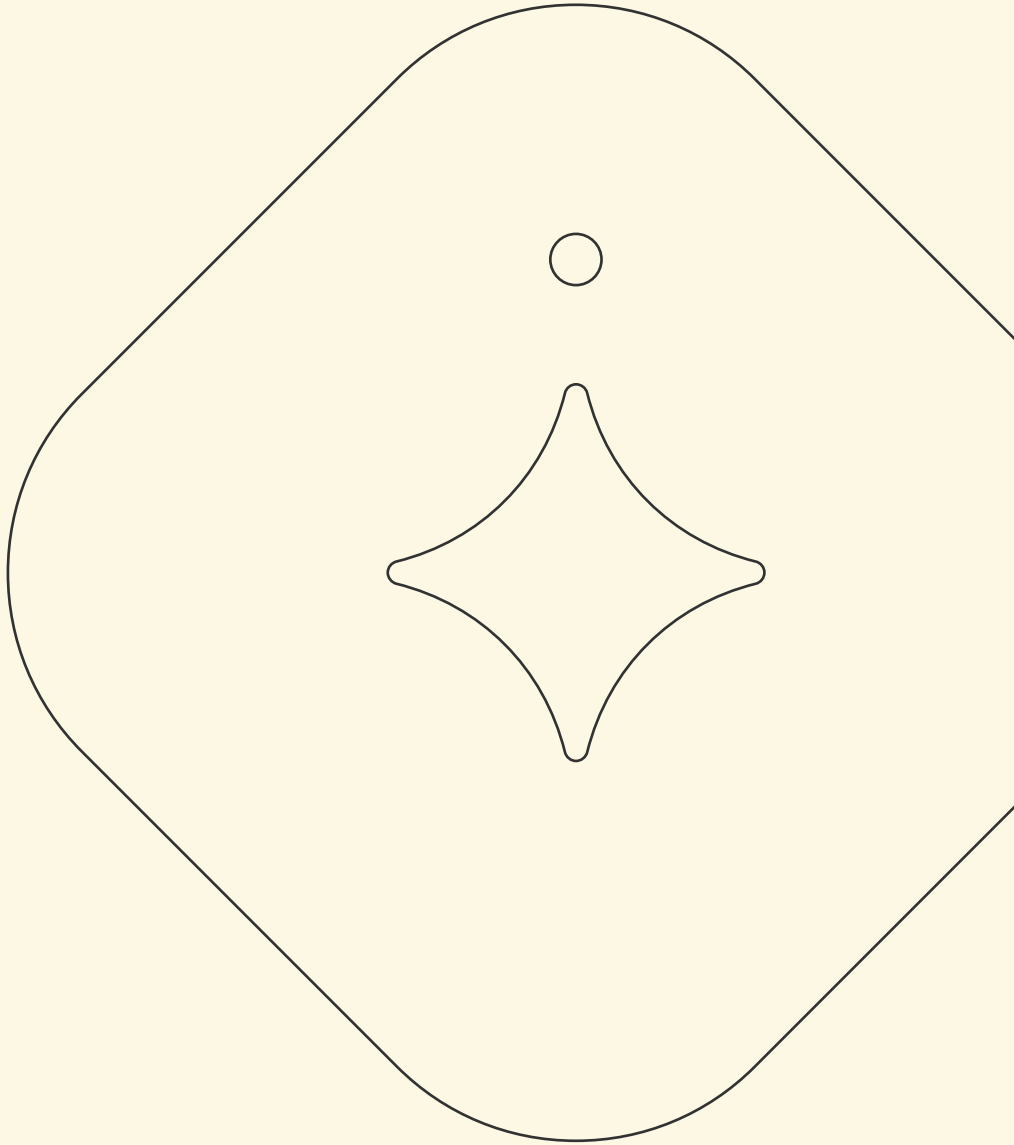
METHODOLOGY

Green Corridors
Pre-Feasibility Scoping Phase



Mærsk Mc-Kinney Møller Center
for Zero Carbon Shipping

RMI
ENERGY. TRANSFORMED.

GREEN
HYDROGEN
CATAPULT

Expected outcomes of Pre-Feasibility Scoping phase

To launch a green corridor project successfully, it is crucial to follow the initial steps of establishing a consortium and defining the project scope.

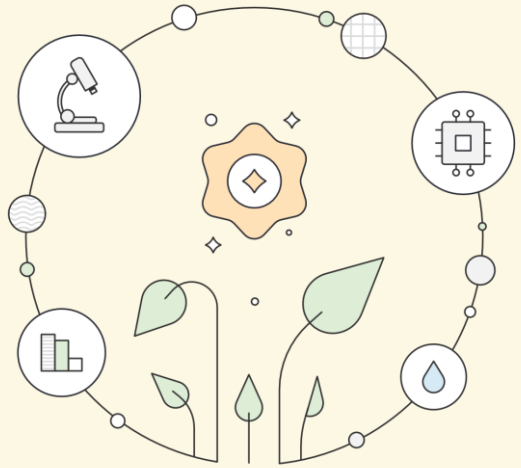
This includes defining clear project goals to create a shared understanding of the overall objectives. Once the goals are in place, roles within the consortium are assigned to ensure a structured and collaborative approach.

Concurrently, a robust project governance structure is established to effectively manage various aspects of the upcoming project (feasibility study).

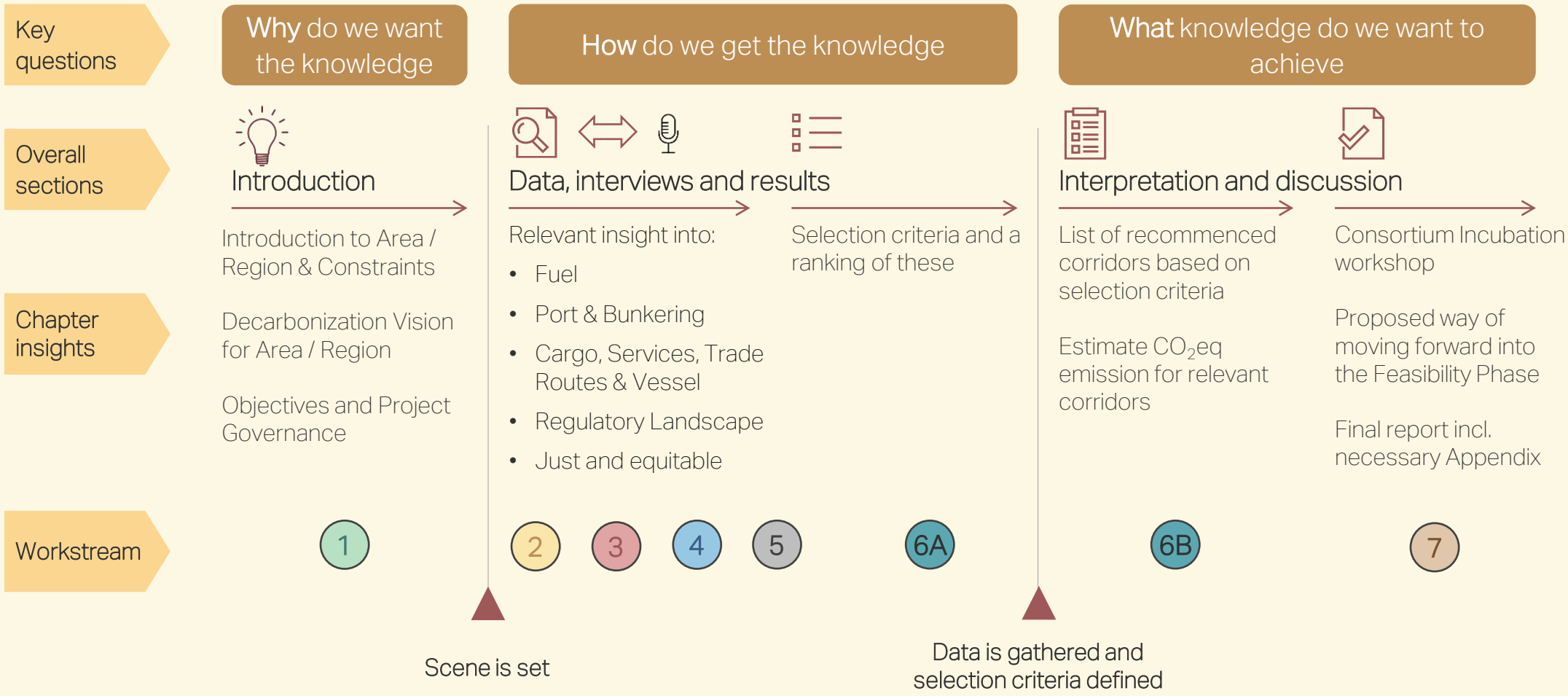
The scope of work is then clearly outlined, with the flexibility to customize the approach, if necessary, thereby facilitating and streamlining the entire process.

Optionally, the formalization of consortium formation can be finalized through the issuance of a Letter of Intent (LOI), outlining the terms, conditions, and responsibilities of each party involved in the next step — the Pre-Feasibility Study.

These comprehensive steps not only establish a strong foundation but also enable the project team to seamlessly prepare for the pre-feasibility study phase.



Methodology for Center's Pre-Feasibility phase

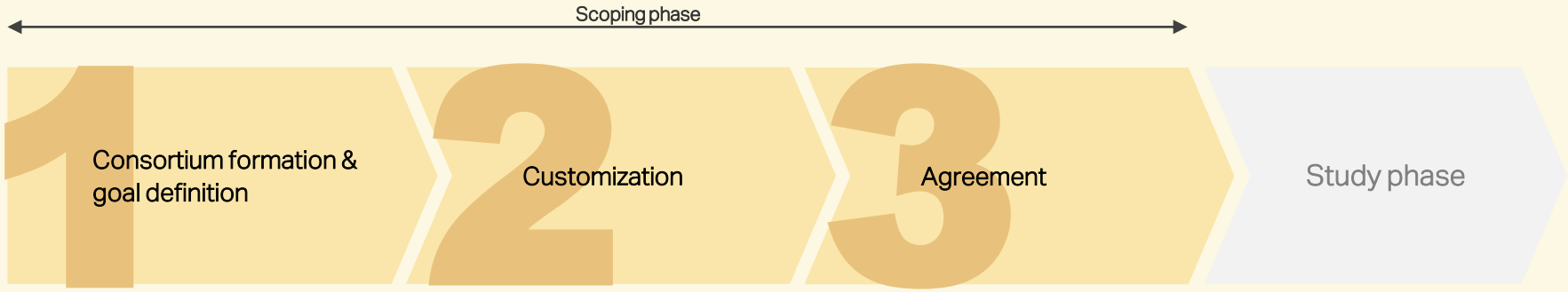


The Pre-Feasibility Scoping phase in detail

This phase consists of three main stages. In this document, all main stages are explained step by step.

Overview of the different Pre-Feasibility scoping stages:

Serves as a point of reference throughout the document and guides the sequencing of activities



Key activities in each of the stages and their related analyses and guidelines:

Provides an overview of the methodology and select illustrative examples

- **A** Consortium formation, incl. assignment of roles and project governance
- **B** Project vision, goals, and requirements
- **C** Work scope definition
- **D** Data collection principles
- **E** Project plan
- **F** Letter of Intent (LOI)

1 Consortium formation & goal definition

A Consortium formation (incl. assignment of roles and project governance)

B Project vision, goals, and requirements

2 Customization

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1A. Consortium formation (incl. assignment of roles and project governance)

Purpose

- Form a **project team** (=**consortium**) to drive the upcoming Pre-Feasibility Study.
- Identify and engage **potential consortium members**, and align on their **roles,** level of **involvement** and overarching project governance.
- **Instill accountability** for the workstreams when conducting the Pre-Feasibility Study.

Key questions

- **Who** are the **critical stakeholders** who can ensure that the work during the pre-feasibility study is conducted and how will they work together?
- **Where** are the **gaps** in the consortium and which stakeholder might be able to **close** these gaps?

Importance

- Forming a consortium benefits a Pre-Feasibility Study immensely, as it **secures the resources and expertise** required to drive the Pre-Feasibility Study.
- Clarifying and agreeing on roles and project governance is necessary to **ensure a smooth execution** of the Pre-Feasibility Study.

The consortium formation

Core consortium identified

Create an initial core team for the project.

This typically includes a smaller subset of stakeholders from the Value Chain and/or public decision makers and stakeholders.

Agreement on roles

Agree on roles for consortium members (Workstream Lead, Workstream Support, Sounding Board) for the upcoming Pre-Feasibility Study phase based on their commitment level, interest and expertise.

Consortium Gap Analysis

Identify workstream gaps (if any) in the consortium using the role assignment template.

Select additional potential consortium members in a step-wise process based on commitment level, interest and expertise, and align with the core team on the selection of additional consortium members.

Final consortium

Finalize consortium committed to moving into Pre-Feasibility Study phase.

Letter of Intent (optional)

Continuously adjust consortium as more insights are generated and goals & narrative evolve (the core consortium can already start with activities in the Scoping Phase before the consortium has been finalized).

Adjustment ends when there are **no more gaps** identified.

Suggested roles of consortium stakeholders in Study phase

Role	Responsibilities	Resources required (hours)[1]
Project lead (Workstream 1)	• **Lead, plan, and coordinate** the project • **Provide guidance** on processes/frameworks/methods/templates to ensure consistency and quality across workstreams	200-500
Workstream Lead for Workstreams 2-5	• **Take responsibility** for a workstream, including coordination of workstream resources and activities • **Liaise with Project Lead** to align on deliverables and **define the desired outcomes** • **Lead and oversee the workstream analysis** with respective workstream members in accordance with defined scope, processes, and methods • **Gather, share, and analyze valuable information and data** to assess the technical and regulatory feasibility, costs, socio-economic opportunities, and risks, and **summarize results in a report**	100-300
Workstream Lead for Workstream 6	• Leverage findings from the Pre-Feasibility Study and collect input from Workstreams 2-5 to **generate a first suite of recommended green corridors** • **Drive the corridor selection process** with a holistic view of the ecosystem **without commercial interest into the development area**	100-300
Workstream Lead for Workstream 7	• **Liaise with Project Lead** to drive the **1st Suite of corridors** to the **Consortium Incubation Workshop**, and make a shorter list of 1st wave corridors. • **Consolidate findings** from the Pre-Feasibility assessment into a **final report** • **Propose a way forward** to move the 1st Wave corridors into the next phase	100-300
Workstream Support (Optional)	• **Support the Workstream Leads in gathering and analyzing valuable information and data** in their respective workstreams, and in **summarizing results in a report** • Align with the Workstream Lead on required analyses and desired outcomes	50-100
Sounding Board (optional)	• **Provide feedback and input** throughout the project	10-30

1. For the entire pre-feasibility study

Suggested roles of consortium stakeholders

- The workstream **lead of Workstream 1**:
  - is **automatically** the **overall project lead**
  - is **often** the **lead of Workstream 7**
- The **resources** (hours) **required may vary** depending on the **scope of work**
- **Examples of potential stakeholders:**
  - Governmental institutions (e.g. ministries)
  - Non-profit organizations (e.g. environmental advocacy groups or port workers unions / seafarer unions)
  - Fuel producers
  - Trading companies
  - Port and bunkering operators
  - Shipowners and operators
  - Logistics companies
  - Cargo owners
  - Investors
  - Consulting services companies
- Use the **role assignment template** to **indicate all stakeholders** (and their contact details) across the workstreams

Thoughts:

- The need for **Workstream support** is **decided upon by the Workstreams Leads**
- **Suggestion is to include** at least one representative from an **environmental or social NGO** to provide a **perspective without a commercial interest** where possible
- **Suggestion is to include** at least one **regional representative** where relevant

Template: Role assignment

TEMPLATE

	1	2	3	4	5	6	7
Workstreams	Introduction, vision and project setup	Alternative fuels	Port, storage, and bunkering infrastructure	Trade routes, vessels, cargo and services	Policy, regulation, Just & equitable	Selecting 1st Suite of corridors	Generating 1st Wave corridors and issuing final report
Stakeholders	All stakeholders	Fuel producers	Port and bunkering operators	Shipowners and operators	All stakeholders, incl. regulators	All stakeholders	All stakeholders
Workstream Lead	[Firstname Last name] [E-mail] [Company logo]						
Workstream Support	[Firstname Last name] [E-mail] [Company logo]		Add all involved stakeholders' details here				
Sounding Board	[Firstname Last name] [E-mail] [Company logo]						

Example role assignment: AU-NZ project includes 16 project members

EXAMPLE

	1	2	3	4	5	6	7
Workstreams	Introduction, vision and project setup	Alternative fuels	Port, storage, and bunkering infrastructure	Trade routes, vessels, cargo and services	Policy, regulation, justice and equitability	Selecting 1st Suite of corridors	Generating 1st Wave corridors and issuing final report
Stakeholders	All stakeholders	Fuel producers	Port and bunkering operators	Shipowners and operators	All stakeholders, incl. regulators	All stakeholders	All stakeholders
Workstream Lead	✦	Sumitomo Corporation	SVITZER	John Swire & Sons	Queensland Government; NSW Government; Victoria Australia	Queensland Government; NSW Government; Victoria Australia	✦
Workstream Support	Queensland Government	Woodside Energy; Mitsubishi Heavy Industries, Ltd.	Woodside Energy; John Swire & Sons; DP World	RioTinto	Queensland Government; Te Kāwanatanga o Aotearoa New Zealand Government; NSW Government; Victoria Australia	✦; Te Kāwanatanga o Aotearoa New Zealand Government	Queensland Government; Te Kāwanatanga o Aotearoa New Zealand Government; NSW Government; Victoria Australia

Sounding Board: CSIRO; NTRO; Mitsui & Co.; Australian Government; Ministry of Foreign Affairs of Denmark, Denmark in Australia

✦

1 Consortium formation & goal definition

A Consortium formation (incl. assignment of roles and project governance)

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1B. Project vision, goals and requirements

Purpose

- Provide a **sense of direction** to the project team and create a shared understanding of **what** the project **aims to achieve** in the Pre-Feasibility phase.
- Serve as a **basis for measuring progress** and **evaluating the success** of the project.
- Describe the project's vision, goals requirements and narrative in detail to **identify the desired target.**
- **Offer input and guidance** for the entire Pre-Feasibility project.

Key questions

- What are the **vision, goals and requirements** for the upcoming pre-feasibility study of the specific corridors?
- Which are the important **focus areas** for the upcoming phases?
- What are the **desired outcomes**?
- Which **results** are key to proceeding to the next step?
- **How** do green corridors **support** the areas' overall social, ecological or economical goals and ambitions described in the **vision**?

Importance

- Establishment of a **clear** project vision, goals, and requirements for the Pre-Feasibility Study that will guide the formation of the consortium based on **agreed-upon goals and vision**.
- Development of a narrative garners **support** from consortium members as well as senior decision makers.
- Ensures the **alignment of stakeholders** on the project's objectives. This alignment is **vital** for the **success** of green corridor projects.

Project vision, goals, and requirements

Each project requires a foundational narrative to be developed and synthesized into a project vision, specific goals, and project requirements

A Foundational narrative

Purpose Puts the project's vision and goals into perspective and explains the reasoning behind them

⇨ Can be used to engage external stakeholders

What to include ?

1. **Vision and context:**
   What is the overall vision and what 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?

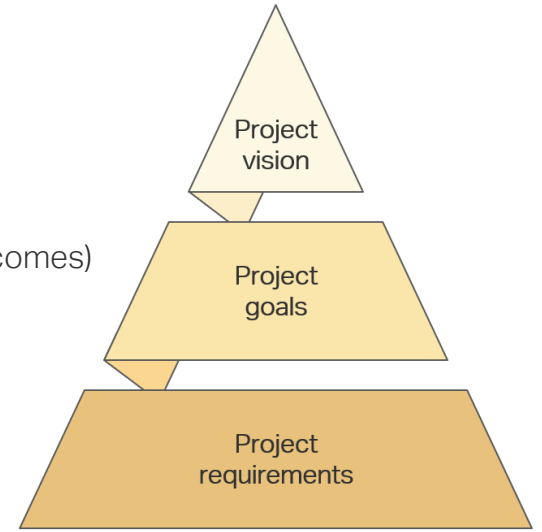
Optional: Include relevant data points to support the storyline, if available

B Project vision, goals, and requirements

Purpose Provide a common direction to project members and a shared understanding of what the project aims to achieve and under which conditions

What to include ?

1. Define the long-term project vision
2. Specify the project goals (desired outcomes)
3. Detail the project requirements



» To be **detailed further** in an **iterative process** throughout the Scoping Phase

» **Link** the implementation of green corridors to **specific, overall social, ecological or economic objectives of the region** (e.g. UN Global Compact, sustainability goals, climate action)

Example of a foundational narrative (Part A) – Chile

EXAMPLE

1 Vision and context

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

"Chile is one of the regions, which is **expected to be a global leader of renewable energy** for the remainder of this century. As a natural consequence, ministries and authorities in Chile, as well as international private companies are evaluating and exploring the **options for production of green hydrogen and alternative fuels in the country**, aiming at decarbonizing domestic maritime transportation and international trade by 2050. In 2021, Chile introduced a strategy for a Just Transition in the energy sector."

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2 Goals and value streams related to the vision

How does this project contribute to realizing the overall vision?

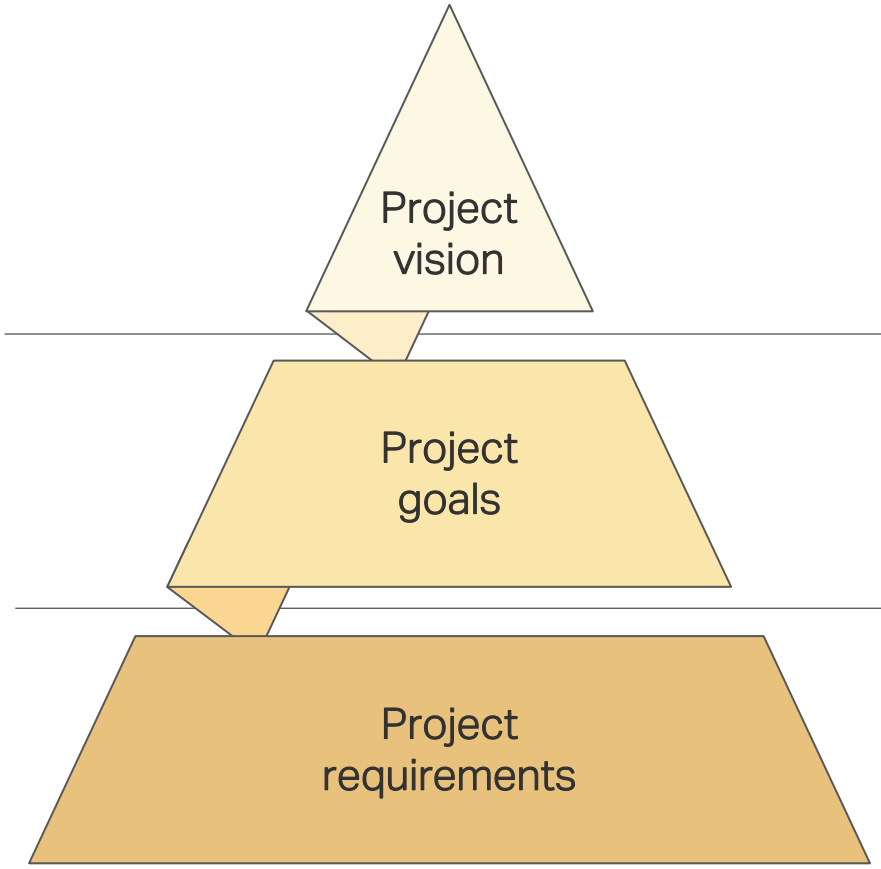
"The goal is to **identify a suite of possible green corridors** (domestic and international) which can operate on alternative fuel in this decade through focused action by a group of organizations related to the entire Zero Emission Shipping Value Chain (ZESVC)."

"Chilean energy projects are amongst the most developed in the world with a primary focus on production of green ammonia. Generally, up to 12 million tonnes of fuel are under development, out of which 40% is believed to be made available for maritime transportation. Furthermore, Chile has **two critical elements related to its geographic nature**, when it comes to the decarbonization of shipping (the propulsion of vessels and all of the supporting infrastructure): (1) The spatial orientation of the country means that **95% of all international transport in Chile occurs by water**, and (2) **enormous solar and wind capacity** is substantially exceeding the need of the population."

"At present, the predominant fuel for production (planned for in this decade) is **green ammonia**, with minor amounts of green methanol and green kerosene (diesel). An **anticipated sectoral competition is expected at a short time frame** of 10 years, but at a longer perspective the production capacity of alternative green fuels significantly outperforms the domestic use, and hence export of fuel / energy is being considered as well."

Template – Part B: Project vision, goals, and requirements

TEMPLATE

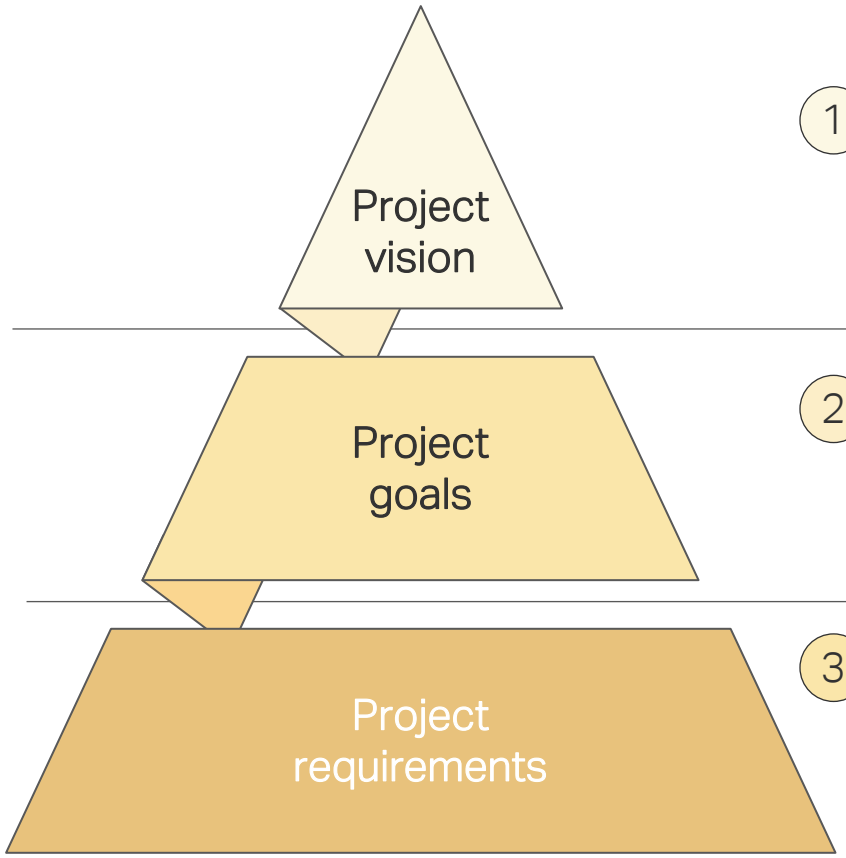


Questions to define the project vision, goals, and requirements:

1. What is the overall vision that the project is contributing to?
2. What are the project's desired outcomes?
3. What are the necessary requirements and procedures?

Example of project vision, goals, and requirements (Part B) - Chile

EXAMPLE



1 **What is the overall vision that the project is contributing to?**

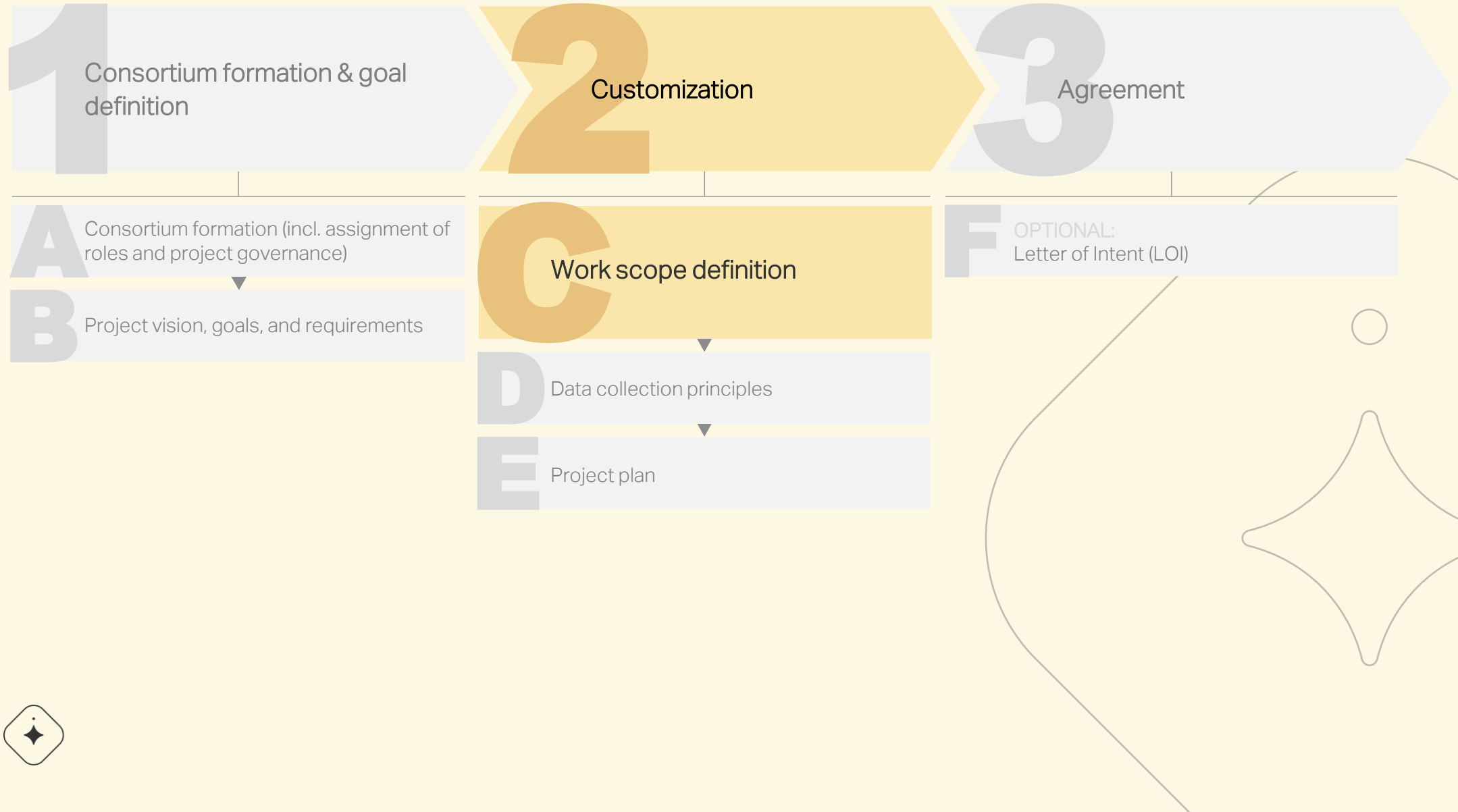
- Contribute to the Chilean national green hydrogen strategy by decarbonizing maritime transportation before 2050

2 **What are the project's desired outcomes?**

- Identify a suite of possible green corridors with ports in Chile (along domestic and international trade routes) which can operate on alternative fuel within this decade

3 **What are the necessary requirements and procedures?**

- Construct a broad project consortium of international organizations operating in Chile
- Take a data driven and fuel agnostic approach assessing all relevant low-zero emission alternative fuels
- Utilize the methods and requirements as established by MMMCZCS
- Identify 2-4 corridors which should be considered for Feasibility Assessment in 2023
- Deliver key results and findings from project before end of 2022
- Develop the entire project based on non-confidential data
- MMMCZCS to lead project – project members to support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2C. Work scope definition

Purpose

- The work scope definition is **a customized version** of the **Center's methodology** based on the **project's goals and scope.**
- Workstream Leads:
  - will use the methodology and the project's goals to **identify essential elements** for their workstreams
  - need to **provide key information** and **customize the methodology** for their respective workstreams
- The project lead **combines inputs** from different workstreams to **create a final** work scope definition.

Key questions

- Are there any **extra analyses** that workstream leads need to **add**?
- Are there **gaps** between the desired outcomes and the customized methodology?
- Are there **required adjustments which** the project lead — with input from consortium members — should point out to meet the study's specific needs?

Importance

- The work scope definition:
  - **outlines** all necessary activities and analyses for the Feasibility Study
  - **aids** in achieving desired goals and outcomes
- Serves as a **point of reference** alongside the project plan for workstreams during the Feasibility Study.
- Ensures **alignment and transparency** on the approach to reaching defined goals.
- **Contributes** to the project plan, guiding the Feasibility Study.
- Helps maintain **consistency** with the study's goals throughout the process.
- **Highlights the need for teamwork** among Workstream Leads and Project Lead.
- Outlines deviations from the standard method, and hence serves as a 'management of change' tool.

Template: Work scope definition – individual workstream

TEMPLATE

	A	B	C	D	E	F	G	H
1	**Workstream Description**							
2	**Name of the Workstream**						**Today's Date**	
3								
4	Alternative fuels							
5	**Project Name**						**Planned Start**	
6								
7								
8	**Workstream Lead**		**Workstream Support**				**Planned End**	
9								
10								
11								
12								
13	**Significant Milestones (Dates) and Required Deliverables**							
14								
15								
16	**Requested Result / Solution (incl. Completion Criteria)**							
17								
18								
19	**Critical Success Factors / Risks**							
20								
21								
22	**Detailed Activity Descriptions (Incl. All Involved / Participating Resources / Departments)**							
23	**Blueprint**				**Importance**			**Resources Required**
24	**Key questions**		**Workstream analyses**	**Comment**	**High**	**Medium**	**Low (Not included in**	**Hours / weeks**
25	2.1 What is the range of expected production capacity of alternative fuels relevantto the corridor, based on announced		2.1A Fuel choice and supply – supply possibilities within the region in a given					
26	2.2 What are the main drivers impacting the cost of alternative fuels and price for shipowners, and how will they		2.2A Fuel cost - show the expected costs and explain the main drivers behind					
27	2.3 What are the fuel emissionsdepending on the alternative fuel type and its origin?		2.3A Fuel emission - estimate the well-to-wake reduction potential for each alternative					
28	2.4 What is the range of expected import of alternative fuels relevant to the corridor, based on announced projects,		2.4A List new infrastructure/ capex investments required for each step of the					
29	2.5 What are the main drivers impacting the cost of imported alternative fuels and price for shipowners, and how		2.5A Fuel cost - show the expected costs and explain the main drivers behind					
30	2.6 What are the fuel emissions depending on the imported alternative fuel type and its origin?		2.6A Fuel emission - estimate the well-to-wake reduction potential for each alternative					
31	2.7 Additional considerations		2.7A ...					
32	**Interfaces and Relations to other Work Packages**							
33								
34								
35	**Attachment (Further Information)**							
36								
37								
38	**Other**							
39								
40								
41	**Signature Workstream Lead**							
42								
43								
44	**Signature Project Lead**							
45								
46								

Each Workstream Lead needs to provide key information and customize the methodology for their respective workstreams

1 **Overview:**
Fill in high-level workstream description, including milestones and key deliverables, desired results, success factors and risks

2 **Methodology customization:**

- For each step of the methodology, indicate its importance from high to low
- In the comment field, specify whether this step only applies to one aspect, e.g., a certain fuel type / vessel segment
- Outcome is the Work Scope Definition, including all steps marked as being of high / medium importance
- Add additional rows in the spreadsheet to add additional analyses to the methodology / Pre-Feasibility assessment, if relevant

3 **Comments and signatures:**
Add comments if necessary and, after review and alignment with the Project Lead, sign the document

Template: Work scope definition – full project

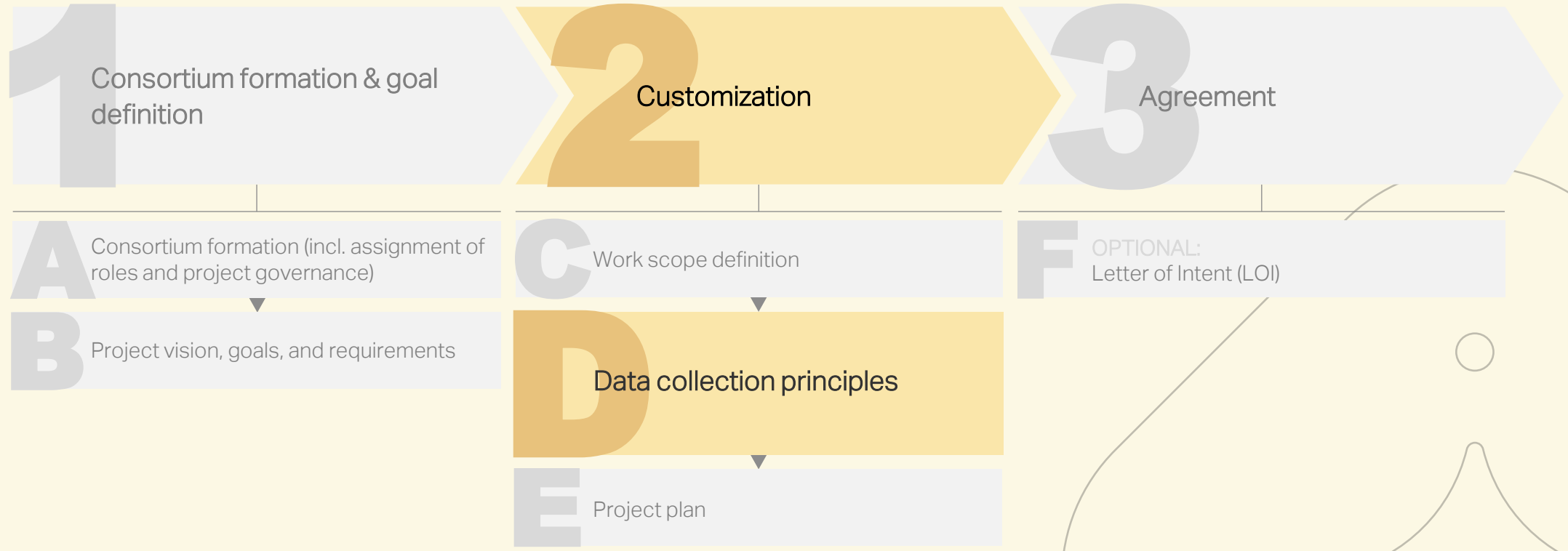
TEMPLATE

	A	B	C	D	E	F	G	H
1			**Work Scope Definition**					
2	**Project Name**						**Today´s Date**	
3								
4								
5	**Workstream Lead**		**Workstream Support**				**Planned Start**	
6								
7							**Planned End**	
8								
9	**Work Scope Definition**							
10	**Workstream 2 activities: Alternative fuels**					**Importance**		**Resources Required**
11	**Key questions**		**Workstream analyses**	**Comment**		**High**	**Medium**	**Hours / weeks**
12								
13								
14								
15								
16								
17								
18								
19	**Workstream 3 activities: Port, storage, and bunkering**					**Importance**		**Resources Required**
20	**Key questions**		**Workstream analyses**	**Comment**		**High**	**Medium**	**Hours / weeks**

The input from each Workstream Leads is consolidated into the aggregated work scope definition

1. **Overview:**
   Project Lead enters general introductory information

2. **Work Scope Definition:**
   Project Lead compiles Work Scope Definition based on input from Workstream Leads
   (The Excel sheet automatically draws activities directly from the Workstream Description sheets)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2D. Data collection principles

Purpose

- It is necessary to **collect data** to conduct the **analyses** in the Pre-Feasibility Study phase.
- Data is collected for **following domains using data collection templates**:
  - Renewable energy and alternative fuels
  - Port, storage, and bunkering infrastructure
  - Trade routes, vessels, cargo and services
  - Policy, regulation, and funding

Key questions

- **Source identification:**
  From where will the data be collected? What are the primary sources?
- **Data granularity:**
  What level of data granularity is needed to fulfill the study's objectives?
  This is necessary to ensure that the same granularity is applied through all workstreams.
- **Accuracy and reliability:**
  How will the accuracy and reliability of the collected data be ensured?
- **Validation and conditions:**
  Is there a systematic approach for data validation and conditions before analysis?
- **Storage and security:**
  Where will the data be stored? What measures are in place to ensure its security?

Importance

- **Ensuring Alignment in Scoping Phase:**
  The data collection templates that are shared during the Scoping phase foster alignment among stakeholders, and ensure a collective understanding of the granularity of data needed for the Study phase.
- **Guiding Pre-Feasibility Study Phase:**
  The data collection templates serve as a foundational guide for Workstream Leads during the Pre-Feasibility Study, as they provide a structured starting point for their efforts.
- **Impact on Assessment Accuracy:**
  The quality and thoroughness of data collected significantly influence the accuracy and reliability of the Pre-Feasibility Study and its resulting insights.

Data collection principles

During the Pre-Feasibility Study phase, data needs to be collected for Workstreams 2-5

	Workstream 2: Alternative fuels	Workstream 3: Port, storage, and bunkering infrastructure	Workstream 4: Trade routes, vessels, cargo and services	Workstream 5: Policy, regulation, justice and equitability
Which data is required?	Collection of data for renewable energy and fuel project, capacity and possible fuel cost of origin	Collection of port-related data, e.g., port-specific trade, readiness for handling the new future fuels, and current and future infrastructure	Collection of cargo and vessel data, e.g., vessel-specific trade and services	Collection of regulatory data for the area of focus, e.g., at port / region / country / continent level
Why is it important?	Required for analyses in Pre-Feasibility Study Phase, e.g., for project maturation and sectoral competition analysis	Required for analyses in Pre-Feasibility Study Phase, e.g., for port readiness level assessment	Required for analyses in Pre-Feasibility Study phase, e.g., for vessel selection	Required for analyses in Pre-Feasibility Study Phase, e.g., for regulatory assessment

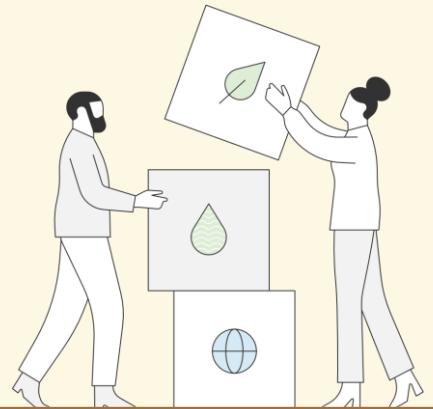
See the next slides for available templates to assist with data collection:
Adjust the data templates as per the project's needs and availability of data

Workstream 2: Alternative fuels – Data collection template

TEMPLATE

Collect data points for relevant fuel projects: location, capacity and expected production volumes, among others

Estimate the **cost of origin** for selected alternative fuels if possible



Tab. 2.1: Overview of relevant fuel projects

	Fuel project 1	Fuel project 2	Fuel project 3	Fuel project 4	Fuel project 5	Fuel project 6
Company name						
Site (location)						
State (region)						
Fuel type						
Capacity (KT/year)						
Renewable source (e.g., sun, wind, hydro)						
Status (in operation, final investment decision (FID), sanction, Feasibility study (F/S), idea						
Energy performance certificate (EPC)						
Renewable supply (e.e., underway, in place)						
Financing (e.g., underway, in place)						
Groundwork (e.g., underway, completed)						
Construction (e.g., underway, completed)						
Commencement target year/ forecast						
Production volume in 2025 (KT)						
Production volume in 2030 (KT)						
Production volume in 2035 (KT)						
Production volume in 2040 (KT)						
Production volume in 2050 (KT)						
Offtake agreements						

Tab. 2.2: Fuel Cost of origin

Cost in USD / GJ and USD / t

Fuel type	Unit	Existing	2025	2030	2035	2040	2045
	in USD / GJ						
	in USD / t						
	in USD / GJ						
	in USD / t						
	in USD / GJ						
	in USD / t						

Workstream 3: Port, storage, and bunkering infrastructure – Data collection template

TEMPLATE

Data related to port, storage, and bunkering infrastructure is collected and is divided into 6 areas:

- **Port-specific restrictions** (such as water depth or number of cranes)
- **Port-specific trade – Imports** (split into refrigerated, bulk, liquid cargo, etc.)
- **Port-specific trade - Exports** (split into refrigerated, bulk, liquid cargo, etc.)
- **Current infrastructure** (overview of bunkering and truck, barge, pipe infrastructure at port)
- **Future infrastructure – Bunkering** (by fuel and year)
- **Future infrastructure – Call** (by fuel and year)
- **Future infrastructure – Cargo**

Tab. 3.1: Port Specific Restrictions

Port [Name]	Ownership [type]	Location [UTM X]	Location [UTM Y]	Water depth [m]	Congestion degree	Max. Ships per day	Max. Storage capacity	Number of cranes

Tab. 3.2: Port-specific trade - Imports

Port [Name]	General cargo				
	Tonnage per port (in	Port share of cargo ty	Value (FOB) per port	Port share of cargo ty	Tonnage per p
Total	-	-	-	-	

Tab. 3.3: Port-specific trade - Exports

Port [Name]	General cargo				
	Tonnage per port (in	Port share of cargo ty	Value (FOB) per port	Port share of cargo ty	Tonnage per p
Total	-	-	-	-	

Tab. 3.4: Current infrastructure - Overview of bunkering and infrastructure options available per port

Port [Name]	Operator [Name]	Fuel type [yes; no]		Infrastructure i	
		Alternative Fuel 1	Alternative Fuel 2	Truck	Barge

Tab 3.5: Future infrastructure - Bunkering

Alternative Fuel 1

Port and Fuel type	2023	2025	2030	2040	2050
Port 1 - Alternative Fuel 1					
Port 2 - Alternative Fuel 1					
Port 3 - Alternative Fuel 1					
Port 4 - Alternative Fuel 1					
Port 5 - Alternative Fuel 1					

Alternative Fuel 2

Port and Fuel type	2023	2025	2030	2040	2050
Port 1 - Alternative Fuel 2					
Port 2 - Alternative Fuel 2					
Port 3 - Alternative Fuel 2					
Port 4 - Alternative Fuel 2					
Port 5 - Alternative Fuel 2					

Tab 3.6: Future infrastructure - Call

Alternative Fuel 1

Port and Fuel type	2023	2025	2030	2040	2050
Port 1 - Alternative Fuel 1					
Port 2 - Alternative Fuel 1					
Port 3 - Alternative Fuel 1					
Port 4 - Alternative Fuel 1					
Port 5 - Alternative Fuel 1					

Alternative Fuel 2

Port and Fuel type	2023	2025	2030	2040	2050
Port 1 - Alternative Fuel 2					
Port 2 - Alternative Fuel 2					
Port 3 - Alternative Fuel 2					
Port 4 - Alternative Fuel 2					
Port 5 - Alternative Fuel 2					

Workstream 4: Trade routes, vessels, cargo and services – Data collection template

TEMPLATE

Trade routes, vessel, cargo, and services-related data collection is divided into 7 areas:

- **Overall assessment of import/export into region,** independent of mode of transportation
- **Vessel analysis** (emissions and fuel consumption)
- **Vessel-specific trade – Imports** (e.g., volume, value, origin, etc.)
- **Vessel-specific trade – Exports** (e.g., volume, value, origin, etc.)
- **Vessel-specific services – Domestic services** (e.g., number of passengers, destination, etc.)
- **Vessel-specific services – International services** (e.g., number of passengers, destination, etc.)

Tab. 4.1: Vessel analysis - Emissions and fuel consumption

Summary of fuel consumption and CO2 emissions (TtW) for defined region fleet during a defined time phase

	Vessel segment 1	Vessel segment 2	Vessel segment 3	Vessel segment 4	Vessel segment 5
Ships (#)					
Voyages (#)					
Emission factor (#)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Fuel Main (kT/yr)					
Fuel Aux (kT/yr)					
Total fuel (kT/yr)	-	-	-	-	-
CO2 emissions (kT/yr)					

Tab. 4.2: Vessel-specific trade - Imports

Product	Volume (in t)	Share of total tonnage (in %)	Value (FOB in US $)	Share of total value (in %)	FOB / tonnage
Product 1		#DIV/0!		#DIV/0!	#DIV/0!
Product 2		#DIV/0!		#DIV/0!	#DIV/0!
		#DIV/0!		#DIV/0!	#DIV/0!
		#DIV/0!		#DIV/0!	#DIV/0!
		#DIV/0!		#DIV/0!	#DIV/0!
		#DIV/0!		#DIV/0!	#DIV/0!
		#DIV/0!		#DIV/0!	#DIV/0!
Total	-	**#DIV/0!**	-	**#DIV/0!**	**#DIV/0!**

Tab. 4.3: Vessel-specific trade - Exports

Product
Product 1
Product 2
Total

Tab. 4.4: Vessel specific ser

Service
Service 1
Service 2
Service 3
Total

Tab. 4.5: Vessel specific service - International services

Service	Number of passengers / cars / units	Share of total number (in %)	Where to (main country)	Vessel segment	Growth
Service 1		#DIV/0!			
Service 2		#DIV/0!			
Service 3		#DIV/0!			
		#DIV/0!			
		#DIV/0!			
		#DIV/0!			
		#DIV/0!			
Total	-	**#DIV/0!**			-

Tab 4.6: Green premium - Incremental cost of green for a unit of cargo

Additional cost of transport in green corridors

Product / Service	Transport Cost LSFO (in US $)	Transport Cost alternative fuel 1 (in US $)	Incremental cost of green in %	Transport Cost alternative fuel 2 in (US $)	Incremental cost of green in %	Tr
Product 1						
Product 2						
Product 3						
Product 4						
Product 5						
Product 6						
Product 7						
Product 8						
Product 9						
Product 10						

Tab. 4.7: Green premium - Incremental cost of green for a service

Additional cost of services in green corridors

Product / Service	Transport Cost LSFO in (US $)	Transport Cost alternative fuel 1 (in US $)	Incremental cost of green in %	Transport Cost alternative fuel 2 in (US $)	Incremental cost of green in %	Tr
Service 1						
Service 2						
Service 3						
Service 4						
Service 5						
Service 6						
Service 7						
Service 8						
Service 9						
Service 10						

TEMPLATE

Workstream 5: Policy, regulation, just & equitable – Data collection template

Collection of regulatory data can take place on **port, region, country, or continent level**

Just & Equitable assessment will be done at country level or at regional level where possible.

Refer to the *Regulatory assessment* guideline to identify on which level the data needs to be collected

Tab. 5.1: Regulatory involvement – Continent level

1. Data collection and assessment			
Type of regulation	Regulator		

Tab. 5.2: Regulatory involvement – Country level

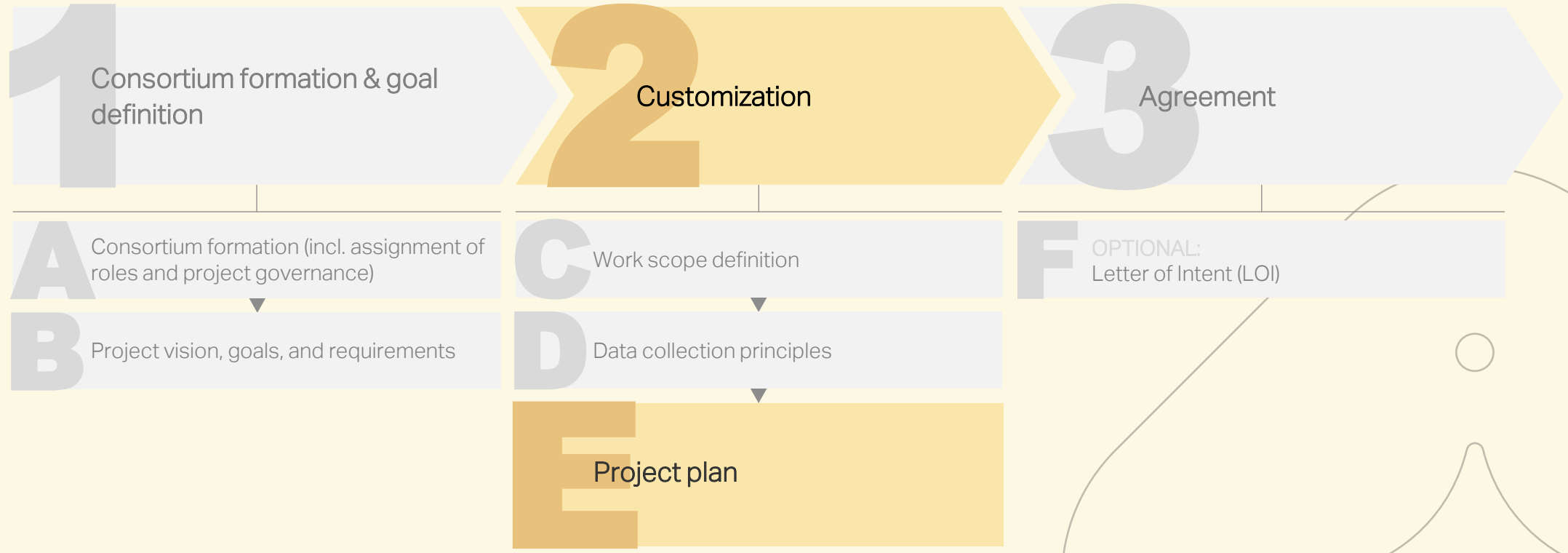
1. Data collection and assessment			
Type of regulation	Regulator		

Tab. 5.3: Regulatory involvement – Region level

1. Data collection and assessment			
Type of regulation	Regulator		

Tab. 5.4: Regulatory involvement – Port level

1. Data collection and assessment			
Type of regulation	Regulator	Key statements	Source


1
Consortium formation & goal definition
2
Customization
3
Agreement
A
Consortium formation (incl. assignment of roles and project governance)
B
Project vision, goals, and requirements
C
Work scope definition
D
Data collection principles
E
Project plan
F
OPTIONAL:
Letter of Intent (LOI)

2E. Project plan

Purpose

- Serves as a **point of reference** for the project team, to hold each other accountable against the agreed timeline during the Pre-Feasibility Study.
- Provide a **clear and transparent overview** of workstream activities, meeting cadence, key deliverables and deadlines.
- **Allocate resources** effectively to complete the project.
- **Identify risks and roadblocks** early.
- **Input** for the **letter of intent.**

Key questions

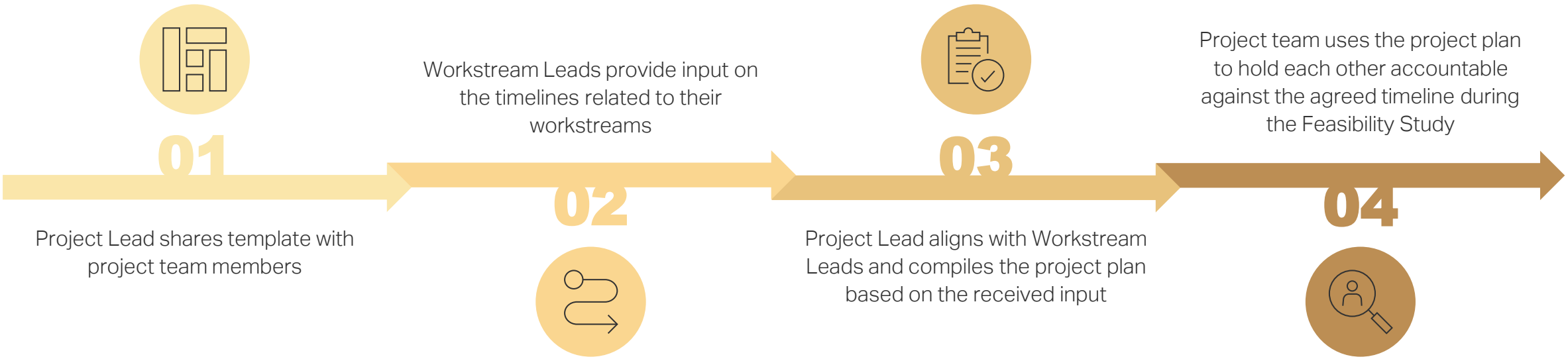
- **Activity Overview:**
  What is the comprehensive overview of workstream activities provided by the project plan?
- **Resource Allocation:**
  How does the project plan effectively allocate resources to ensure the completion of the project in accordance with the agreed deadline?
- **Risk Identification:**
  What mechanisms does the project plan employ to identify and address risks and roadblocks early in the project life cycle?
- **Accountability and Timelines:**
  In what ways does the project plan serve as a point of reference for the project team to hold each other accountable against agreed timelines during the Pre-Feasibility study?

Importance

- A shared and clear project plan is paramount for the **efficient execution** of any project.
- As the green corridor projects involve **several stakeholders**, who are often **not familiar with working with each other** and are potentially in **different time zones**, it is important that everyone works according to the same plan.
- The project plan also gives a **clear outline** of interdependencies between the workstreams.

Project plan

The project plan serves as a common point of reference throughout the entire project



Pre-Feasibility Study template: Develop a Pre-Feasibility Study project plan

TEMPLATE

Pre-Feasibility Study		Year																							
		Month				Month				Month				Month				Month				Month			
ID	Workstream	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	Introduction, vision, and projec																								
2	Alternative fuels																								
3	Port, storage, and bunkering infr																								
4	Trade routes, vessels, cargo and																								
5	Policy, regulation, and funding																								
6	Selecting 1st suite of corridors																								
7	Selecting 1st wave corridors and																								
Milestones		Month				Month				Month				Month				Month				Month			
ID	Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	Steering group meeting																								
B	Workshop																								
C	Status Meeting																								

1	Introduction, vision, and projec	Year																							
		Month				Month				Month				Month				Month				Month			
ID	Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																									

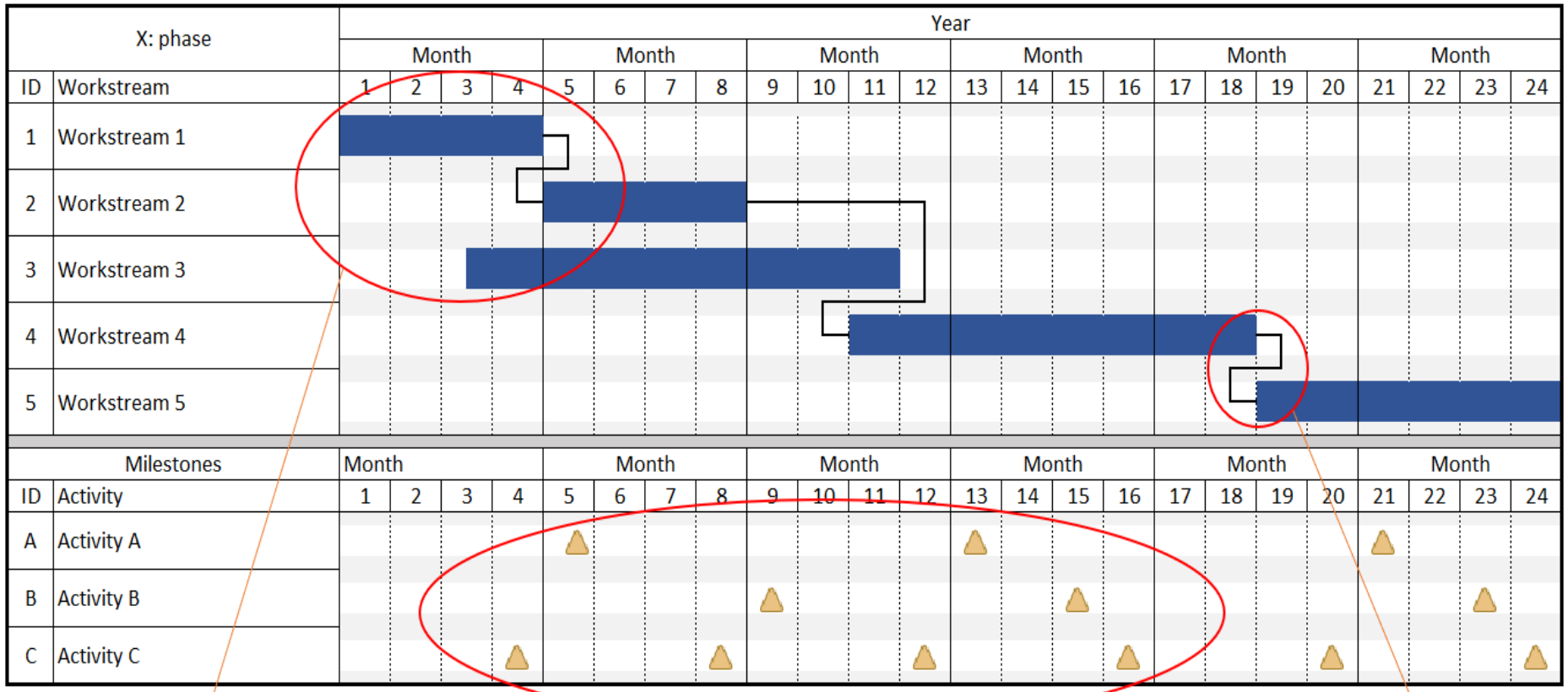
1. **Enter the expected full duration of the workstreams** here and indicate with lines (use the "Draw Border" tool) if they depend on each other

2. **Insert key milestones** here

3. **Deep dive on each of the workstreams if possible.** List tasks, their duration, and key milestones. Can serve as input to overarching project plan at the top of the sheet

Instructions: The Excel tool can be used to create customized project plans

EXAMPLE



1 Mark the white blocks and color them in a darker color

2 If chapters/tasks are depending on each other, use "Draw border" tool to connect the bars

3 For Milestones: By typing a 1 in the cell, a milestone is added for the respective activity for the corresponding week/month

1 Consortium formation & goal definition

- **A** Consortium formation (incl. assignment of roles and project governance)
- **B** Project vision, goals, and requirements

2 Customization

- **C** Work scope definition
- **D** Data collection principles
- **E** Project plan

3 Agreement

- **F** OPTIONAL: Letter of intent (LOI)

3F. Letter of intent (LOI)

Purpose

- The LOI **outlines mutual intentions** for collaborative efforts in the Pre-Feasibility Study Phase.
- It does **not** create **legally binding obligations**, **except** for **confidentiality** provisions and agreements as to how communication is planned.
- Establishes a **framework** for ongoing discussions and cooperation.
- Articulates **general principles and objectives** guiding the parties.
- **Acknowledges** potential necessity for a **legally binding project agreement** at a **later stage**.

Key questions

- Is it **necessary** to include an LOI in the Pre-Feasibility Scoping Phase?
- What are the **general principles and objectives** articulated in the LOI?
- How does the LOI handle legally binding obligations, particularly regarding **confidentiality provisions**?
- What is the **prerequisite** for project team members to sign the LOI regarding the completion of other activities in the Pre-Feasibility Scoping Phase?

Importance

- The LOI is an **optional element**, it determines the **end** of the **scoping** phase.
- Could be required when **public announcements are expected** or **mutual intention** formalization is desired.
- Serves as a **point of reference** for guiding principles, conditions, and responsibilities.
- All **other activities** in the Pre-Feasibility Scoping Phase must be **completed** for project team members to sign the LOI.

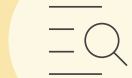
The Letter of Intent (LOI)

The Letter of Intent (LOI) is set up by the Project Lead and reviewed by all project team members

Create the initial LOI

The **Project Lead** is tasked with drafting the **initial version** of the LOI using the provided **template**

Share, review, and adjust the LOI



- Project Lead shares the initial draft version of the LOI with Workstream Leads
- Legal teams of the Workstream Leads **review the legal terms** of the LOI, while project team members of the Workstream Leads **review the project description (PD).**
- The **feedback is then iterated** between the Project Lead and the Workstream Leads

Finalize the LOI

- The Project Lead **adjusts** the LOI **based on feedback** from Workstream Leads.
- The **finalized LOI** is **distributed** to all project team members for their **signatures**

TEMPLATE

Template: LOI

The LOI includes two parts: the legal terms and a project description. An example of LOI content is given below.

A Legal terms

Start with creating:

- A list of signing parties (name, address)
- A short description of each signing party

Followed by the sections (deep dive on next slides):

1. Background
2. Validity and Legal Effect
3. Documents
4. The study
5. Confidentiality
6. Publication
7. Non-exclusion
8. Term and Termination
9. Choice of Law and Dispute Resolution
10. Signatures

To be reviewed by legal teams of Workstream Leads

B Schedule Project Description (PD)

1. Introduction
2. The Project
   - A. Project overview
   - B. Project vision
   - C. Project goals
   - D. Project timeline
   - E. Project organization
   - F. Roles and responsibilities
3. Commitment and contribution
4. Finance and budget (if relevant)
5. Reporting

Use Project vision, goals, requirements, and narrative (see 1B)

Use Pre-Feasibility Study project plan (see 2E)

Use Consortium formation, incl. assignment of roles and project governance (see 1A)

To be reviewed by project team members of Workstream Leads

Template: LOI – Part A: Legal terms (1/3)

TEMPLATE

An overview of signees and participating companies is required to set up the LOI. Template to be sent out to project members

Signees / Project Supervision / Key Personnel

- Name
- Job Title
- Company
- E-Mail Address / Mobile Number

Companies

- Partner Full Registration Name
- Company reg. no.
- Address
- Postal Code
- Country
- Other relevant information for the specific area

Template: LOI – Part A: Legal terms (2/3)

TEMPLATE

Section in the LOI	Key content/ messages
1 Background	By signing this LOI, the **Parties confirm their strong intentions to initiate the collaboration to** carry out the pre-feasibility study.
2 Validity and Legal Effect	This LOI is **solely an expression of the Parties' intentions** and shall **not constitute any legally binding obligations** for the Parties, **except for confidentiality obligations**
3 Documents	The **Schedule [PD] (Project Description) is an integral part of this LOI** and all references made to this LOI include a reference to the Schedule [PD] Project Description
4 The study	The "Project" shall mean the **project governed by this LOI as described in Schedule [PD] Project Description**
5 Confidentiality	The Parties are obliged to **keep confidential any information that is exchanged between the Parties in connection with the Project and that is explicitly and clearly marked as confidential** upon disclosure Where **disclosure is required by law,** prior to such disclosure the receiving Party shall consult with the disclosing Party in good faith about the terms of the receiving Party's disclosure of the disclosing Party's confidential information The confidentiality obligations set out in Section 6 will survive termination of this LOI **for a period** xx **years from termination of this LOI**

Template: LOI – Part A: Legal terms (3/3)

TEMPLATE

Section in the LOI	Key content/ messages
6 Publication	For the purpose of this LOI, **"Publication"** means (i) the publication of an **abstract, article, study, paper or similar** in a journal or in other public domains, (ii) **presentations** at a conference, seminar or other public domains, and (iii) **any other disclosure** that is meant to inform or present a certain topic to a wider group of recipients or unidentified audience, and **"Publish" and "Publishing"** are to be construed as meaning the same **Joint publication:** The Parties shall in good faith discuss a joint initial Publication of the Project results and the general principles for references to the Parties' involvement in this Project **Required Publication:** subject to the confidentiality obligations, the requirement for publicity shall be honored in good faith by all project participants.
7 Non-exclusive	This LOI is **non-exclusive** and nothing in this LOI shall prevent or restrict a Party from entering into identical or similar arrangements, letters of intent and/or agreements with any other persons or entities

8 Term and Termination	**Start date:** When all parties have signed the LOI, counting from the date on which the last Party signed it **('Effective Date')**
	End date:
	• If the Parties enter into the **contemplated Agreement** or a similar agreement governing the Project
	  • LOI automatically terminates when **project is completed**
	  • LOI ends on a defined **'Expiration Date'**
	• If the contemplated Agreement is not entered into or the Project is not completed 30 calendar days prior to the Expiration Date, and upon notice from a Party to the other Parties, the Parties agree to enter into good faith discussions for an **extension of the term of this LOI**

Template: LOI – Part B: Schedule (PD) Project Description

TEMPLATE

Section in the LOI	Key content/ messages
1 Introduction	This **Schedule [PD] sets out the main parts of the Project details**. Including the **Project Title**
2 The Project	A. Project overview B. Project vision C. Project goals D. Project timeline E. Project organization F. Roles and responsibilities Use Project vision, goals, requirements, and narrative (see 1B) Use Pre-Feasibility Study project plan (see 2E) Use Consortium formation, incl. assignment of roles and project governance (see 1A)
3 **Commitment and contribution**	The Parties have **committed to contribute to the Project by providing the human, financial and/or material contributions** on those terms set out in this LOI (e.g., workstream internal meetings organized by Workstream Lead, status meetings with the whole project team, workshops with the whole project team)
4 **Finance and budget, if relevant**	**Each party shall bear its own costs and expenses** incurred in connection with the performance of the Pre-Feasibility Study under this LOI
5 **Reporting**	The Parties will meet to **report on agreed content** as previously decided

Congratulations on successfully completing the pre-feasibility scoping phase of your green corridors project!

With a solid team, established governance, and a clear scope of work, you are now fully prepared to move forward. If a letter of intent has been signed, an extra layer of commitment has been added.

What comes next?

You are now ready to start on the Pre-Feasibility Study phase, where a suite of possible green corridors will be matured.

Simply click here to access the ready-to-use methodology for the next crucial step in this green corridor journey.

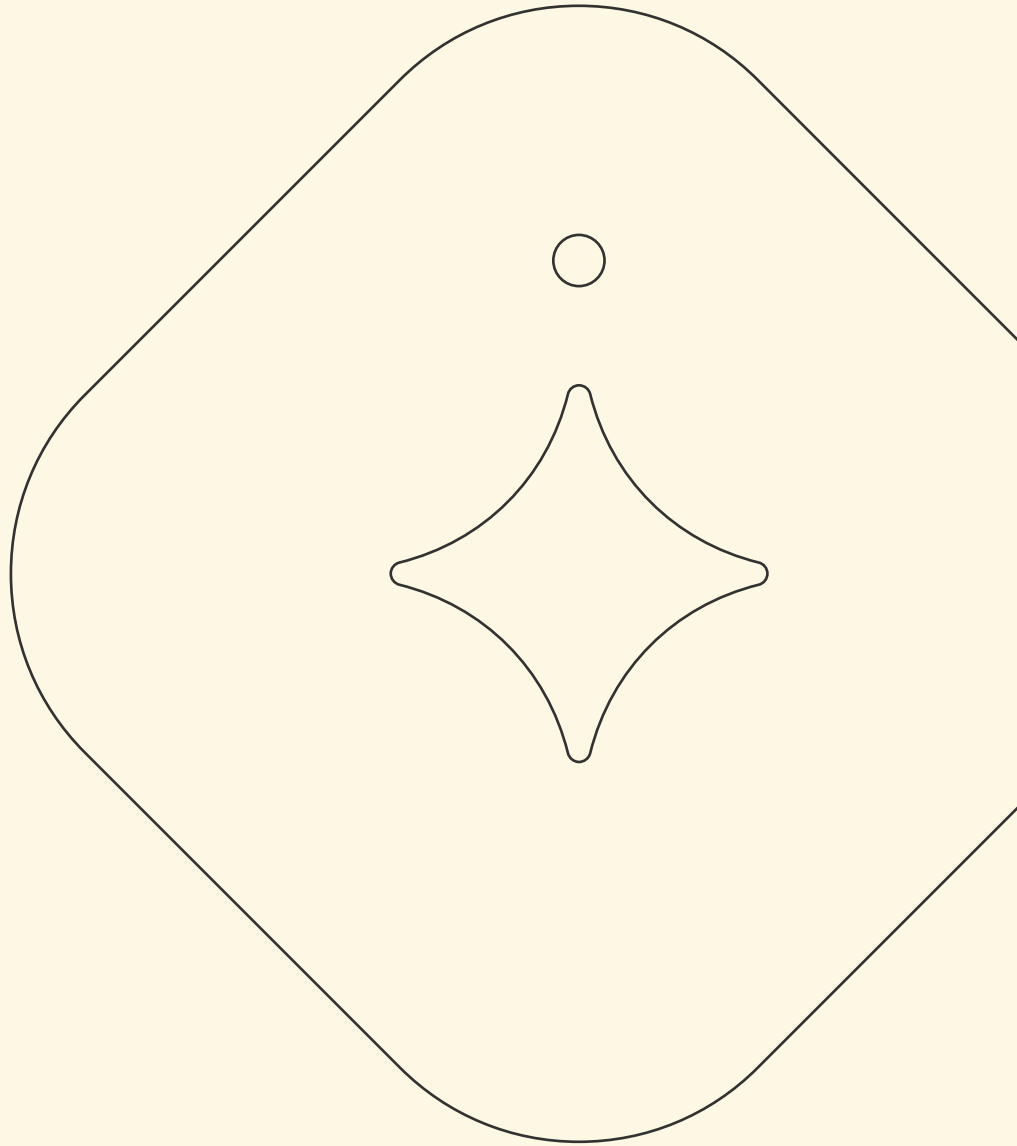
Disclaimer

This Methodology is provided "as is" without any warranty of any kind, express or implied, including but not limited to merchantability, accuracy, completeness, or fitness for a particular purpose. Any reliance you place on this Methodology is strictly at your own risk.

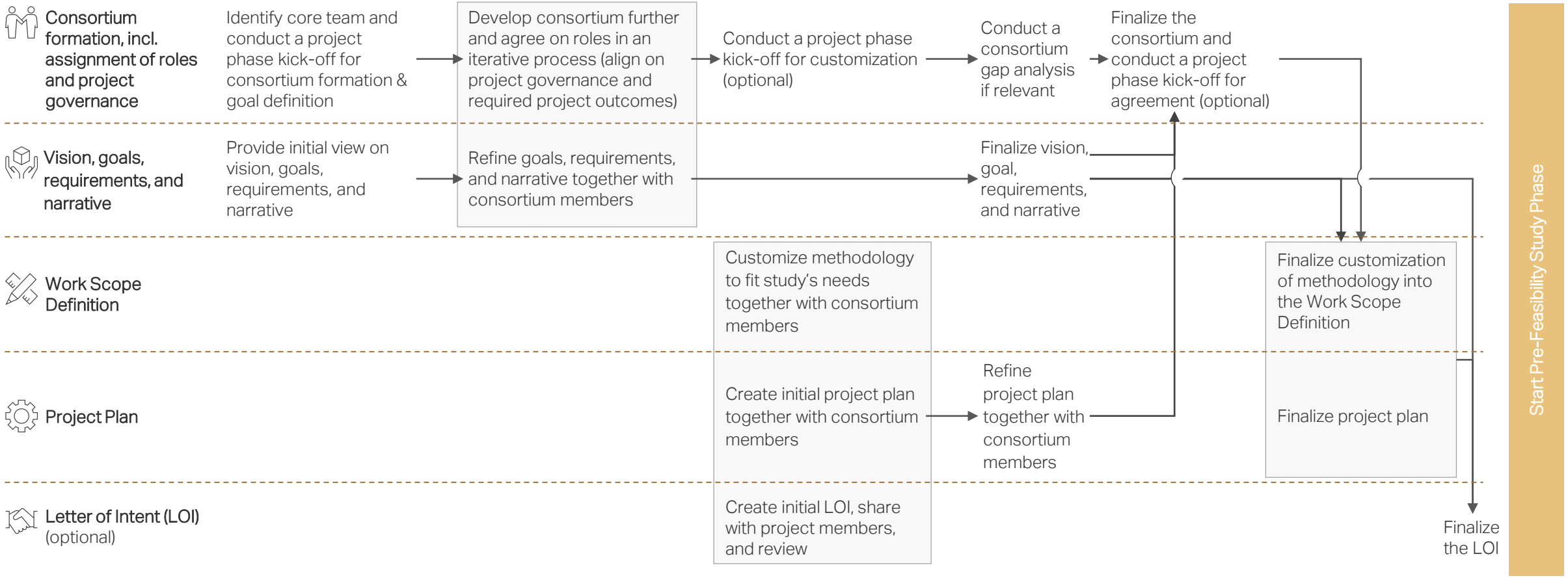
While every effort has been made to ensure the accuracy and effectiveness of the content, Fonden Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping shall not be liable for any errors or omissions in the content, nor for any loss or damage arising from the use of the Methodology.

The example Letter of Intent included in the Methodology is for illustrative purposes only and shall not be considered legal advice.

Appendix



Sequencing of all key activities



* Not each activity / step in the flowchart is required for every project. Some may be left out depending on project scope / consortium members, etc.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