International Partnership for Hydrogen and Fuel Cells in the Economy

International regulations, codes and standards on fuel cell applications and hydrogen in the maritime sector

Laurent ANTONI

Executive Director

Laurent.antoni@iphe.net

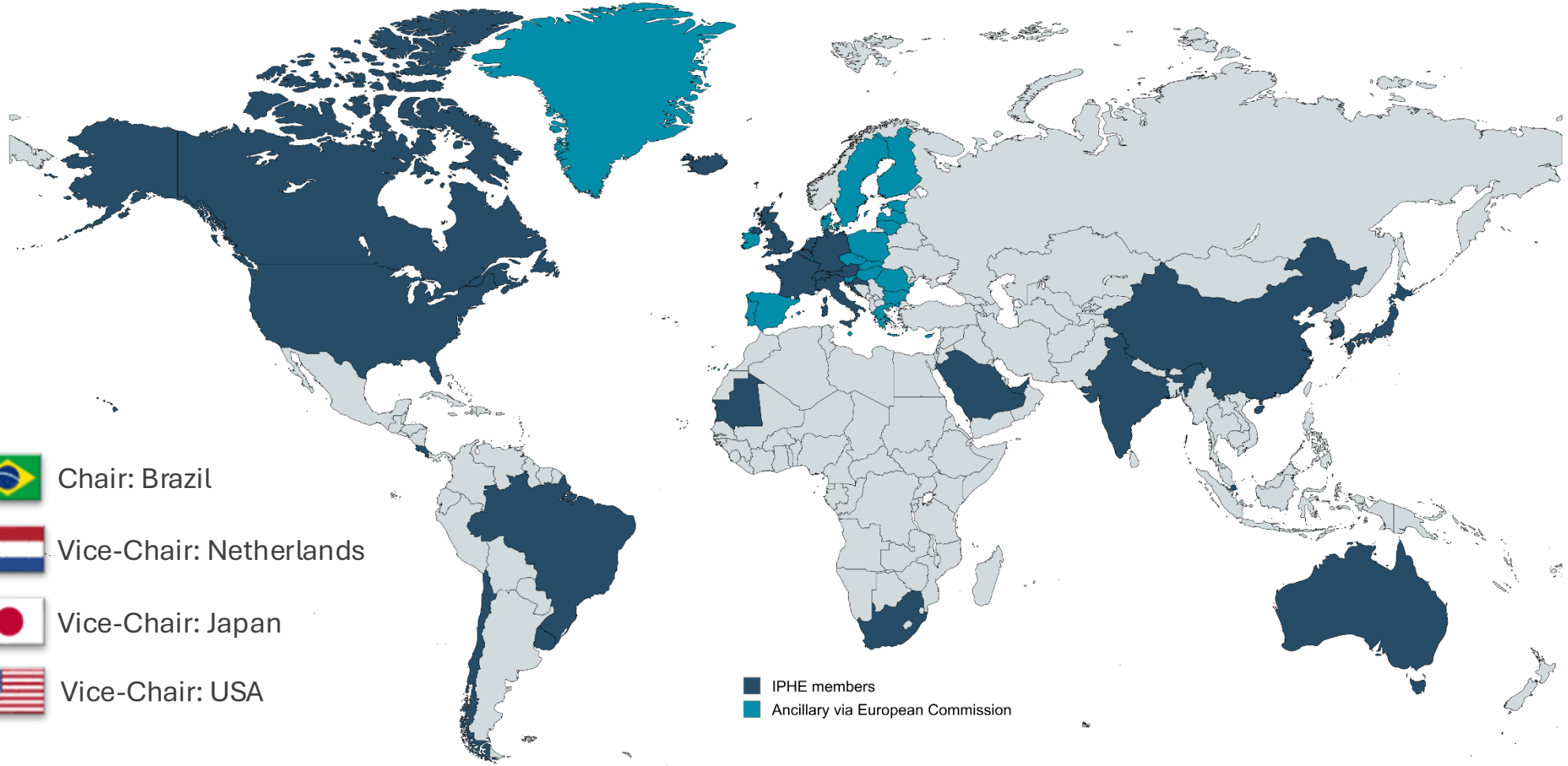
Outline

1. Introduction to the IPHE

2. Maritime Codes and Standards Prioritization
   a) Introduction to the Maritime Task Force
   b) Prioritization worksheet methodology and preliminary results

3. Maritime Case Studies

IPHE: A Government-to-Government Partnership



Chair: Brazil

Vice-Chair: Netherlands

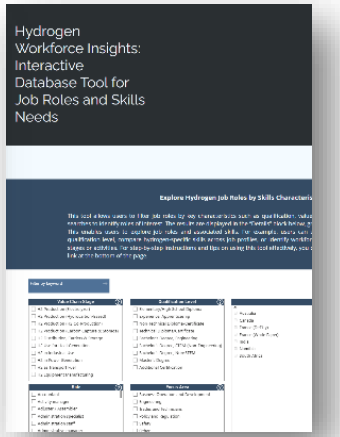
Vice-Chair: Japan

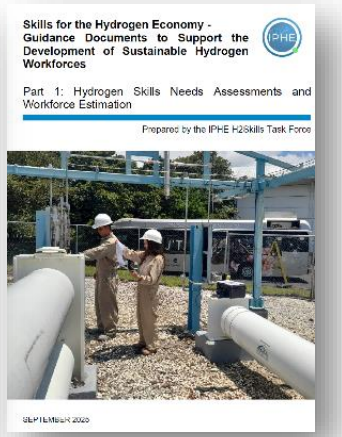
Vice-Chair: USA

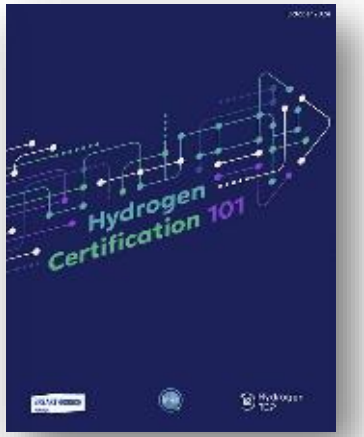
26 Countries & European Commission | Founded in 2003

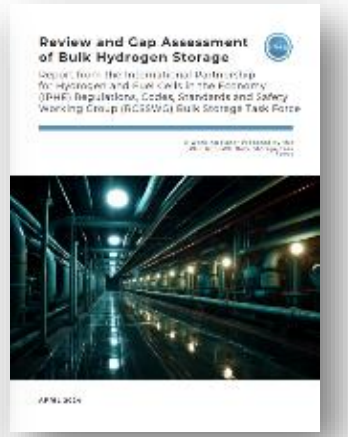
IPHE priorities: share information

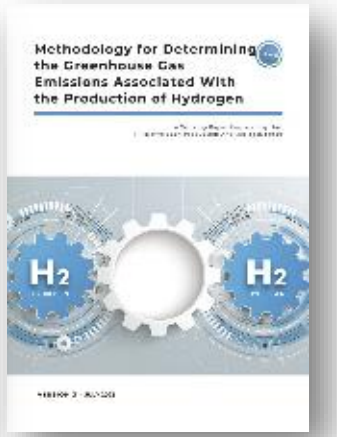
All documents produced by the task forces and working groups of IPHE stem from government-to-government exchanges and work **exclusively**. They are **publicly available**. They are often presented through dedicated webinars.











The IPHE Secretariat maintains database listing **national hydrogen strategies** and technology **deployments** as well.

All resources are available here: https://www.iphe.net/intelligence

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Activity 1 – Maritime Codes and Standards Prioritization

IPHE Maritime Task Force

Maritime TF – Context and Objective

- The mandate of the IPHE's Maritime Regulations, Codes and Standards Gaps and Risk Analysis Task Force (Maritime Task Force) is to identify gaps in regulations, codes and standards on hydrogen in the context of the maritime section and foster collaboration to address these:
  - **Identify gaps** in regulation, codes and standards on hydrogen in the maritime sector that could hinder the development of the global hydrogen economy
  - **Prioritize the gaps** that need addressing – in terms of importance, timing and resources required
  - **Make recommendations** for addressing these gaps, in particular on where international collaboration is required

Maritime TF – Scope of Work

The Maritime Task Force scope of activities covers regulations, codes, and standards that present could present barriers to the:

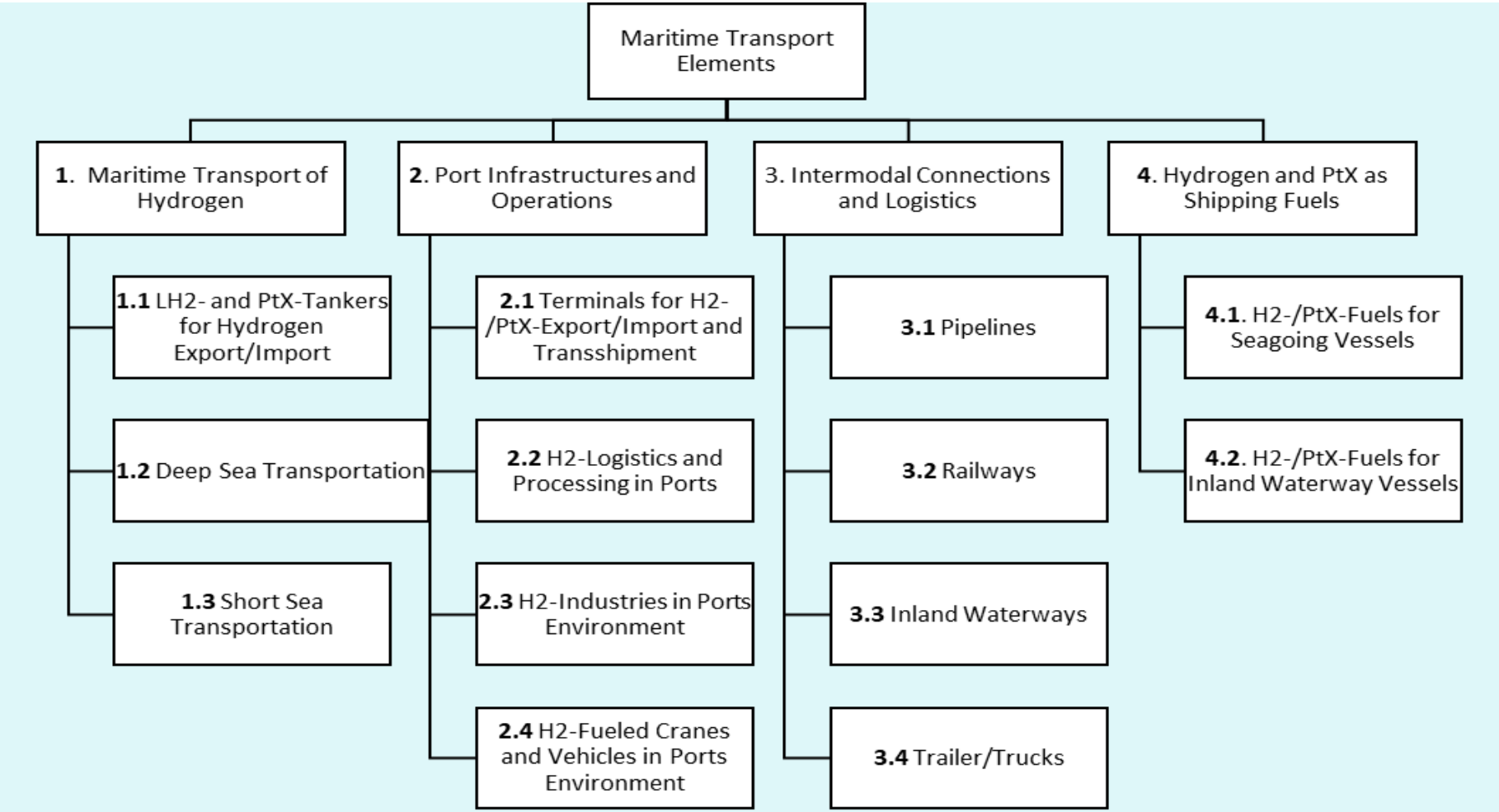
1. Cross-border transport/trade of hydrogen and its derivatives
2. Transport of hydrogen and its derivatives, including inland waterways
3. Use of hydrogen and its derivatives as a low-carbon fuel for the maritime sector
4. Use of hydrogen and its derivatives as a low-carbon fuel in ports operation (e.g., forklifts, cranes)

Maritime TF Activities

The maritime task force is undergoing three main activities to achieve its objectives:

1. Conduct survey of member states to identify areas of prioritization and assess gaps
2. Seek member states' maritime representative involvement for detailed case studies
3. Further elaborate learnings with outcomes, to identify key trends and country profiles, to collate in the Maritime TF report

Focus Areas for Prioritization



Scoring Structure

1. Difficulty (Investment of Resources) A high score means the project can be completed without a significant additional investment of resources.	3 - low resource requirement 2 - medium resource requirement 1 - resource intensive
2. Criticality (Safety/Quality Implications). A high score means the hydrogen value chain element is more critical.	3 - critical 2 - somewhat critical 1 - not critical
3. Achievability (Timeline to Complete) A high score means there's a good probability of completing standards development soon.	3 - project near completion 2 - project underway 1 - new project
4. Effect (Return on Investment) A high score means there are significant gains for the industry by completing the project.	3 - high return 2 - medium return 1 - low return

Example

	Scope (Investment of Resources)	Criticality (Safety /Quality Implications)	Achievability (Timeline to Complete)	Effect (Return on Investment)
Maritime Transport of Hydrogen				
1.1 LH2- and PtX-Tankers for Hydrogen Export/Import				
1.2 Deep Sea Transportation	**2**	**3**	**1**	**3**
1.3 Short Sea Transportation				
Port Infrastructures and Operations				
2.1 Terminals for H2-/PtX-Export/Import and Transshipment				
2.2 H2-Logistics and Processing in Ports				
2.3 H2-Industries in Ports Environment				
2.4 H2-Fueled Cranes and Vehicles in Ports Environment				

Scope
3 - low resource requirement
2 - medium resource requirement
1 - resource intensive

Criticality
3 - critical
2 - somewhat critical
1 - not critical

Achievability
3 - project near completion
2 - project underway
1 - new project

Effect
3 - high return
2 - medium return
1 - low return

Interpretation of Prioritization Score

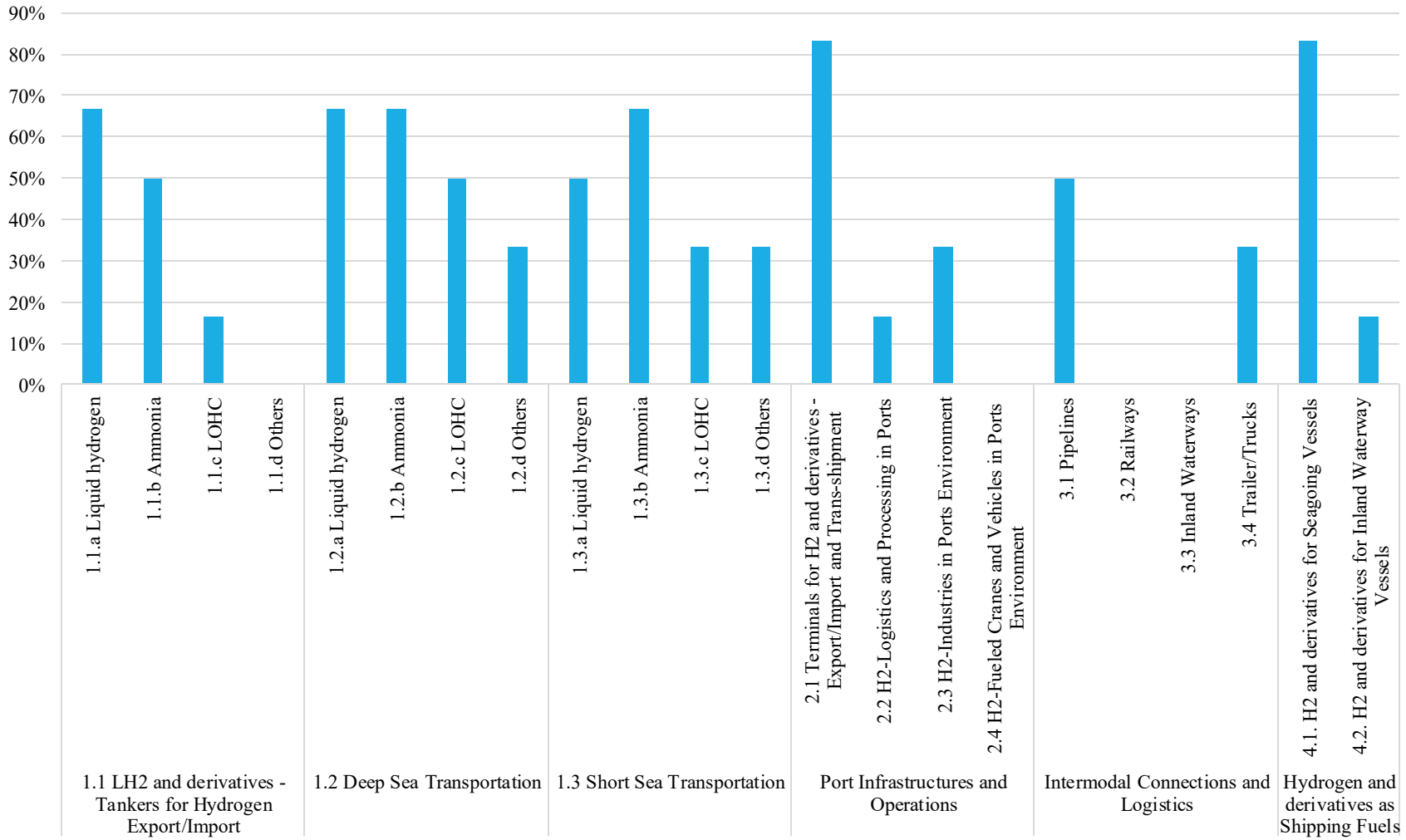
PRIORITISATION

Total Points = A + B+ C + D

A maximum of 12 pts can be assigned

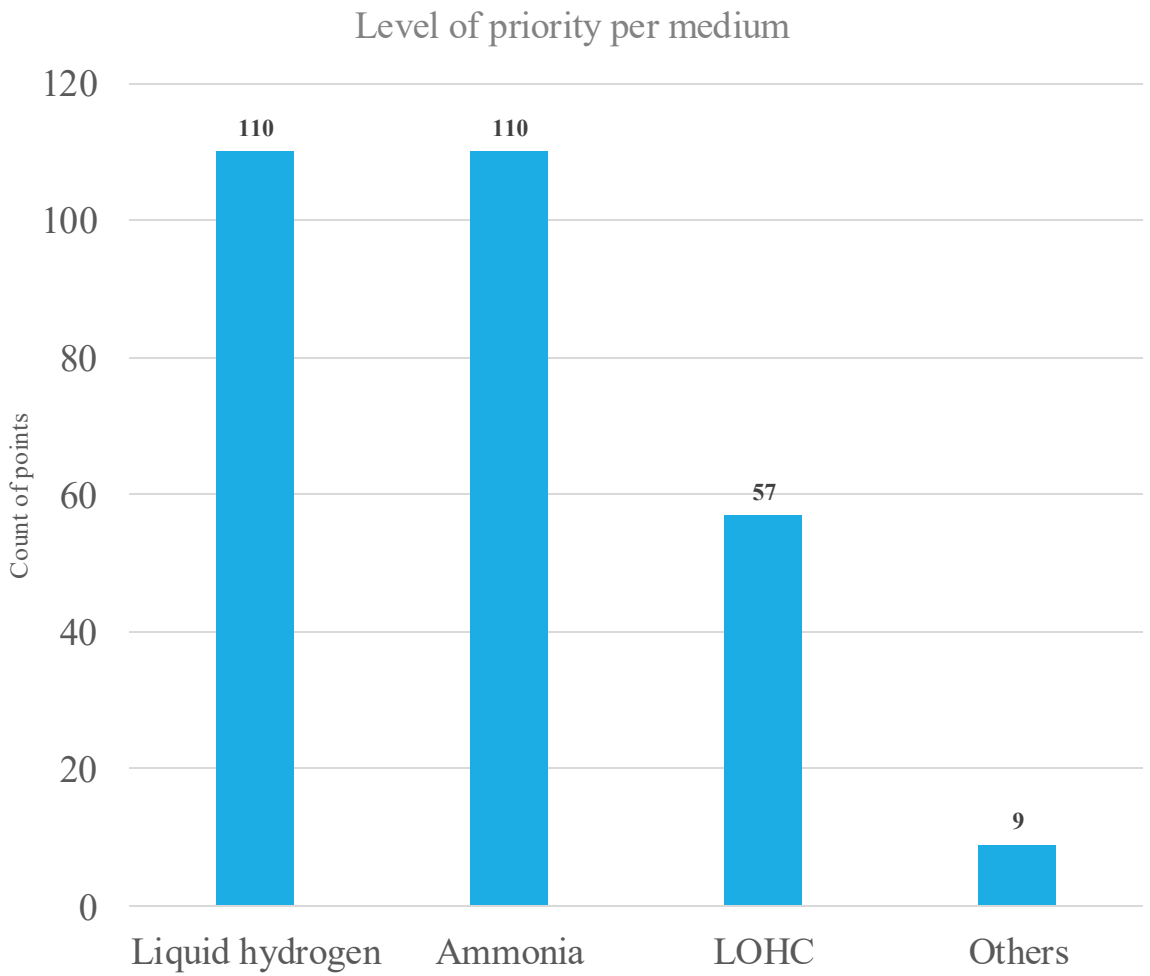
Preliminary Results - Percentage Ranked High by Countries

- Elements of the hydrogen value chain ranked high by most countries include:
  - **Terminals** for H2 and derivatives -Export/Import and Trans-shipment (83 %)
  - H2 and derivatives for **Seagoing Vessels** (83 %)
  - **Liquid hydrogen tankers** for export/import (67 %)
  - **Deep sea transportation** of liquid hydrogen and ammonia (67 %)
  - **Short sea transportation** of ammonia (67 %)



Initial Qualitative Trends

- Maritime transport of hydrogen
  - **Liquid hydrogen and ammonia** are front runners for maritime transport of hydrogen over LOHCs.
  - **Tankers** are prioritized for the maritime transport of hydrogen over deep sea and short sea transport.
  - **Maritime transport** of hydrogen is prioritized over port infrastructure, intermodal logistics and shipping fuels.



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Activity 2 – Maritime Case Studies

IPHE Maritime Task Force

Maritime TF Case Studies

As a next step, Maritime TF is collating case studies on projects detailing experience with regulations, codes and standards in maritime sector

Objectives

- Facilitate knowledge sharing among member states on their experience in maritime applications
- Offer an opportunity for IPHE member states to showcase hydrogen projects
- Derive commonalities in regulations, codes and standards from the case studies

Next step

- Seek member states' action to identify and reach out to maritime-related stakeholders to collate case studies (e.g. transport agencies, port regulators, maritime associations)
- Collect input with sufficient details to develop case studies (and visuals) based on template provided

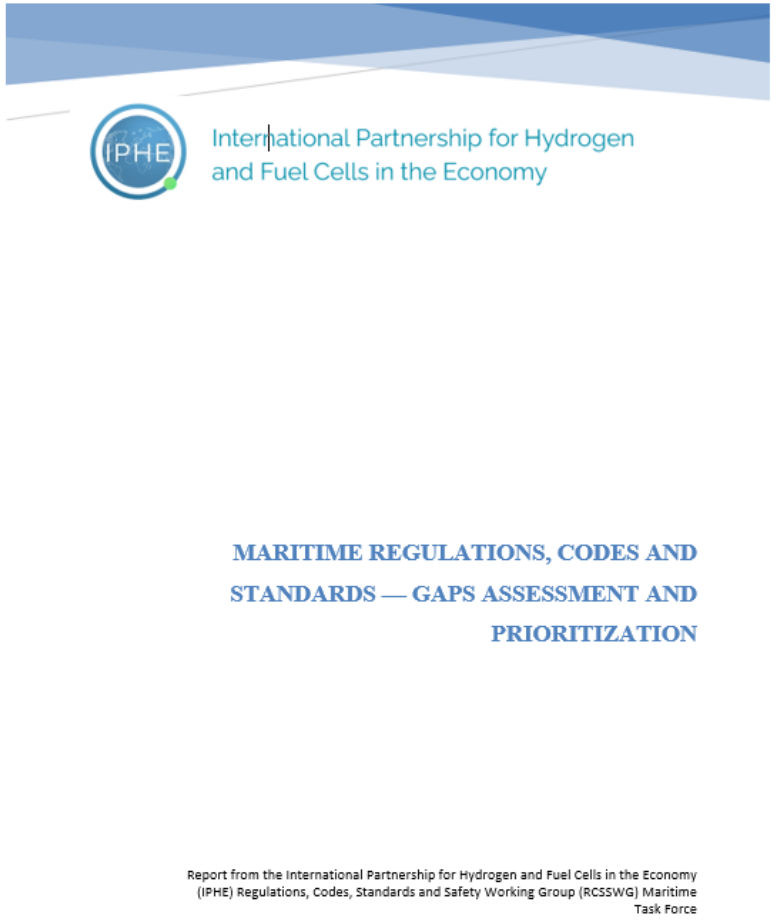
Maritime TF Report

Results and Dissemination

- Results from prioritization and case study will be presented in a report
- Targeting publication in 2026

How to Get Involved

- The IPHE Maritime Task Force is happy to involve new member states
- Reach out to your country representative and express your interest / send your case studies!



Thank you for your attention

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