


3G. Green corridor project baselining

Methodology – steps		Inputs
01	Describe the project's vision, goals, and requirements in detail to identify the desired target state .	Feasibility Scoping [Methodology 1A]
02	Identify sources of alternative fuel best suited to meet future demand, considering import options, announced projects, etc	What are the potential alternative fuels and sources best suited for the corridor?
03	Assess the current and expected storage and bunkering infrastructure for the corridor (based on geography, fuels, segment, volume, etc.)	Which are the key ports and what are their respective bunkering & storage infrastructure ?
04	Understand the administrative scheme in place within the green corridor	Which tax and tax exemptions are applicable? What are the laws and who are the relevant authorities for handling/bunkering?
05	Specify the technical characteristics of vessels in the corridor (incl. types, sizes, ages, fuel consumption, voyage characteristics)	What are the key technical characteristics of the vessels expected in the green corridor?
06	Describe the high-level trade flows, incl. type (cargo types), nature (e.g., origin-destination), ownership , etc.	What is the nature of the trade flows and the end-customer characteristics related to the corridor?
07	Estimate the CO₂ abatement potential and cost gap to be closed . Define the target state and compare with a fossil-based 'current state'	Feasibility Scoping [Methodology 2F]
08	Summarize key insights into a corridor project baseline that can serve as the starting point for the Feasibility assessment (max 10 pages)	



A. Describe the vision, goals, and requirements of the Feasibility Study

Methodology – steps	Inputs
<div>i</div> Describe the desired target state in a foundational narrative	<ul style="list-style-type: none">– Conversations with key project stakeholders– Output from Pre-Feasibility Study
<div>ii</div> Create a Scoping factsheet with key data on fuel, port, bunkering, and storage, as well as regulatory factors, and update it as more insight is acquired	<ul style="list-style-type: none">– Conversations with key project stakeholders
<div>iii</div> Describe the project’s vision, goals, and requirements as precisely as possible	<ul style="list-style-type: none">– Combination of the above

 Refer to project vision, goals, requirements, and narrative guideline



Illustrative examples

A. Project Vision

1 Vision and context

What is the overall vision and what recent developments does the project play into?

2 Goals and value streams related to the vision

How does this project contribute to realizing the overall vision?

3 Just & Equitable

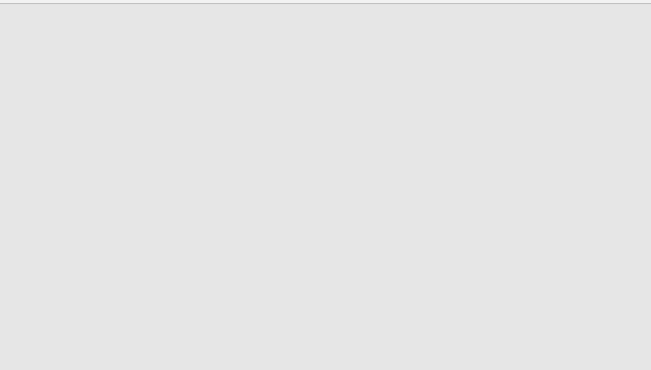
How can the outcomes of the project be a positive driver for a Just & Equitable green transition?

4

Include relevant data points, if available, to support the overall vision, to make it more tangible

Page 10

A.i



A.ii

C. Project vision, goals, and requirements - Template

Project vision

Project goals

Project requirements

Questions to define the project vision, goals, and requirements:

1 What is the overarching vision that the project is contributing to?

2 What are the project's desired outcomes?

3 What requirements and procedures need to be followed?

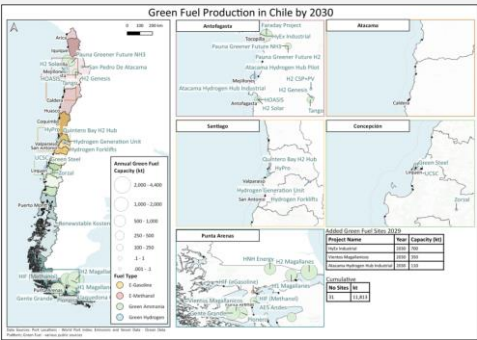
Page 11

A.iii

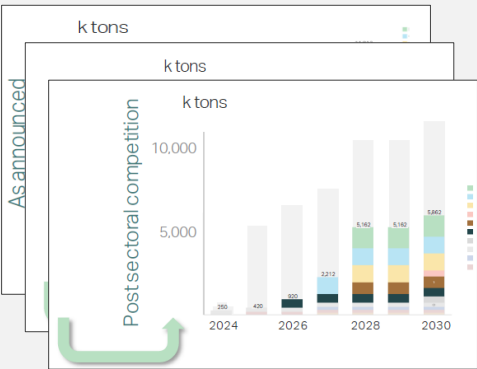
B. Identify sources of alternative fuel best suited to meet future demand

Methodology – steps	Inputs
<div>i</div> Fuel demand of decided alternative fuel(s): Create high-level estimate for future demand for alternative fuel(s) over time for the specific corridor	<div><div>–</div>Expected fuel consumption for vessels operating on specific corridor</div> <div><div>–</div>Distance of corridor</div> <div><div>–</div>Days at sea / days at port</div>

Illustrative examples



B.ii



B.iii



B.IV⁽⁷⁾

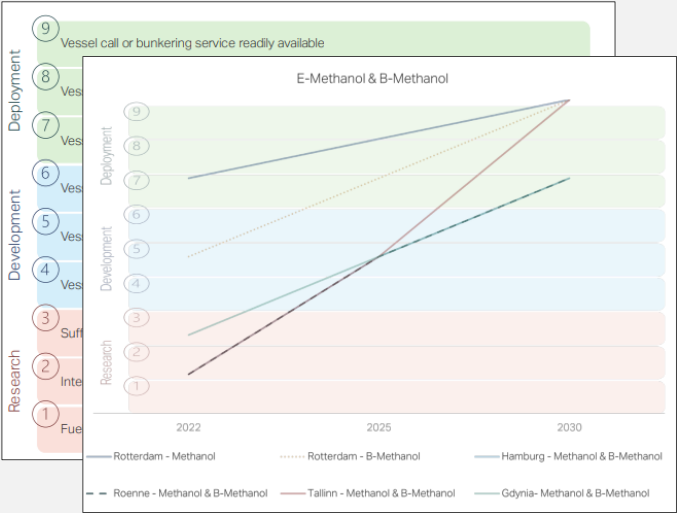


7: Inspired from: GMF_WA-East-Asia-Iron-Ore-Green-Corridor-Feasibility-Study.pdf (globalmaritimeforum.org)

C. Assess the current and expected storage and bunkering infrastructure along the corridor

Methodology – steps	Inputs
i Describe port ownership and operatorship structures relevant for the specific green corridor. Describe geographical conditions for relevant ports (weather, depth, etc.) as well as limitations (to expansion or fuel handling)	<ul style="list-style-type: none">Ownership structure (e.g., state-owned, private)Port operatorsExisting agreements between operator/ownerGeography of portsDescription of possible limitations to expansion (e.g., protected land)
ii Identify current storage, loading/unloading & bunkering options for ports along the specific corridor	<ul style="list-style-type: none">Bunkering operatorsAssessment of fuels and chemical handled in the portDescription of onshore and marine bunkering/storage infrastructure by fuel type (fuel oil, bio-oil, LNG)Chemical types handled (especially NH₃, CH₃OH, CO₂, H₂)Description of current and expected capacity
iii Create overview of quantitative / qualitative port readiness level assessment along with planned future investments in facilities and other future plans for relevant ports along the specific corridor	<ul style="list-style-type: none">Quantitative port readiness level assessment based on WPCAP guideline and/or qualitative port assessment to determine port readinessDescription of strategies and any planned additions to infrastructure
iv Estimate high-level CapEx and OpEx for the selected ports to establish and operate the infrastructure (storage & bunkering) for the alternative fuel	<ul style="list-style-type: none">Input from literature and/or announcementPossibly Input/QC'ed by Scoping Project members

Illustrative examples



D. Understand the administrative scheme in place within the green corridor

The administrative scheme within the green corridor encompasses several key aspects, including taxation/exemptions and handling/bunkering permissions.

Methodology – steps

Determine the taxation status of alternative fuels versus fossil fuels, and whether taxation applies to fuel consumption during **domestic navigation** versus international navigation (tax exempted).

Understand **handling and bunkering permissions**. This will involve inquiries into **applicable laws** and jurisdictions, identification of **authorities** responsible for overseeing the use of new fuels (such as but not limited to: port authorities, operators, coast guards, or ministries).

Find out whether land-based facilities fall under the purview of the same agencies.

These considerations are vital for navigating the **regulatory landscape** and **ensuring compliance** within the green corridor.

1350

STATE OF SOUTH CAROLINA
DEPARTMENT OF REVENUE
EXEMPTION CERTIFICATE
FOR SALES AND USE TAX
(Single Sale Only)

ST-8
(Rev. 7/14/16)
5009

Purchaser's Name

Date

Signature

Signature

Amount of Sale \$

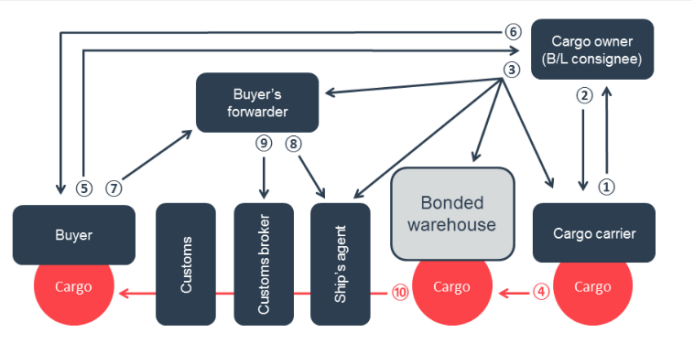
Address

This form is to be completed by purchaser and seller must maintain copy of exemption certificate. Do not send certificate to SC Department of Revenue.

The undersigned hereby certifies that the purchases of tangible personal property made under this certificate are made in accordance with the exemption checked below; that in the event the property so purchased is used for purposes other than specified, the purchaser assumes full liability and must file a return and pay the tax due thereon.

Description of tangible personal property purchased

Illustrative example of exemption certificate



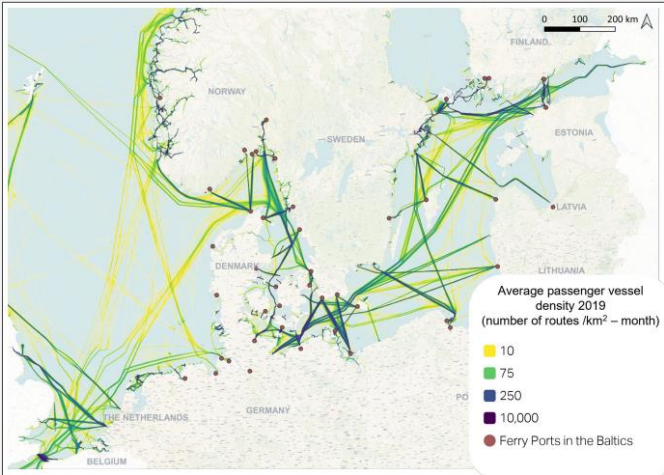
Illustrative example of trade and forfeiting flow



E. Specify the technical characteristics of vessels in the corridor

Methodology – steps	Inputs
i Describe current vessel routing behavior on the corridor. Estimate future changes (if any)	– Schedules, number of trips, etc.
ii Create overview of owner(s) and operator(s) of vessels active on the specific corridor	– Literature/Internet search
iii Develop overview of number and type of vessels operating on the specific corridor. Estimate development scenario of specific corridor to fully decarbonize	– Number of vessels by size (e.g., handysize, capesize) – Number of vessels by age (e.g., newbuild, 10+ years) – Expected vessel newbuilds (order book)
iv Identify technical profile of vessels 1) currently active on specific corridor and 2) to be active on alternative fuel	– Propulsion technologies, engine systems for current and future vessels
v Estimate annual fuel consumption on green corridor based on high-level assessment of annual fuel consumption for vessels on specific corridor	– Number of ships along corridor by size – Preferred fuel type – Average fuel consumption by size
vi Calculate corridor emissions per vessel/cargo unit for vessels 1) currently active on specific corridor and 2) to be active on alternative fuel	– Vessel annual fuel consumption – Emissions factor to convert fuel to resulting emissions
vii Estimate high-level CapEx and OpEx for the specific number of vessels in both a fossil and alternative version	– Input from literature and/or announcement – Possibly Input/QC'ed by Scoping Project members

Illustrative examples



D.iii



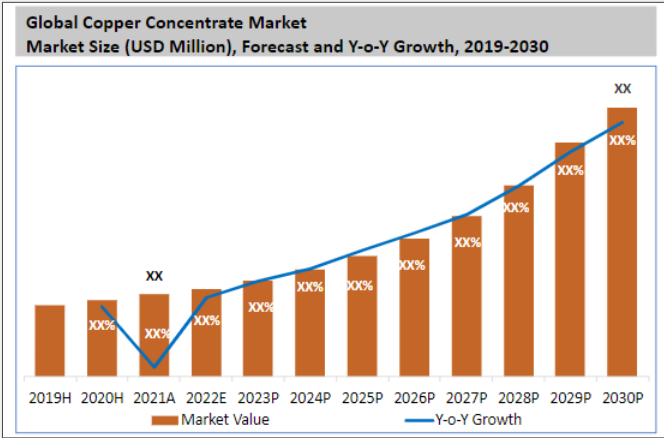
F. Describe the high-level trade flows, including type, nature and ownership

Methodology – steps	Inputs
<div>i</div> Describe the nature of the cargo to be transported on the specific corridor (origin-destination)	<ul style="list-style-type: none"> Trade type and volumes (import/export) Origin-destination vs. trans-shipment
<div>ii</div> Map the current and projected cargo trade flows and growth (volume/value) for the cargo type of the specific corridor	<ul style="list-style-type: none"> Types of goods for each vessel segment (e.g., commodities, passengers, consumer) Current and projected trade volume (DWT/TEU⁸) of commodities/products Current and projected trade value of commodities/ products
<div>iii</div> Map key stakeholders related to the cargo	<ul style="list-style-type: none"> Beneficial cargo owners and intermediaries (freights forwarders, third parties, etc.)
<div>iv</div> Estimate the high-level value of the cargo type for the corridor, based on a number of years, to estimate value increase/decrease and/or interruptions. Assess based on studies, literature, and questionnaires what the possible willingness-to-pay is for the cargo type	<ul style="list-style-type: none"> Market reports, commodity index Studies, literature

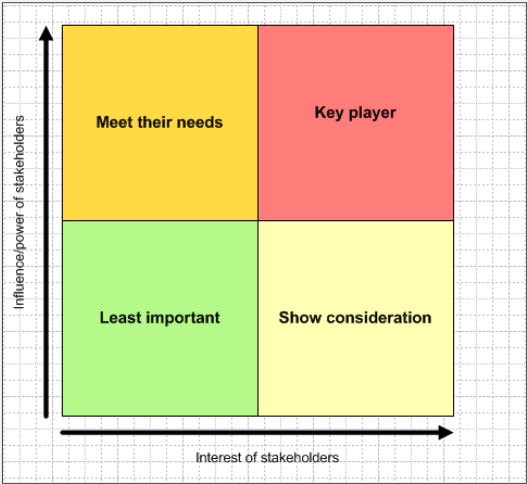


8: Deadweight tonnage and 20-foot equivalent unit

Illustrative examples



E.i



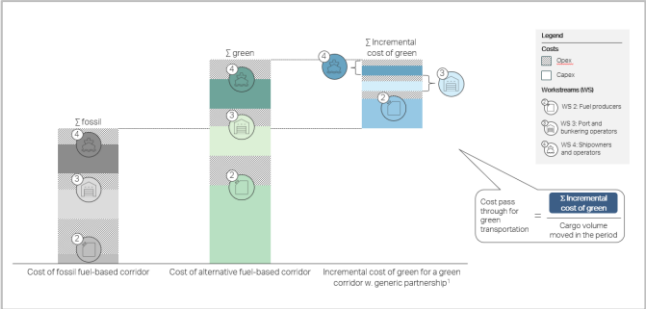
E.iii

G. Estimate the green corridor's CO₂ abatement potential and cost gap to be closed

Methodology – steps	Inputs
i Assess the total cost (CapEx + OpEx) of the specific corridor on traditional fossil fuel and on the proposed alternative fuel based on insights from each value chain element	<ul style="list-style-type: none"> – 1.2.D, E output – 1.4.G output – Green Corridor Scenario Modeling tool
ii Estimate the incremental cost of green for each of the value chain elements as well as the total incremental cost of green	<ul style="list-style-type: none"> – 1.2.D, E output – 1.4.G output – Green Corridor Scenario Modeling tool
iii Identify the CO₂ abatement potential and incremental cost of green per cargo unit and compare to total cargo value	<ul style="list-style-type: none"> – The above and 1.4 output – Green Corridor Scenario Modeling tool
iv Make ‘inverse calculation’ to estimate 1) the needed pricing on CO₂ to break even 2) the incremental cost per cargo unit	<ul style="list-style-type: none"> – Combination of above – Green Corridor Scenario Modeling tool



Illustrative examples



F.i-iii

H. Summarize key insights into a corridor baseline document

1	Description of the target state — including vision, goals, and requirements for the green corridor — conceptual drawing of scope and workstream delineation
2	Recommendation of the alternative fuel to be used in the green corridor, including its required volume, if possible, its source / feedstock and its production location
3	Description of current port, storage and bunkering infrastructure along the green corridor, including current capacity, as well as the future target port, storage and bunkering infrastructure , including necessary capacity
4	Overview of the administrative scheme in place within the green corridor
5	Overview of current and expected low/zero carbon emission vessels in the corridor, including their specific characteristics and emissions
6	Understanding of trade flows, cargo type, volume and value, cargo owners and consumers
7	Potential CO ₂ abatement, initial total cost estimate (CapEx and OpEx over 25 years) as well as an initial view on the incremental cost of green



Suggested structure of the chapter in the final report



1. Introduction and project framework, incl. project vision, goals, and requirements, an initial view on key findings and the incremental cost gap
2. Alternative fuels supply chain
 - A. General overview
 - B. Specific to the project
 - C. Preliminary cost assessment
3. Port and bunkering infrastructure
 - A. General overview
 - B. Specific to the project
 - C. Preliminary cost assessment
4. Overview of administrative scheme
5. Low/zero emission vessels
 - A. General overview
 - B. Specific to the project
 - C. Preliminary cost assessment
6. Cargo demand dynamics
7. Summary
 - A. CO₂ abatement potential
 - B. Incremental cost
 - C. Next steps