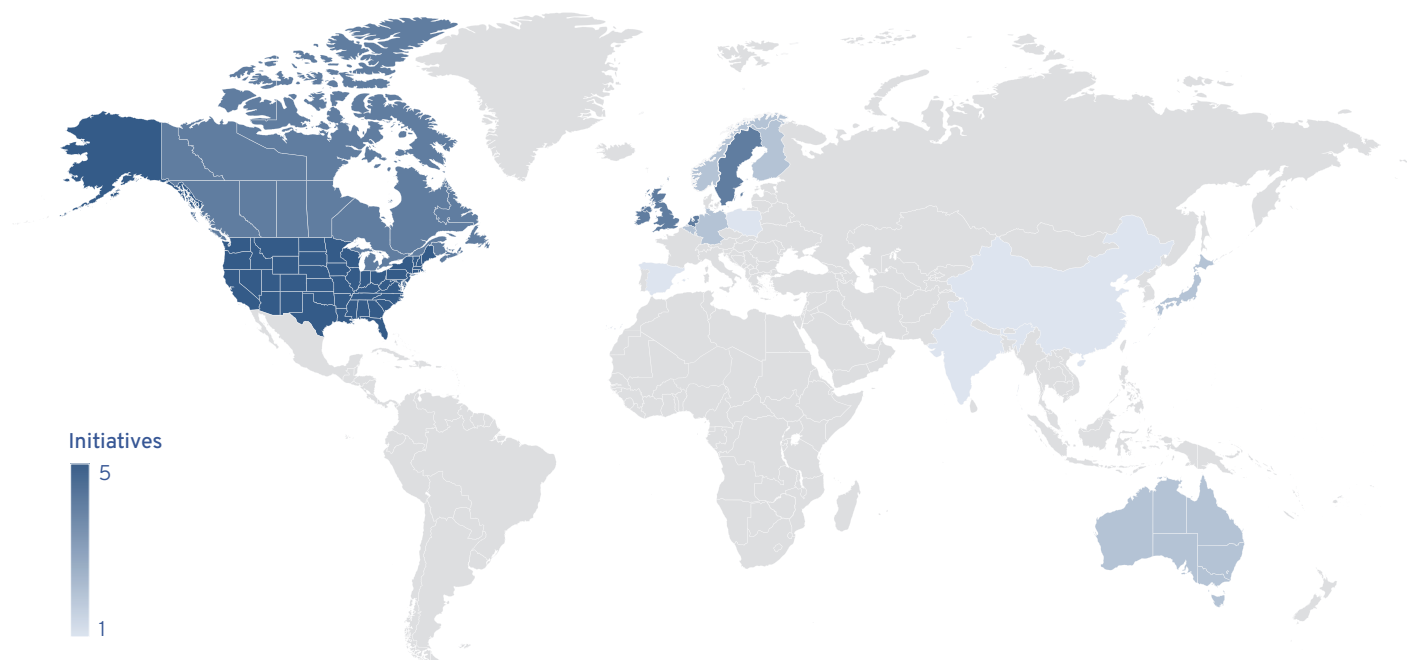
The current development stages of the initiatives range from announcements and assessments of routes for potential corridors to developing a route-specific implementation plan, with at least two plans expected to be released by the end of 2022. Only about a third of all initiatives have made their way to the route-specific feasibility assessment phase.



In terms of geography, over half of the initiatives cover short-sea routes (12), with an additional seven covering deep-sea, and two yet to be determined. Short-sea routes in the Baltic and the North Seas represent the biggest geographic cluster, followed by corridors in the Transpacific, Asia Pacific and North America regions. In addition, two Transatlantic corridors have been announced, and one South American initiative that may result in one or several intercontinental routes.

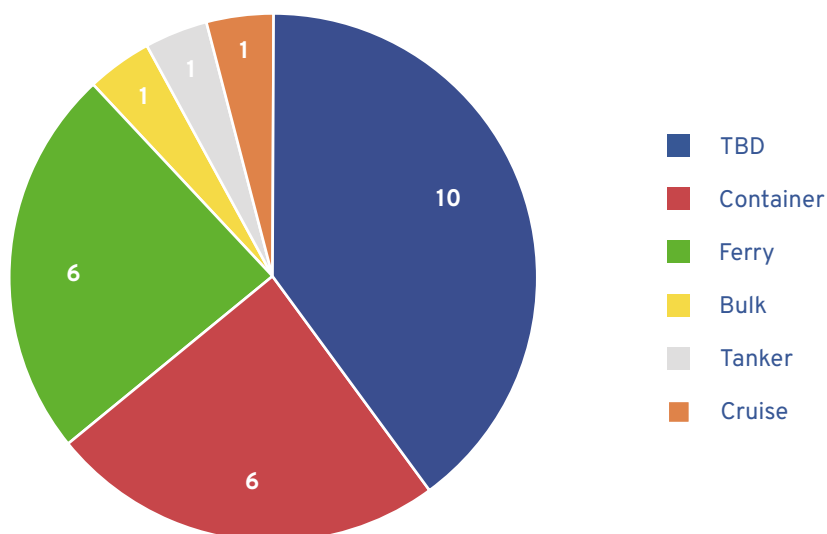


The potential endpoints of future corridors are located in 20 countries (16 developed and four developing nations) across five continents, with big clusters of activity in North America, Northern Europe and the Asia Pacific regions.



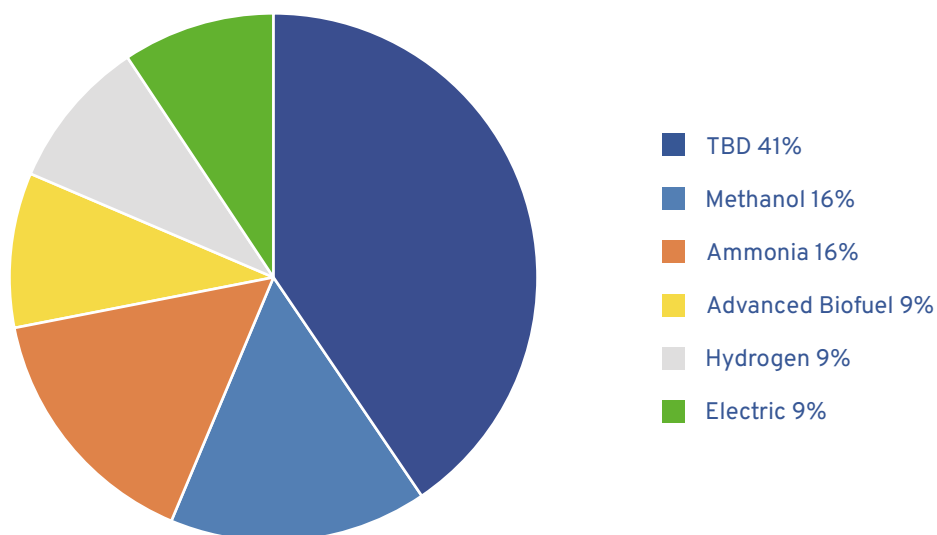
Shipping segments

Container shipping and ferries represent the two biggest shipping segments, each subject of six green corridor initiatives. Dry bulk, tanker and cruise segments are also represented. For 10 of the corridors at the announcement and pre-feasibility stages, the decision as for which shipping segment to focus on is still to be made. For some initiatives, a segment of choice represents the starting point of efforts, with potential future inclusion of other segments.



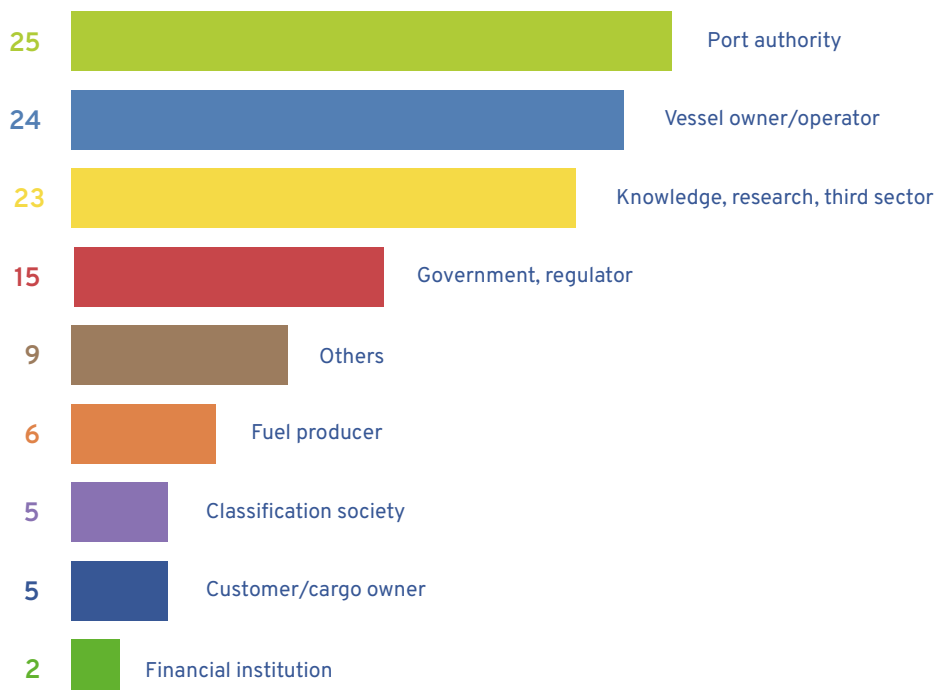
Energy sources

The energy sources mentioned cover many of the existing alternatives, reflecting the prevailing uncertainties and diversity of views within the industry regarding zero-emission fuels of the future. Eight initiatives indicate one or several fuels of choice. For most, final fuel decisions are still to be made.



Stakeholders

The green corridor movement has attracted 113 stakeholders covering all major parts of the value chain.



In some projects, we are seeing high stakeholder complexity, with six being the average number of stakeholders represented. Six initiatives feature 10 or more participants, and eight initiatives feature four or more stakeholder types.

The shipping companies represented include eight of the biggest container shipping companies, together accounting for 85% of global TEU, and the two biggest dry bulk carrier companies, covering 9% of global dwt. Ports from 15 countries joined the movement, including seven of the biggest bunkering hubs (Singapore, Rotterdam, Antwerp, Houston, Shanghai, Los Angeles, Mumbai). Five ports and five shipping companies chose to participate in more than one initiative, potentially indicating the growing strategic importance of green shipping corridors for these stakeholder categories.

At the same time, only one initiative includes all key stakeholder types (cargo owners, shipping companies, fuel producers, regulators and port authorities). An additional five initiatives feature two or three key stakeholder types. The six fuel producers and four cargo owners/cargo owner associations present are split across just two initiatives. The two financial institutions involved are part of the same initiative.



Challenges for the initiatives

The corridors have to navigate a multi-stakeholder, cross-sector, competitive context, which poses many challenges. With the large number of stakeholders of different types and geographies needed to advance a green corridor, building the necessary trust, setting common objectives, and making decisions and commitments all become complicated. As the movement progresses towards wider inclusion of non-shipping actors, such as fuel producers and cargo owners, this challenge is expected to become even more apparent.

Since many corridors will necessarily feature competitors, sharing information within corridors often represents a bottleneck. Coming up with appropriate governance structures to address this issue and generally steer the efforts has so far proven to be challenging.

Concerns related to fuel were mentioned by all the respondents and include zero-emission fuel availability, price, and regulatory environment. As more corridors move from planning to implementation, fuel-related challenges are expected to become even more pressing.

Additional challenges include identifying and attracting key stakeholders such as cargo owners, funding for feasibility studies and internal resources in the participating organizations, and the abstract nature of the green corridor concept itself. Finally, challenges faced are likely to vary depending on the shipping segment, due to differences in business models, energy demands, and operational profiles between the segments.

The initiatives see a significant role for national governments in alleviating some of these challenges. The types of policy support most commonly requested by the initiatives are:

- Direct government participation in initiatives through participating in implementation plans, funding feasibility assessments, etc.
- Key principles to guide the development of the corridors and establish consistency across borders
- Lobbying for regulatory feasibility of the corridors in the IMO
- R&D policy, including both funding for new technologies and fast-tracking approval processes – the hardware and software of corridors
- Fuel policy to provide investment certainty, including long-term (shipping-focused) national fuel frameworks and related economic instruments to close the cost gap
- Facilitating knowledge exchange between the initiatives



National policy and regulation

Since the launch of the Clydebank Declaration, many of the Clydebank governments have implemented or discussed efforts to support green corridors. At present, countries' focus is on providing funding, facilitating stakeholder dialogue and international cooperation, offering conceptual support and guidance, conducting country-level assessments, and working on the national fuel policy. Overall, the countries stated that they appreciate the flexibility embedded in the Clydebank Declaration and pointed out that the most appropriate national policy measures and role for the national governments will likely depend on the local context and their stakeholders' actions.

Funding

At least 10 Clydebank governments are either currently providing or considering offering funding to support various aspects of green corridor development, such as technologies and infrastructure. Most countries indicate that this will likely be done through the existing national funding mechanisms, both shipping specific and cross-sectoral - at the intersection of transportation and energy.

So far, more than \$3m in direct funding has been allocated to four initiatives in Northern Europe. the Nordic Council of Ministers has commissioned an assessment of routes, Business Finland has provided funding to Turku-Stockholm corridor, the United Kingdom has funded three green corridor initiatives as part of the UK SHORE Clean Maritime Demonstration Competition, through a package targeting detailed feasibility studies on UK international and non-ferry domestic green corridors.

Maritime Zero 2050, an initiative by the Research Council of Norway, funds development of zero emission solutions for large ships sailing long distances. Denmark has allocated funding for the transition of national ferries and for investment in green infrastructure at ports.

The Norwegian Enova program is supporting hydrogen projects in the maritime industry with over \$100 million split across hydrogen production and bunkering and vessel development projects. Australia is funding green hydrogen hubs in proximity to ports and offers funding for demonstration projects along the hydrogen value chain. In partnership with Singapore, funds were additionally allocated for developing low-emission technologies for maritime port operations, with a focus on developing regulatory testbeds and pilot projects for the use of green hydrogen and ammonia in maritime applications.

Fuel policy

Fuel policy is seen by the governments as a key tool to advance green shipping corridors, and targeted efforts to bridge shipping and energy policy are underway in at least seven Clydebank countries.

In the first half of 2023, Norway is planning to launch a national plan for making carbon neutral fuels available for shipping. Similarly, the Danish strategy for PtX and CCU includes a proposal for sustainable fuels for road

and shipping, and a nationwide mapping of port infrastructure is currently underway that looks at port readiness for the green transition.

The Belgian Government has launched a tender to support the development of hydrogen import infrastructures. In addition, since 2021, Australia has commenced several strategic partnerships with other countries (Germany, Japan, Republic of Korea, Singapore, UK and India) supporting the growth of renewable hydrogen supply chains.

Domestic stakeholder dialogue on green shipping corridors

At least seven Clydebank governments initiated or participated in stakeholder dialogue with relevant domestic stakeholders, most often with ports and shipping companies. At the same time, the countries are exploring platforms that could be used to expand this dialogue towards inclusion of other parts of the value chain.

One potentially relevant platform is the Norwegian public-private Green Shipping Program, a partnership between over 100 private organizations and 11 public observers. The program aims to advance the government's maritime plans through creating and scaling pilot projects, generating and exchanging knowledge, and facilitating stakeholder dialogue. It features strong participation from cargo owners, financial institutions and fuel producers and is, according to government representatives, highly relevant to the establishment of green corridors.

The Ministry of Transport and the Maritime Port Authority of Singapore established the Maritime International Advisory Panel to consult global business leaders from the maritime sector and adjacent industries and facilitate creation of public-private partnerships in the sector. Green shipping corridors are an area of focus for the panel.

Country-level assessments and route identification

At least six governments have chosen to undertake country-level assessments of the general conditions and potential corridor routes to enable a structured approach to selecting the routes to support and as an entry into the green corridor space.

New Zealand's Ministry of Transport has commissioned a piece of research to provide initial analysis on the conditions needed to be put in place domestically for New Zealand to establish green shipping corridors on key trade routes by 2035. In Sweden, the National Transport Authority has been assigned the role of national coordinator for green shipping corridors and tasked with investigating the conditions for and facilitating the development of green shipping corridors. So far, this has resulted in the identification of 11 corridors with high potential based on technological readiness levels, stakeholder readiness and the public mandate to enact change. Similar initiatives are currently being conducted by Ireland and Belgium. Chile has partnered with the Mærsk McKinney-Møller Center for Zero-Carbon Shipping to conduct a pre-feasibility assessment of routes involving the country. Denmark has started the process of producing a national action plan for developing green corridors from a Danish port.

International cooperation on green shipping corridors

In addition to domestic discussions with stakeholders and country-level assessments, governments are engaging in regional cooperation, and bilateral and multilateral exchanges on green corridors. These exchanges often form around or result in potential green corridor initiatives.

The United Kingdom recently announced bilateral agreements with the United States, Norway, and the Netherlands on establishing green shipping corridors. Additional bilateral efforts include agreements between the Republic of Korea and the United States, Canada and the United States, exchanges between Germany and selected partner countries, New Zealand and selected countries in the Pacific, as well as between Spain and neighboring countries.

A regional approach is particularly strong around the Baltic and North Seas, with the Nordic countries coming together to form the Nordic Green Corridors initiative. On the other side of the globe, the four members of the Quadrilateral Security Dialogue (the US, Japan, India and Australia) have agreed to form a green shipping network and have launched a Quad Shipping Task Force, tasked with establishing two to three low-emission or zero-emission shipping corridors by 2030.

Encouraging global efforts and the exchange of knowledge

Several countries see a role in encouraging global effort to advance the green corridor movement. Ahead of COP27, the United States and Norway launched the Green Shipping Challenge, urging stakeholders to come forward with commitments for decarbonizing the sector by 2050. Providing financial and technical support for green shipping corridors was mentioned as a key focus area for the challenge, which has resulted in 12 green corridor-related announcements at the time of writing.

The United Kingdom has throughout 2022 convened Clydebank Declaration signatories to exchange information and best practices on green shipping corridors. Together with the IMO, the Singapore MPA launched a call to encourage creation of route-based action plans in the Asia-Pacific region.

Germany, New Zealand and the United States are exploring different aspects of just and equitable transition in the context of green corridors. The United States has announced their support in conducting feasibility studies for corridors involving developing nations.

Several platforms are currently being used for cross-border knowledge exchange on green corridors. The members of the Zero Emission-Shipping Mission have launched a [Green Shipping Corridors Hub](#), an online platform initially containing the matchmaker tool to bring together stakeholders interested in green corridors, route tracker to communicate progress on corridor development globally, and 'library' to share the available guidance, methodologies, and good practices around corridors.

Conceptual support and guidance

At least two countries have engaged in structured efforts to provide guidance to domestic stakeholders exploring green corridors. The United States launched a Green Shipping Corridors Framework, a document containing working definitions and process steps for establishing green corridors, as well as outlining the country's general approach to supporting green corridors and

desired practices around information sharing. Similarly, Canada is developing a national framework on green shipping corridors, aiming to support emerging corridors and guiding future corridors' efforts. The framework articulates Canada's approach to supporting green corridors, defines key concepts and the roles and responsibilities of the public and private sectors. As part of the development process, the country consulted various organizations active in marine decarbonization.

Challenges for governments

The global nature of the shipping industry and cross-sector nature of shipping decarbonization pose a central challenge for national governments.

There is a lot of uncertainty surrounding the role national governments should play in advancing green corridors. Many countries face additional difficulties in articulating this role to the relevant stakeholders and state the need to maintain a highly flexible approach, since adjustments have to be made in response to the actions of the industry.

For decentralized countries such as Australia and Germany, the split of responsibilities for ports between different levels of government and the associated regulatory layers slow down the work significantly, creating a need to plan and coordinate across many levels. For many countries, the need to coordinate activities between different ministries creates an additional layer of complexity. Governments state that cooperation between Clydebank signatories can also be improved, and that difficulties coordinating activities across borders impede both the progress of the initiatives and general knowledge exchange.

A particularly challenging aspect concerns moving from conceptual support to implementation. Here, countries such as Denmark see stakeholder coordination, regulatory reforms and investment plans as the main steppingstones. Resources within government and uncertainties related to the choice of appropriate funding mechanisms are often mentioned as hurdles.

The main bottleneck for countries that are looking into initiating pre-feasibility assessments is related to the availability of appropriate tools and methods. Lack of coordination between different green corridor proponents and the perceived lack of clarity about the concept of green corridors is a related challenge.



Overall momentum

The concept of green shipping corridors has certainly captured the attention of the shipping community and is increasingly recognized as one of the key transition mechanisms for the industry. Organizations from the public and the private sector alike are contributing to sensemaking and knowledge dissemination efforts, with prominent mentions by the International Maritime Organization and the World Shipping Council, as well as all the major maritime media.

At least 14 webinars, conferences, summit sessions and side events on green shipping corridors have been held between October 2021 and 2022. Green corridors were discussed at COP26 and COP27, Global Clean Energy Action Forum, Container Shipping and Trade Webinar Week, Our Ocean Conference, World Ports Conference, Smart Freight Week and Bloomberg New Energy Finance Summit.

Most of these events aimed at familiarizing the participants with the concept of green corridors and discussing its significance, however, topics such as funding, policy, and stakeholder involvement (e.g., cargo owners, ports) were also covered. For example, the United Kingdom held a webinar discussing the available funding for green corridor feasibility studies, and Canada held a webinar regarding the national support framework for green corridors.

At least 17 reports on green corridors were or are currently being produced. The focus of the existing reports reflects the early stage of the movement, with many pieces concerned with general concept development and methodologies for different green corridor phases. Some more results-oriented studies are also available or will be released soon after the time of writing.

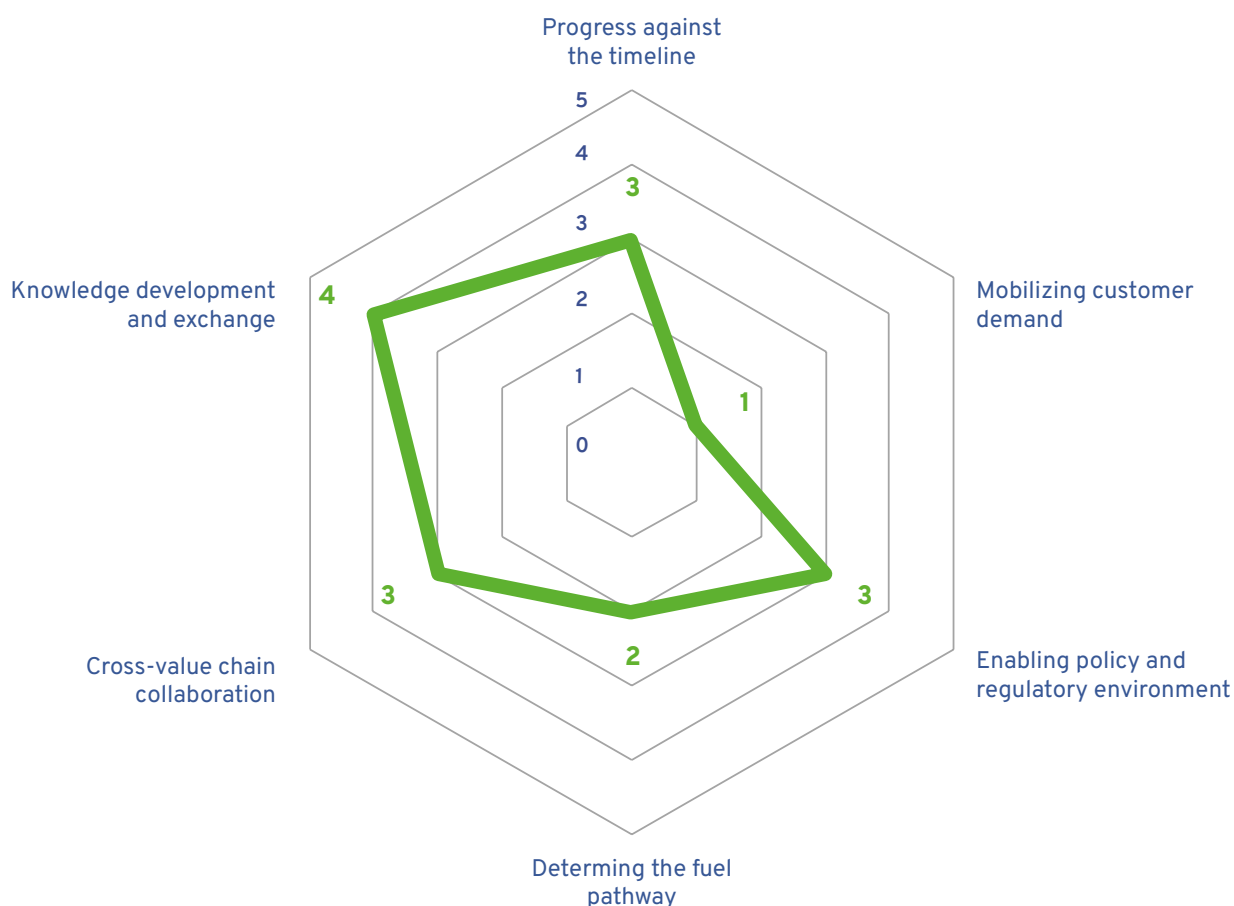
The table below features examples of published and upcoming reports. The full library can be found at the [Zero-Emission Shipping Mission Green Shipping Corridors Hub website](#).



Concept development	The Next Wave: Green Corridors (Global Maritime Forum, Energy Transitions Commission, McKinsey & Company)
	Green Corridors: Definitions and Approaches (Global Maritime Forum)
	US Green Shipping Corridor Framework (U.S. State Department)
	Green Shipping Corridors: Leveraging Synergies (American Bureau of Shipping)
Methodology for pre-feasibility assessment	The Next Wave (Global Maritime Forum, Energy Transitions Commission, McKinsey & Company)
	Upcoming: Pre-Feasibility Phase Blueprint (Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, Rocky Mountain Institute, Green Hydrogen Catapult)
	Green Shipping Corridors: Opportunity Identification (UMAS/Getting to Zero Coalition)
	First Movers in Shipping's Decarbonisation (Lloyd's Register Maritime Decarbonisation Hub)
Methodology for feasibility assessment	Green Corridors: Feasibility Phase Blueprint (Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, McKinsey & Company)
Results – pre-feasibility	The Maritime Fleet of the USA: The Current Status and Potential for the Future (UMAS/Ocean Conservancy)
	Upcoming: Chile Pre-Feasibility Assessment (Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping), European Green Corridor Network Pre-Feasibility Assessment (Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping), Nordic Council of Ministers Pre-Feasibility Study; Green Shipping Corridors: Opportunity Identification (UMAS/Getting to Zero Coalition)
Results – feasibility	Upcoming: Australia-East Asia iron ore ammonia fuel supply and demand feasibility assessment
Results – implementation plan	Upcoming: Silk Alliance implementation plan, LA-Shanghai corridor implementation plan

Overview of progress

Overall, the progress of the green corridor movement has been positive in the areas of **knowledge development and exchange**, and **enabling policy and regulatory environment**. Significant progress was also made on **advancing against the timeline** and **collaborating across the value chain**, while the areas of **mobilizing customer demand** and **determining the fuel pathway** are lagging.



Scale: 0 - no progress, 5 - robust progress

Progress against the timeline



The movement includes both large corridors with significant medium to long-term emission reduction potential and a larger than expected number of corridors, with several existing initiatives likely to generate additional green corridors in the near future. However, there remain significant concerns over how far these initiatives have progressed through the green corridor development stages, with only a handful of corridors making their way into the feasibility assessment stage. This may indicate a need for more exchange on the challenges facing the initiatives. On the other hand, progress may accelerate as the scope of the initiatives crystallizes and the movement generally enters a more mature stage.

Mobilizing customer demand



Mobilizing customer demand represents the area where the least amount of progress was made. The involvement of cargo owners is key to the long-term feasibility and economic success of green corridors, since policy measures alone are unlikely to fully bridge the price gap between zero-emission and conventional fuels. At the same time, as pointed out by the initiatives, building relationships and trust among green corridor partners is a key first step in ensuring long-term success of the initiatives. Not including cargo owners in these crucial first discussions may lead to a significant bottleneck further down the line. Several challenges will have to be addressed to bring cargo owners aboard, including a mismatch between the timeline of the movement and the cargo owners' desire for quick emission reductions.

Enabling policy and regulatory environment



First mover countries have made significant progress in advancing the national policy agenda in support of green corridors. A plethora of policy measures have been implemented or are currently being discussed, and countries seem to be taking a flexible, context-specific approach to finding the most fitting ways to support green corridors. However, most of countries remain in the searching phase, and signs of an emerging disconnect between the types of policy support requested by the initiatives and the policies offered by the governments can already be seen. This is particularly evident in the area of fuel policy, where initiatives are likely to seek support to manage the very substantial OPEX increase associated with using zero-emission fuels, while most of the R&D and other funding mechanisms available only cover capital expenses. This creates the risk of policy becoming a bottleneck as the initiatives move closer to the implementation.

In addition, there is a risk that future funding and R&D policies will not sufficiently encourage cross-value chain collaboration but perpetuate existing silos. The passive/reactive approach some governments take in selecting the corridors for support also reflects a gap.

Determining the fuel pathway



Most of the options for zero-emission fuels are captured by the movement. However, fuel decisions are being pushed into the future, with many corridors wanting to remain flexible for as long as possible and not enough fuel providers involved.

The portfolio of green corridor initiatives will most likely feature both initiatives with a pre-determined fuel pathway and initiatives covering a portfolio of fuel options. Both these strategies may be valid: a multi-fuel strategy helps hedge against the risks associated with relying on one type of technology, especially for large routes, while single-fuel corridors can deliver a more concerted effort and potentially move faster. However, at present, unspecified fuel pathways appear to reflect uncertainty and indecision at least as much as strategy, and decisions may need to be taken soon for initiatives to stay on course.

Cross-value chain collaboration



The green corridor movement has engaged a variety of stakeholder types, with good representation from both the private and the public sector. However, participation is currently too limited to traditional shipping actors such as shipping companies, ports and classification societies, whereas stakeholders such as fuel producers, cargo owners, and the financial institutions are underrepresented.

One key element that distinguishes green shipping corridors from other demonstration and pilot projects within the sector is related to establishing innovative value chains. Zero-emission fuels require both rethinking of the relationships between actors within the traditional shipping value chain and new relationships with actors outside of that value chain.

Knowledge development and exchange



To ensure that the movement reaches its goals, there is a need to increase the general level of knowledge around the concept of green shipping corridors, exchange knowledge and best practices between the initiatives, and share relevant information within the initiatives. In terms of the overall knowledge about the concept, the growing momentum and a relatively large number of reports, events and high-level mentions are positive indicators. The flipside, however, is the presence of multiple different definitions and approaches advocated by proponents of green shipping corridors, which has made scoping initiatives more challenging in some cases.

Several mechanisms are shaping up to facilitate the exchange between the initiatives, such as the emergence of network-based initiatives, bilateral and multilateral exchanges between countries, and online platforms, though some initiatives and countries expressed the need for more action in this area.

As pointed out in the Challenges section, the exchange of information within initiatives often represents a bottleneck for their progress. In this regard, the role of national governments could be strengthened to include provision of a framework for data sharing for green corridors.



Recommendations

and next steps

The report demonstrates that the level of activity during the first year of the green corridor movement has exceeded expectations, but also identifies potential areas for improvement.

The recommendations below seek to address emerging weaknesses of the movement while building on its strengths. Future versions of this report will place more emphasis on these areas by including more performance-based and normative indicators.

Involving key stakeholders early in the process

Addressed progress areas: Progress against the timeline, Cross-value chain collaboration, Mobilizing customer demand, Determining the fuel pathway

Active participation of cargo owners, preferably through direct involvement in the initiatives, is particularly crucial going forward. Indirect engagement through the existing networks marks a good first step to both familiarize cargo owners with the concept and create the necessary sense of security. In the long run, deep engagement from these stakeholders will be needed if the cost gap is to be bridged.

Ensuring participation by key stakeholders requires establishing mechanisms to facilitate pre-commercial engagement by actors across the value chain, developing appropriate risk-sharing mechanisms, and taking a strategic view on the prioritization of green corridors (more on this below). All of these are areas where governments can have an impact. In the long run, new or redesigned cross-sector funding programs that place collaboration across the value chain at the center of efforts may be advisable. In the short term, considering specific provisions for inclusion of the whole value chain when seeking funding is a good option.

The stakeholder complexity resulting from broad involvement of actors in initiatives must also be managed. One way that is currently being explored by the corridors is through introducing different tiers of participation, with a smaller core group and a bigger advisory group, each with different roles and responsibilities.

Using national policy support to close the fuel cost gap for zero-emission shipping

Addressed progress areas: Progress against the timeline, Enabling policy and regulation, Determining the fuel pathway, Mobilizing customer demand

Due to the geographic scope of green corridors, national governments will need to play a bigger role in their development than they may be used to in a shipping context. With more corridors moving to build out their economic feasibility, the pressure on countries to provide support for the increased OPEX

costs associated with deploying zero-emission fuels will grow. Ambitious countries should explore contracts for difference or other forms of subsidies targeting the fuel cost gap, for instance through earmarking some of the wider revenue being put into the energy transition for fuels used by the shipping sector. Direct participation from national governments in developing green corridors' implementation plans can help calibrate the structure and timing of this support to the needs of the corridors.

Thinking more critically about the prioritization of corridors

Addressed progress areas: Progress against the timeline, Determining the fuel pathway, Enabling policy and regulation

So far and in the absence of guidance and support, the location of green corridors has to a significant extent been decided based on bottom-up initiative. While this has helped the movement gain a critical mass, moving to a more robust approach to deciding which routes to focus on might be preferable going forward. University Maritime Advisory Services (UMAS) and the Getting to Zero Coalition recently published a paper illustrating how such prioritization could be undertaken by the Clydebank signatories, and UMAS has made available an initial data set to support such prioritization.

Striving for specificity on fuel pathways where possible

Addressed progress areas: Progress against the timeline, Determining the fuel pathway

One of the main advantages of tackling decarbonization within the context of a green corridor is to help simplify complex choices and overcome uncertainties, including those related to fuel pathways. The large share of corridors that are either undecided on their fuel pathway or that have chosen to consider several fuels creates a risk of delay and diluting efforts at the global portfolio level, with none of the fuels and technologies gaining the necessary scale, resources, and support to advance towards rapid diffusion. Striving for specificity on a fuel pathway, where possible, is recommended, through a combination of public and private efforts connecting the corridors to emerging zero-emission energy supplies.

Focusing on learning by doing

Addressed progress areas: Progress against the timeline, Knowledge development and exchange

Support frameworks for different aspects of green corridor development are both in high demand and growing in number. In practice, many aspects of green corridor development are too context-specific to be able to fully rely on standardized methodologies and guidelines. For the initiatives at the more advanced stages of development, many challenges can be traced to the specificities of the segments involved, geographies included, and sometimes all the way down to the individual organizations participating in the corridor. Against this background, being prepared to lean more towards learning by doing and not overly rely on a standardized path is a potential area for improvement. Sharing best practices and discussing challenges is a good way to make sure the initiatives gain the necessary confidence and knowledge to progress towards implementation, while tailoring their approach to their unique situation.

Focusing on the technology transition to 2030

Addressed progress areas: Progress against the timeline, Cross-value chain collaboration

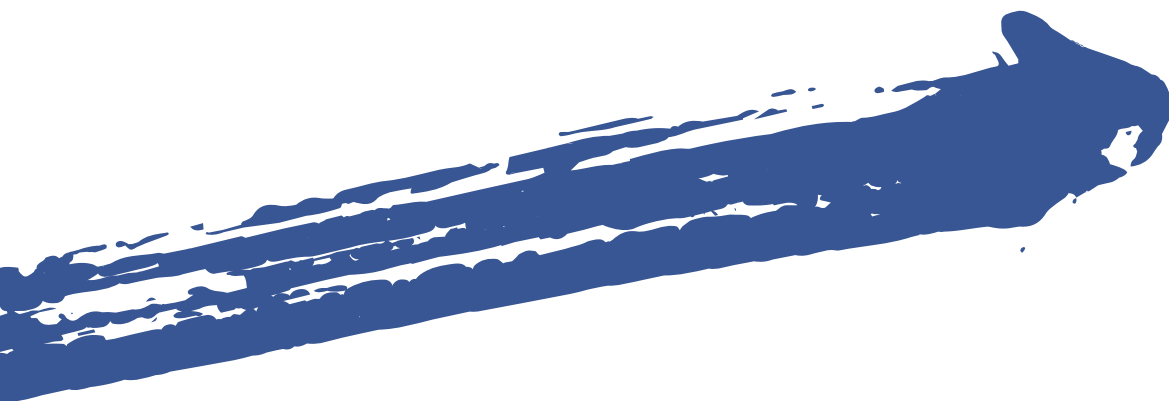
While emissions reduction is the end goal of shipping decarbonization, the logic of the green corridors and the 5%-by-2030 goal is primarily concerned with helping the industry reach a tipping point in technology development and deployment that will allow it to enter a period of rapid diffusion of zero-emission technologies after 2030. In the context of green corridors and within the timeframe of the movement, emissions reduction is a result rather than the main objective.

One-sided focus on emission reduction by 2030 will lead to the prioritization of low-hanging fruit and will not deliver the technologies needed for the broader transition. While setting goals that stretch beyond 2030 and cover emissions reduction potential are important for both making the economic case and attracting the relevant stakeholder groups, considering technology- and infrastructure-oriented indicators with 2030 as the timeframe is recommended. Examples of such indicators include number of vessels, amount of fuel, and the intermediate milestones related to the readiness level of the underlying infrastructure and technology.

Exploring mechanisms for green corridors' contribution to equitable transition

Addressed progress areas: Knowledge development and exchange

There are several emerging efforts to expand the geographic representativeness of the green corridor movement and increase the participation of developing countries. In this context, a discussion needs to be held on the most effective ways equitable transition considerations are incorporated. One way to do so would be by leveraging the existing international knowledge transfer and technical cooperation mechanisms. Making both the technologies and knowledge available across geographies ahead of entering the global diffusion phase will contribute to making the transition truly global and just.





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