Workstream – Decarbonization

WORKSTREAM – CURRENT TOPICS

The following presentation will highlight some of the efforts that took place in the GHG reduction stream. It does not cover each and every task, but instead answers some of the key questions posed in January 2023 during the Washington retreat.

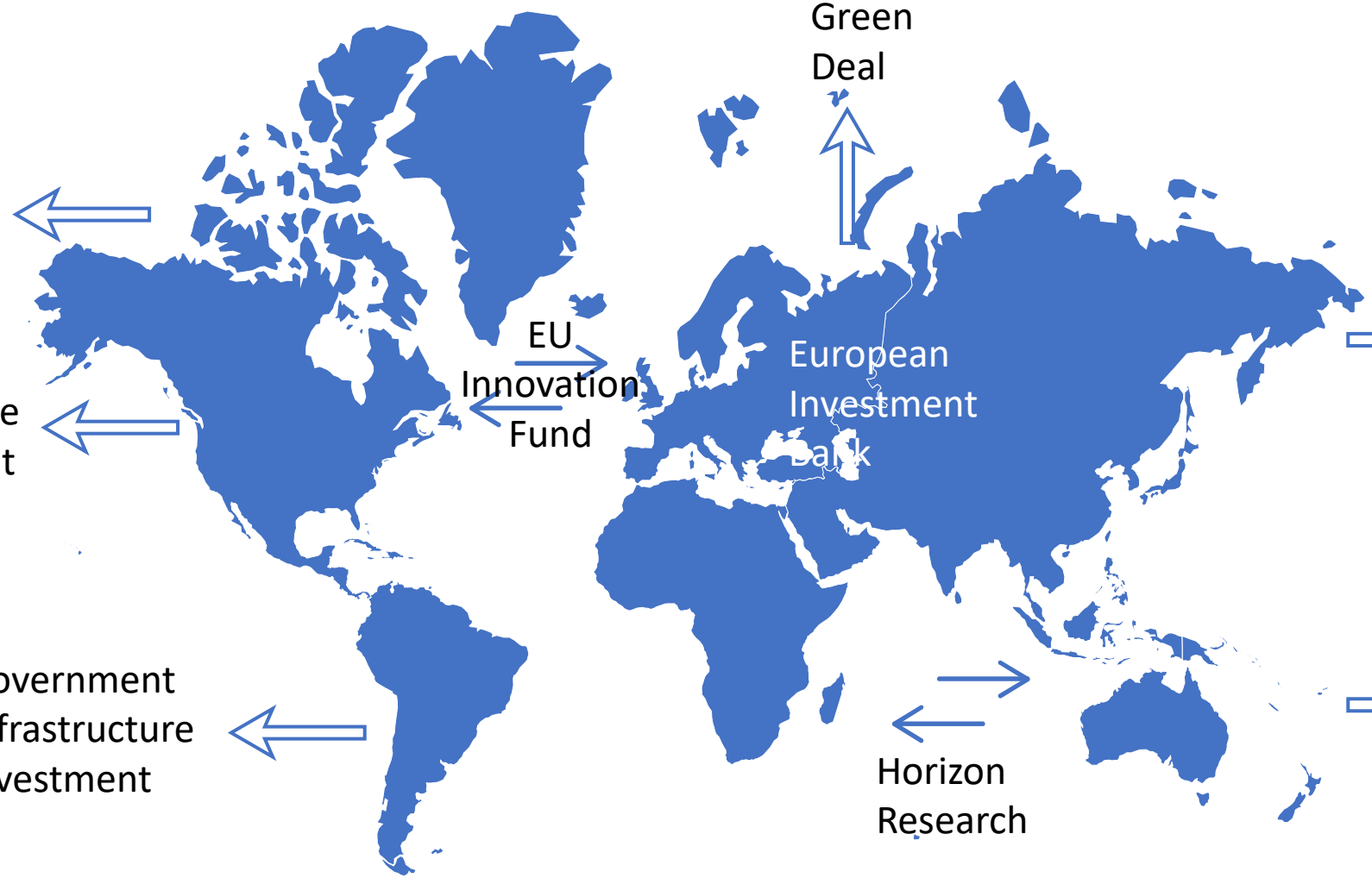
Funding / Fuel Choices in the Policy Framework / Onshore Power Supply / Sustainable Fuels / Trends

ASK

The cruise industry has an opportunity to channel public/private funds towards developing new green technologies and new infrastructure to benefit our sector.

- What has CLIA's monitoring revealed in each of the regions?
- What success has CLIA had advocating in the applicable jurisdictions, and with the financial stakeholders, to include cruising in the sustainability criteria used to assess green investments?
- What do we hope to accomplish by October?

HOW DOES FUNDING INTERACT - REGIONS



We should not treat funding as a regional task. Funding has an international political nature, focused on the economical interests of countries that work together on a set agenda..

What success has CLIA had advocating in the applicable jurisdictions, and with the financial stakeholders, to include cruising in the sustainability criteria used to assess green investments?

IMMEDIATE BIG-TICKET OPPORTUNITIES

The inclusion in Cruise in Emission Trading Systems, provides opportunities for revenue used for funding in unprecedented dimensions.

Funding Opportunities that are driven by revenue generated from Emission Trading Schemes (EU ETS, UK ETS, AUS ACCU…

40 Billion estimated in the EU alone; 9.9 Billion assumed to be dedicated to Maritime.

Q3 – Q4 /2023 FOCUS ON BIG TICKET OPPORTUNITIES

Action

- Must encourage Cruise Operators to apply for Innovation Fund funding call in November 2023 (till the end of Q1/2024)
- Establish a business case for US firms to access Innovation Fund through partnerships – focus on refitting current tonnage using new technology *(New Build can be accessed through shipyard)*
- Facilitate webinars and info papers on current availability of different options locally and internationally

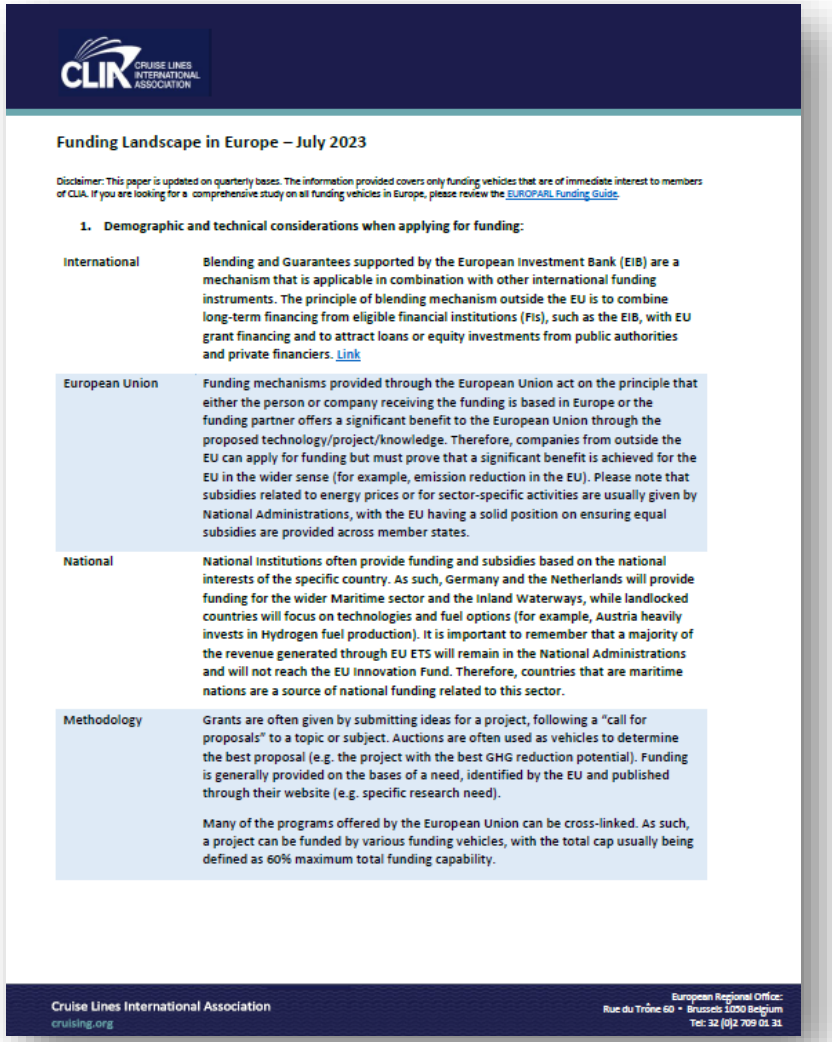
Research

- Australia – ACCU: how can we create ETS revenue through SSE
- New Zealand: Horizon Joint - Agreement
- Canada: Horizon (TBC)
- Europe – National Funding Opportunities from ETS
- USA – start research on local funding opportunities for SSE
- South America – Infrastructure Investment from GOV

NEXT STEP´S

Regional Funding Overview

- Quarterly Update
- Maritime Focus
- Interlink between the Operation and Registration of the Company



CLIA CRUISE LINES INTERNATIONAL ASSOCIATION

Funding Landscape in Europe – July 2023

Disclaimer: This paper is updated on quarterly bases. The information provided covers only funding vehicles that are of immediate interest to members of CLIA. If you are looking for a comprehensive study on all funding vehicles in Europe, please review the EUROPARL Funding Guide.

1. **Demographic and technical considerations when applying for funding:**

International	Blending and Guarantees supported by the European Investment Bank (EIB) are a mechanism that is applicable in combination with other international funding instruments. The principle of blending mechanism outside the EU is to combine long-term financing from eligible financial institutions (FIs), such as the EIB, with EU grant financing and to attract loans or equity investments from public authorities and private financiers. Link
European Union	Funding mechanisms provided through the European Union act on the principle that either the person or company receiving the funding is based in Europe or the funding partner offers a significant benefit to the European Union through the proposed technology/project/knowledge. Therefore, companies from outside the EU can apply for funding but must prove that a significant benefit is achieved for the EU in the wider sense (for example, emission reduction in the EU). Please note that subsidies related to energy prices or for sector-specific activities are usually given by National Administrations, with the EU having a solid position on ensuring equal subsidies are provided across member states.
National	National institutions often provide funding and subsidies based on the national interests of the specific country. As such, Germany and the Netherlands will provide funding for the wider Maritime sector and the Inland Waterways, while landlocked countries will focus on technologies and fuel options (for example, Austria heavily invests in Hydrogen fuel production). It is important to remember that a majority of the revenue generated through EU ETS will remain in the National Administrations and will not reach the EU Innovation Fund. Therefore, countries that are maritime nations are a source of national funding related to this sector.
Methodology	Grants are often given by submitting ideas for a project, following a "call for proposals" to a topic or subject. Auctions are often used as vehicles to determine the best proposal (e.g. the project with the best GHG reduction potential). Funding is generally provided on the bases of a need, identified by the EU and published through their website (e.g. specific research need). Many of the programs offered by the European Union can be cross-linked. As such, a project can be funded by various funding vehicles, with the total cap usually being defined as 60% maximum total funding capability.

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Rue du Trône 60 - Brussels 1050 Belgium
Tel: 32 (0)2 709 01 31

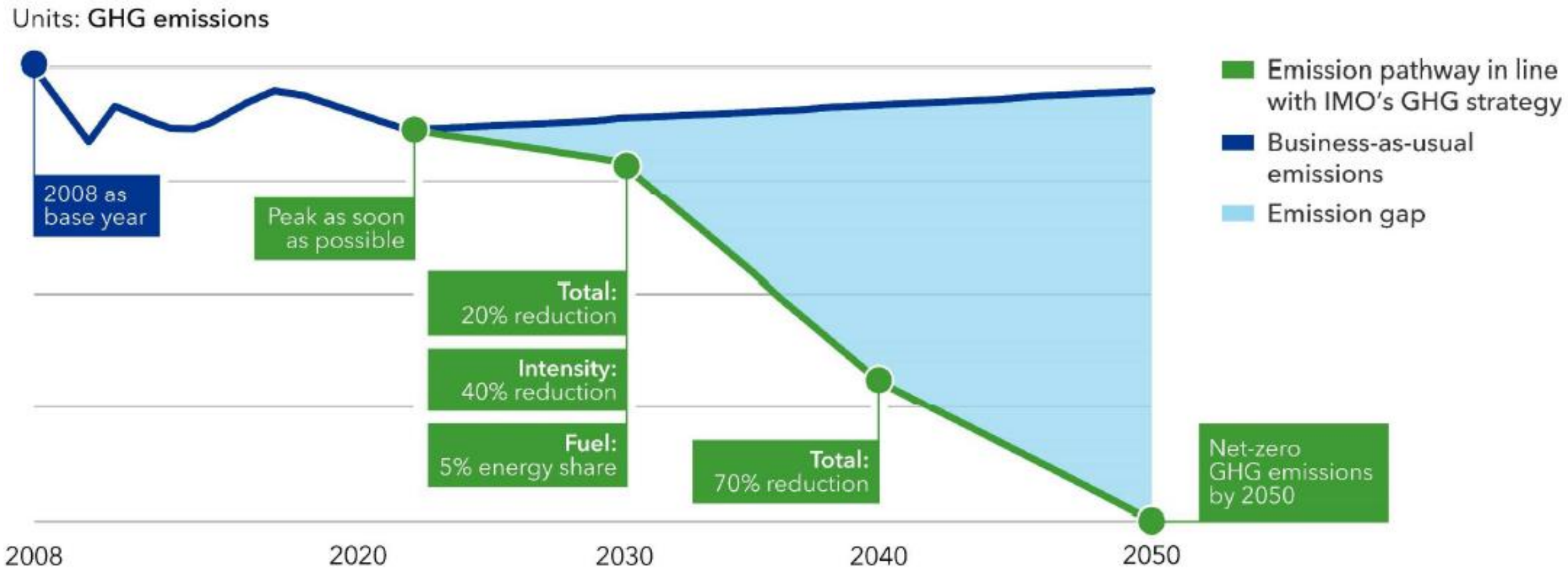
⇒ CLIA has shaped access for a potential 9.9 Billion Fund; now, we need to ensure our members can access this fund, are willing to apply and know how to apply;

ASK

Advocating for cruise line fuel choices to be included in policy frameworks is critical as the year 2025 quickly approaches and various pieces of legislation will be implemented around this time.

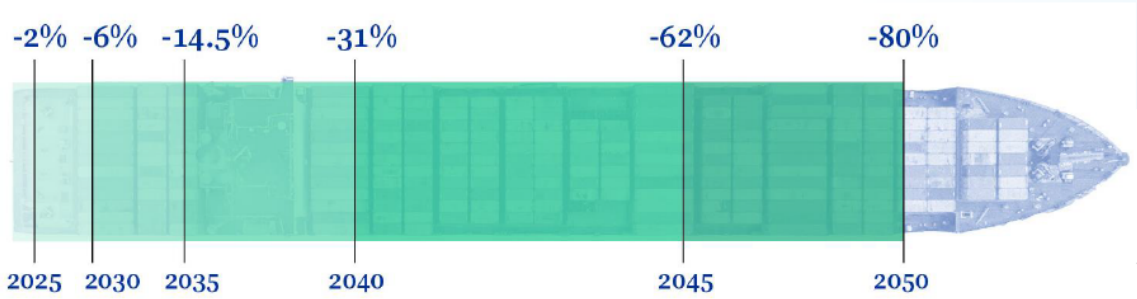
- What progress has been made thus far at IMO, within the EU, and elsewhere?
- Are there any examples where CLIA's efforts have helped minimize operational and financial burdens for our member cruise lines, particularly as it relates to CII, SSE, sustainable fuels and funding innovation?

IMO PATHWAY



Total: Well-to-wake GHG emissions; **Intensity:** CO_2 emitted per transport work; **Fuel:** Uptake of zero or near-zero GHG technologies, fuels and/or energy sources

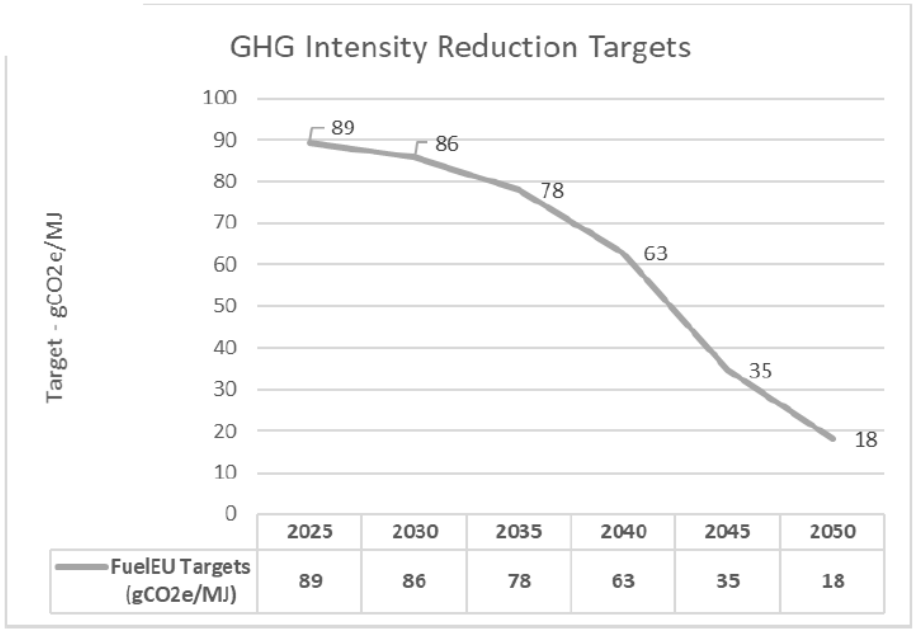
EU PATHWAY



FuelEU Maritime
GHG Intensity Target

- **General targets**: Establishes limits on the annual average GHG intensity of the energy used on-board. **Reference value: 91.16 g CO_2eq/MJ**.

- Ref Value:
  - Calculated based on 2020 MRV fleet data
  - LNG fuelled fleet considered
  - Fuel Mix as per MRV reported fuel consumption



European Commission | Mobility and Transport

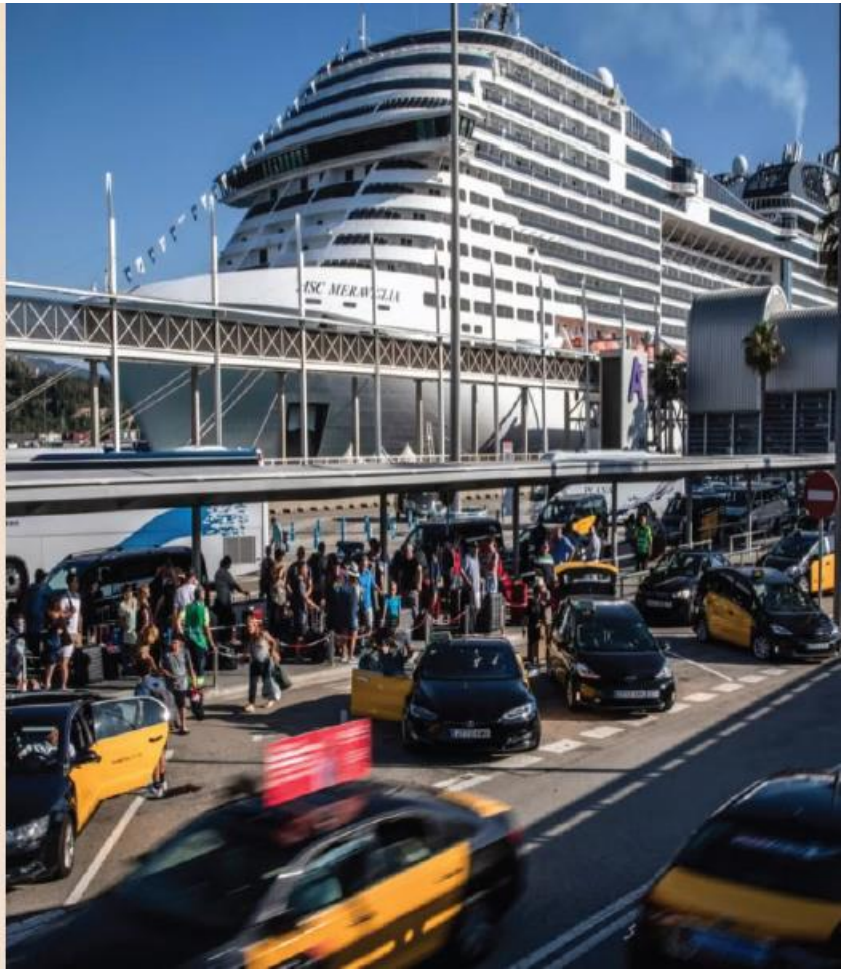
NGO PATHWAY

There is little acceptance between a realistic 25-year decarbonisation pathway and the need to “act now” (focus on political opinion)

Pollution ✓ Added

Cruise ships pollute Europe’s port cities despite emissions curbs

Research shows harmful gases from vessels quadruple that of cars as campaigner says people are ‘choking on toxic air’



Are there any examples where CLIA's efforts have helped minimize operational and financial burdens for our member cruise lines, particularly as it relates to CII, SSE, sustainable fuels and funding innovation?

FINANCIAL BURDEN

- SSE at anchorage
- Blue Flag agreements / French Charter
- CII alternative Calculation
- Maritime Safety Act / CII / EGCS
- Inclusion of Maritime in Net Zero Act
- Dedicated maritime call in Innovation Call
- Cruise as part of ETS
- AFIR / SSE

One of the key challenges that we face is the definition of a "realistic timeline" in the view of the cruise operator, the legislator, the local population at port and the NGO.

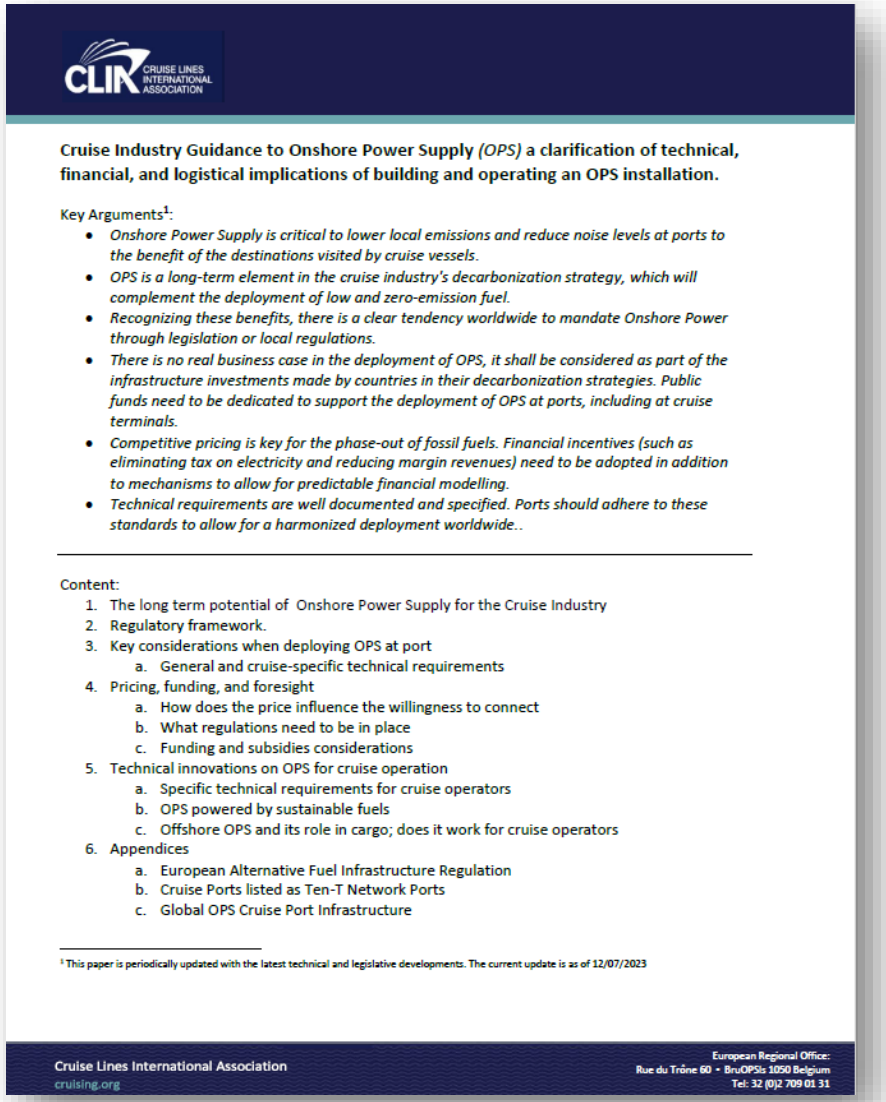
ASK

By 2030, all key ports in the European Union will have to offer **SSE** with the obligation for operators to connect to these facilities, whilst emission-free docking is poised to happen in most Tier One ports worldwide within the years 2030 to 2035.

- Where/how has CLIA successfully communicated the urge for ports to invest and/or facilitated the conversation around funding?
- What is the status of the SSE mapping project?

COMMUNICATION

- Content: SSE paper / Technical specification
- Event: FEUM Paris / Ports and Destination Dialogue Hamburg / Decarbonization Forum / Policy Breakfast / Seatrade
- Database for all technical connections for ships
- Specific Port Engagement (CAN/US/AUS/EU)



CLIA CRUISE LINES INTERNATIONAL ASSOCIATION

Cruise Industry Guidance to Onshore Power Supply *(OPS)* a clarification of technical, financial, and logistical implications of building and operating an OPS installation.

Key Arguments[1]:

- *Onshore Power Supply is critical to lower local emissions and reduce noise levels at ports to the benefit of the destinations visited by cruise vessels.*
- *OPS is a long-term element in the cruise industry's decarbonization strategy, which will complement the deployment of low and zero-emission fuel.*
- *Recognizing these benefits, there is a clear tendency worldwide to mandate Onshore Power through legislation or local regulations.*
- *There is no real business case in the deployment of OPS, it shall be considered as part of the infrastructure investments made by countries in their decarbonization strategies. Public funds need to be dedicated to support the deployment of OPS at ports, including at cruise terminals.*
- *Competitive pricing is key for the phase-out of fossil fuels. Financial incentives (such as eliminating tax on electricity and reducing margin revenues) need to be adopted in addition to mechanisms to allow for predictable financial modelling.*
- *Technical requirements are well documented and specified. Ports should adhere to these standards to allow for a harmonized deployment worldwide..*

Content:

1. The long term potential of Onshore Power Supply for the Cruise Industry
2. Regulatory framework.
3. Key considerations when deploying OPS at port
   a. General and cruise-specific technical requirements
4. Pricing, funding, and foresight
   a. How does the price influence the willingness to connect
   b. What regulations need to be in place
   c. Funding and subsidies considerations
5. Technical innovations on OPS for cruise operation
   a. Specific technical requirements for cruise operators
   b. OPS powered by sustainable fuels
   c. Offshore OPS and its role in cargo; does it work for cruise operators
6. Appendices
   a. European Alternative Fuel Infrastructure Regulation
   b. Cruise Ports listed as Ten-T Network Ports
   c. Global OPS Cruise Port Infrastructure

[1] This paper is periodically updated with the latest technical and legislative developments. The current update is as of 12/07/2023

Cruise Lines International Association
cruising.org

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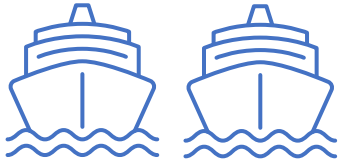
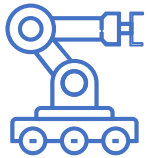
DESPITE THE GENERAL INTEREST IN SSE, THERE ARE SEVERAL PITFALLS THAT NEED TO BE CONSIDERED…

Green Electricity: currently, the European Union is focused on getting the installations done; the greening of the electricity sector is another task that should not impact the argument or decision for SSE;

Pricing: remains a significant concern when considering alternative energy; however, considering the energy density, availability and transport of electricity as a key advantage, it can be thought that in the long run, such will remain competitive;



Quantity: single installations of SSE remain a good initial practice, however having multiple ships in port means that all vessels must have access to SSE connections; consider the maximum number of vessels per day / electricity need;



Modular and flexible design: as vessel sizes, shapes and connections differ, a flexible design that can be moved across different areas or at least along the entire length of the vessel is preferred; consider that initial connecting should not take longer than 60 minutes;

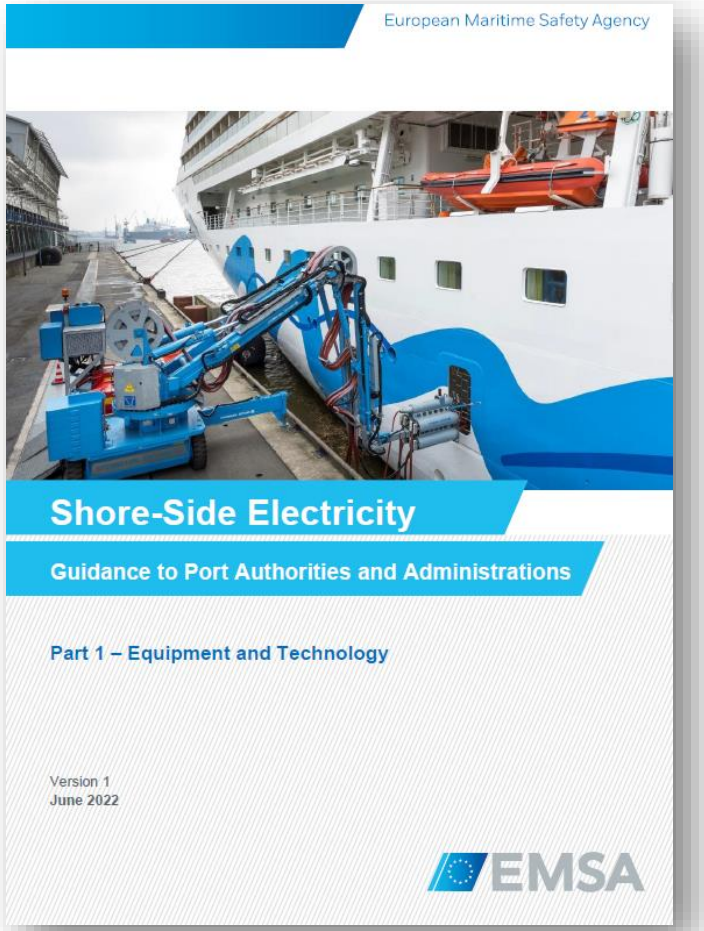
DEBUNKING THE MYTH (WILL SSE STILL PLAY A ROLE IN 2050)

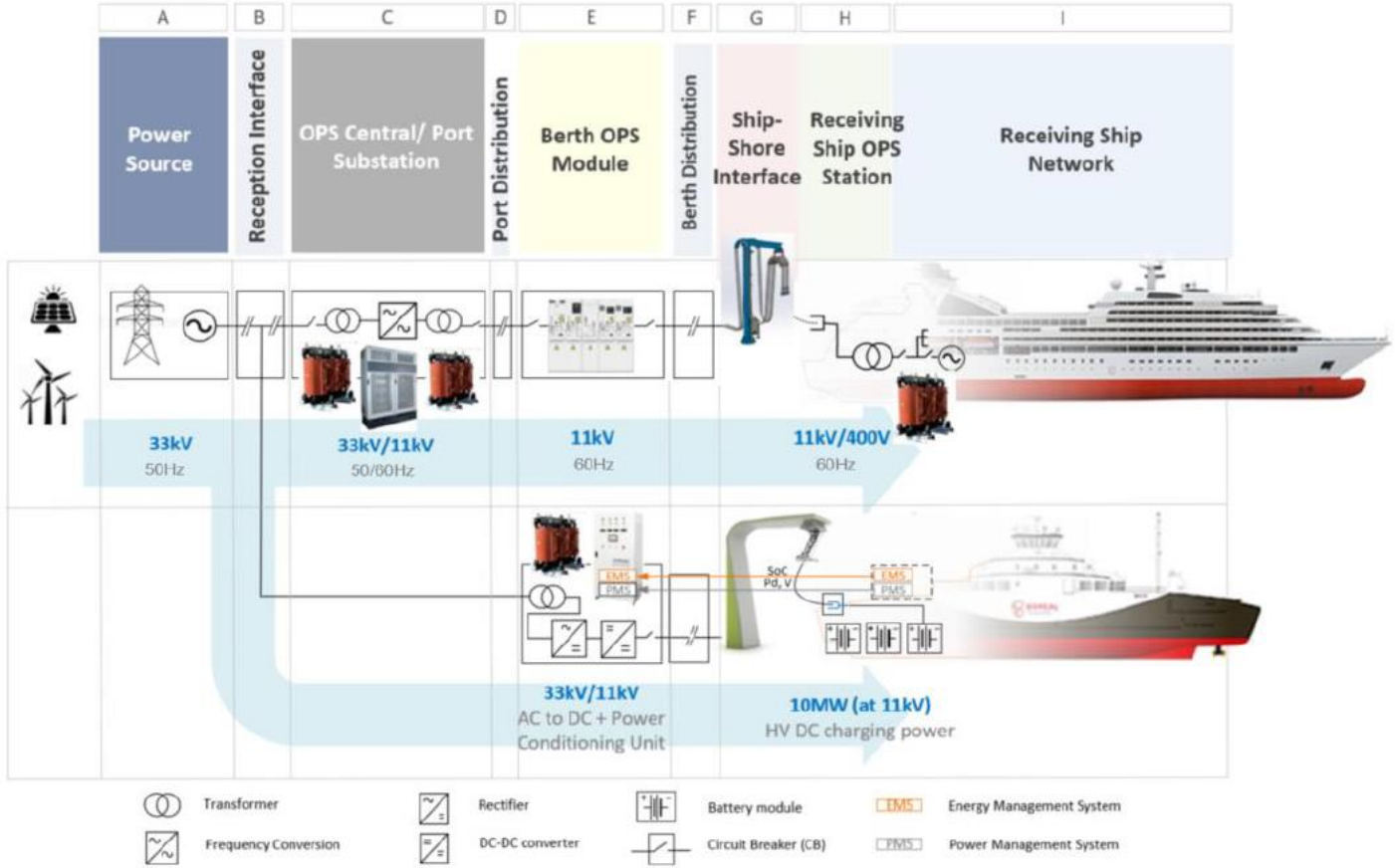
SSE will be a viable solution when at Dock

"The time a vessel is on SSE is crucial to stockpile other low emission fuels for sailing times"

Alternative fuel options will focus on Sailing

DEBUNKING THE MYTH (DO WE KNOW ABOUT THE TECHNICAL REQUIREMENTS)





SHORE-SIDE ELECTRICITY-CONNECTIVITY (SSEC)

Hapag Lloyd Cruises			Mein Schiff	
EUROPA 2	**HANSEATIC-class**		***Mein Schiff 1* – class (preliminary)**	***Mein Schiff 3-6* - class**
Schneider Electric	IMESA, MINIVER/C	**Manufacturer of HV shore connection (Maker, Type)**	ABB UniGear	ABB UniGear
IEC/IEEE 80005-1	IEC/IEEE 80005-1	**Norm / standard of HV shore connection**	IEC/IEEE 80005-1	IEC/IEEE 80005-1
6,6 kV	6,6 kV	**Voltage**	11 kV	11 kV
60 Hz	60 Hz	**Frequency**	60 Hz	60 Hz
7,500 kVA	2,500 kVA	**Power**	17,500 kVA	17,500 kVA
2,500 kVA	1,000 kVA	**Min. power required during port stay**	3,500 kVA	4,600 kVA
2.5 to 3.3 MW	0.75 to 1.25 MW	**Power consumption (average amount of power needed by the ship)**	4 MW	4 MW
		Power consumption (maximum amount of power needed by the ship)	5.5 MW	6 MW
1x starboard side	1x starboard side	**No + position of connection**	1 x port side	1x port side
75 m	59 m	**Distance from stern**	67 m	62 m
3.50 m	0.75 m	**Height of door at WL**	3.77 m	2.8 m
1,800 * 1,000 mm	1,000 * 2,000 mm	**Door size (h & w)**	1,220 x 915 mm	1,220 mm * 800 mm
4 m	5 m	**Distance shore panel to hull**	1.953 m	1.8 m
Cable to be supplied from shoreside		**Cable connection**	Cable to be supplied from shoreside	

PORTS WITH ONSHORE POWER SUPPLY FOR CRUISE SHIPS: ACTIVE, FUNDED, OR PLANNED

ACTIVE	FUNDED	PLANNED
37	8	18

ACTIVE

1 **AUSTRALIA** Sydney
3 **CANADA** Halifax, NS | Montreal, QC
Vancouver, BC
4 **CHINA** Qingdao | Shanghai | Shenzhen | Xiamen
1 **DENMARK** Aarhus
1 **FINLAND** Turku
1 **FRANCE** Le Havre
3 **GERMANY** Hamburg-Altona | Kiel
Rostock-Warnemünde
1 **ICELAND** Hafnarfjordur
1 **ITALY** Genoa
1 **LATVIA** Ventspils
6 **NORWAY** Ålesund | Bergen | Flåm |Karmsund
Kristiansan | Trondheim
1 **SOUTH KOREA** Incheon
4 **SWEDEN** Lyngdal | Skjolden-Sogenfjord | Stockholm
Verkö
1 **UK** Southampton
8 **USA** Brooklyn, NY | Juneau, AK
Long Beach, CA | Los Angeles/San Pedro, CA
Oakland, CA | San Diego, CA | San Francisco, CA
Seattle, WA

FUNDED

1 FRANCE Marseille
2 ITALY Civitavecchia | Livorno
2 NORWAY Stavanger | Tromsø
1 SPAIN Cadiz
1 SWEDEN Ystad
1 USA Miami, FL

PLANNED

1 **ESTONIA** Tallinn
2 **FRANCE** Nice | Toulon
1 **GERMANY** Bremen
1 **GREECE** Heraklion
1 **ITALY** La Spezia
1 **MALTA** Valetta
2 **NETHERLANDS** Amsterdam | Rotterdam
2 **NORWAY** Haugesund | Oslo
3 **SPAIN** Barcelona | Bilbao | Valencia
2 **UK** Portsmouth | Tyne
1 **USA** Fort Lauderdale, FL

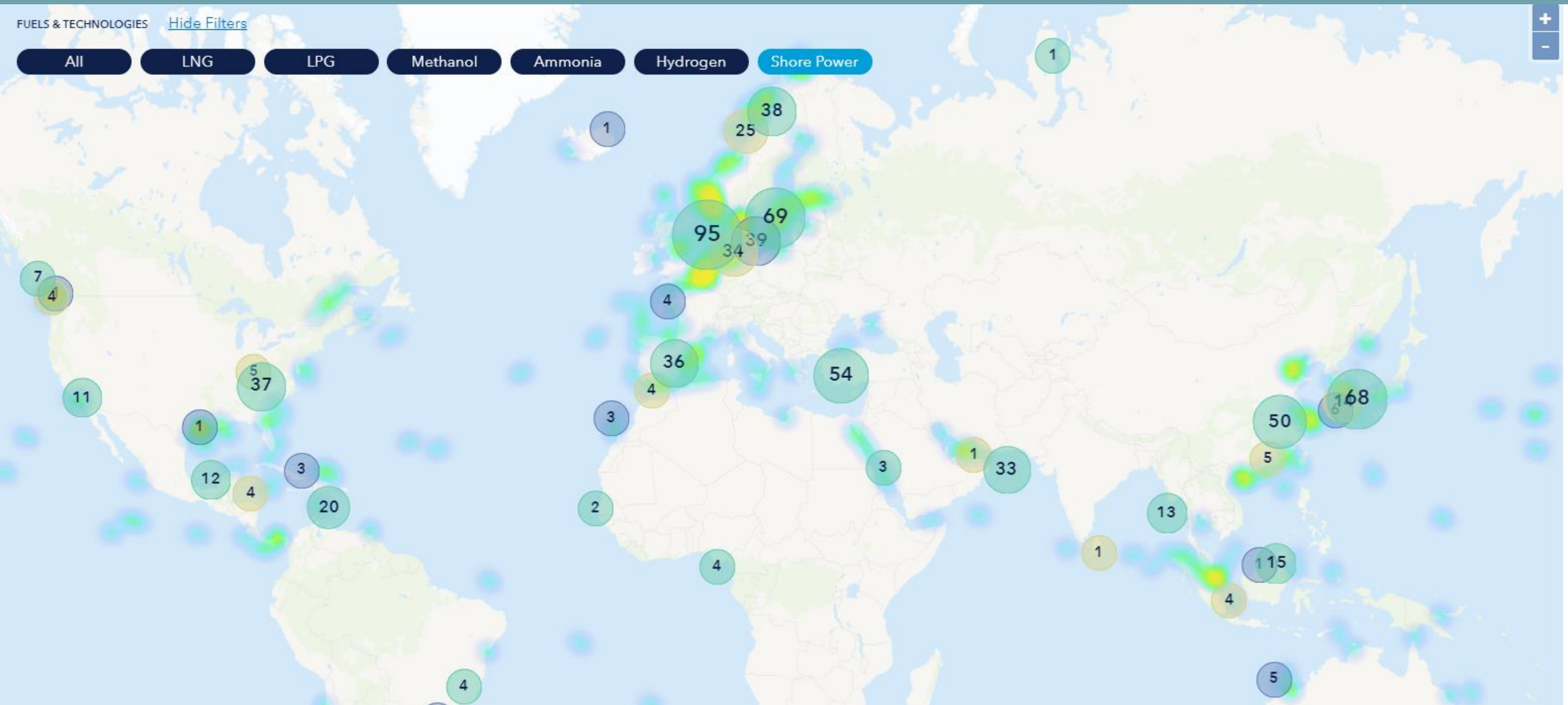
AS OF 15 JUNE 2023

Cruising.org
#WeAreCruise
CruiseInfoHub.com

Onshore Power allows ships to plug-in at berth and shut off engines--resulting in significant reductions in emissions.

SAMPLE (DNV)

Source: DNV 2023



SSE – MAPPING

Current

- CLIA Database
- Med Cruise Database
- Cruise Europe Database
- DNV Infrastructure Database

Next Steps

- Engage with EMSA to create a framework database for Cruise Infrastructure
- Keep CLIA database running until a global version is launched by “an official government body”

ASK

In terms of **Sustainable Fuels,** please provide an update on the following items shared with the GEC at the end of February:

- Establish that public and private funding for the deployment of renewables is included in the maritime infrastructure and, more specifically, the scope of the cruise sector.
- Secure a favourable regulatory framework to incentivise production (through financial incentives and multiplier mechanisms), deployment (inclusion of port fuel infrastructure in national plans), and use (zero rating of renewable fuels in ETS / CII) for sustainable marine fuels.
- Create an **inventory of alternative fuels and innovative technologies** that support our pursuit of net-zero by 2050 goals.

Establish that public and private funding for the deployment of renewables is included in the maritime infrastructure and, more specifically, the scope of the cruise sector.

FUNDING OVERVIEW (MULTIPLYING OPTIONS TO COVER ALL ELEMENTS)

- *Invest EU Programme – Research, Innovation, SMEs, Social Investment and skills (**Ten-T network**, Inland Waterways, Alternative Fuel Infrastructure, Renewal and Retrofitting)*

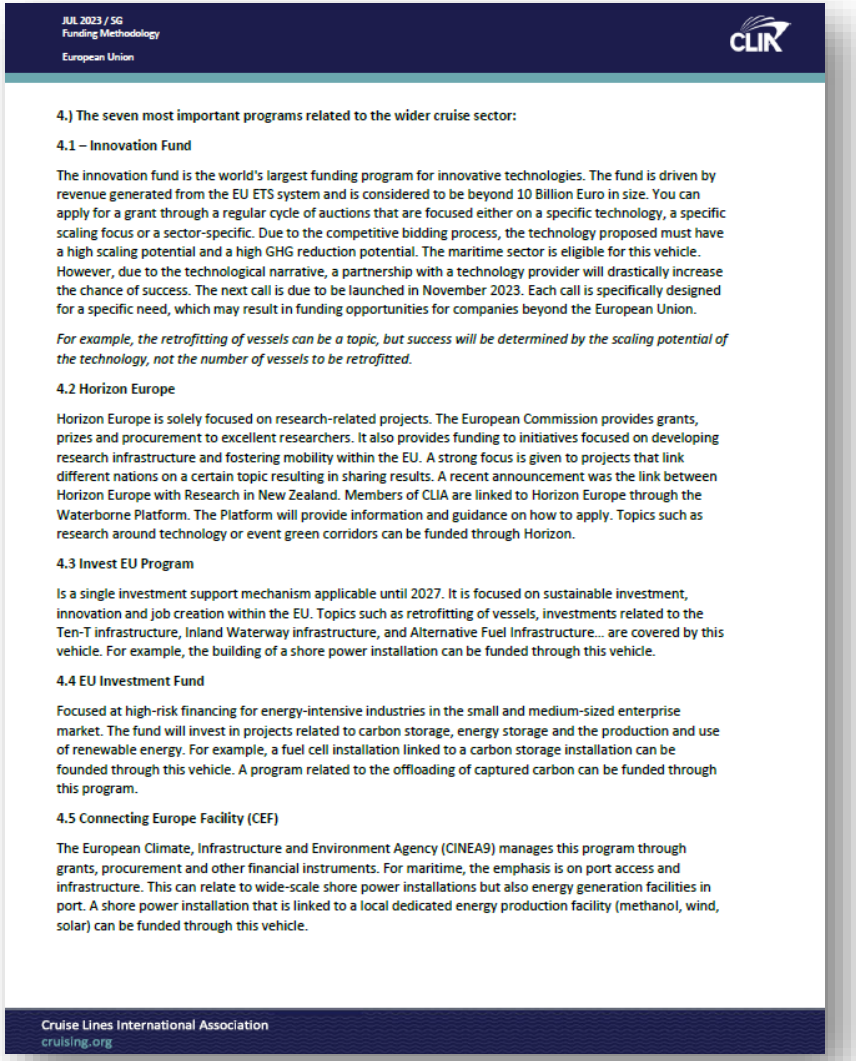
- *EU Investment Fund – Energy Intensive industries (carbon storage, energy storage, **production and use of renewable energy**)*

- *CEF (CINEA) – focus on port access and* infrastructure (**Shoreside electricity,** energy generation in port)

- AFIF – Alternative Fuel Infrastructure (hydrogen, **SSE including Grid to shore**)

- *EIB – European Investment Bank (Lending, Blending, **Advisory**)*

- *Horizon Europe – Waterborne Platform (**research**-focused)*



JUL 2023 / SG
Funding Methodology
European Union

4.) The seven most important programs related to the wider cruise sector:

4.1 – Innovation Fund

The innovation fund is the world's largest funding program for innovative technologies. The fund is driven by revenue generated from the EU ETS system and is considered to be beyond 10 Billion Euro in size. You can apply for a grant through a regular cycle of auctions that are focused either on a specific technology, a specific scaling focus or a sector-specific. Due to the competitive bidding process, the technology proposed must have a high scaling potential and a high GHG reduction potential. The maritime sector is eligible for this vehicle. However, due to the technological narrative, a partnership with a technology provider will drastically increase the chance of success. The next call is due to be launched in November 2023. Each call is specifically designed for a specific need, which may result in funding opportunities for companies beyond the European Union.

For example, the retrofitting of vessels can be a topic, but success will be determined by the scaling potential of the technology, not the number of vessels to be retrofitted.

4.2 Horizon Europe

Horizon Europe is solely focused on research-related projects. The European Commission provides grants, prizes and procurement to excellent researchers. It also provides funding to initiatives focused on developing research infrastructure and fostering mobility within the EU. A strong focus is given to projects that link different nations on a certain topic resulting in sharing results. A recent announcement was the link between Horizon Europe with Research in New Zealand. Members of CLIA are linked to Horizon Europe through the Waterborne Platform. The Platform will provide information and guidance on how to apply. Topics such as research around technology or event green corridors can be funded through Horizon.

4.3 Invest EU Program

Is a single investment support mechanism applicable until 2027. It is focused on sustainable investment, innovation and job creation within the EU. Topics such as retrofitting of vessels, investments related to the Ten-T infrastructure, Inland Waterway infrastructure, and Alternative Fuel Infrastructure... are covered by this vehicle. For example, the building of a shore power installation can be funded through this vehicle.

4.4 EU Investment Fund

Focused at high-risk financing for energy-intensive industries in the small and medium-sized enterprise market. The fund will invest in projects related to carbon storage, energy storage and the production and use of renewable energy. For example, a fuel cell installation linked to a carbon storage installation can be founded through this vehicle. A program related to the offloading of captured carbon can be funded through this program.

4.5 Connecting Europe Facility (CEF)

The European Climate, Infrastructure and Environment Agency (CINEA9) manages this program through grants, procurement and other financial instruments. For maritime, the emphasis is on port access and infrastructure. This can relate to wide-scale shore power installations but also energy generation facilities in port. A shore power installation that is linked to a local dedicated energy production facility (methanol, wind, solar) can be funded through this vehicle.

Cruise Lines International Association
cruising.org

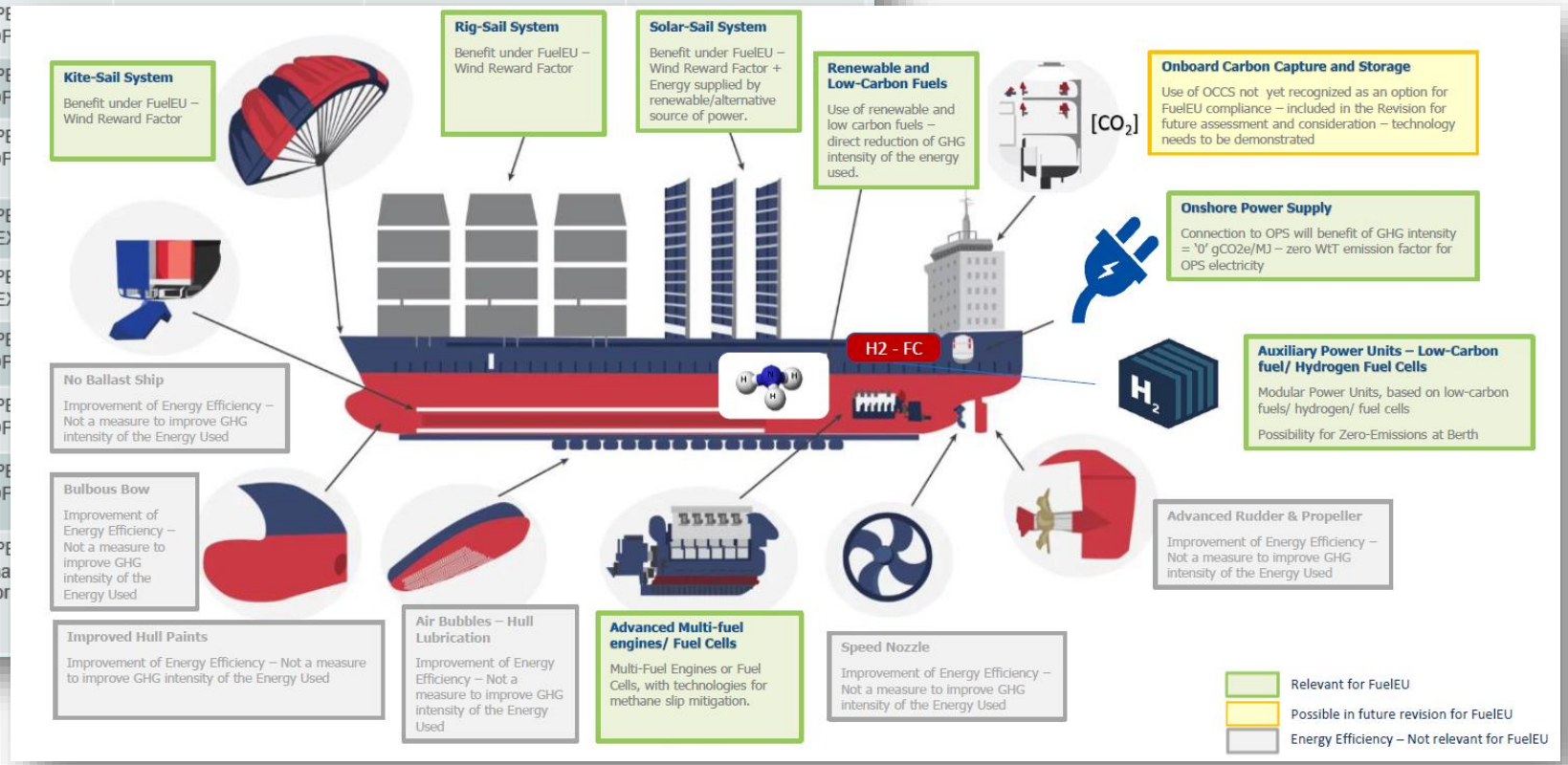
Establish that public and private funding for the deployment of renewables is included in the maritime infrastructure and, more specifically, the scope of the cruise sector.

FUNDING OVERVIEW (ENSURING TECHNOLOGICAL OPTIONS)

Type of support required

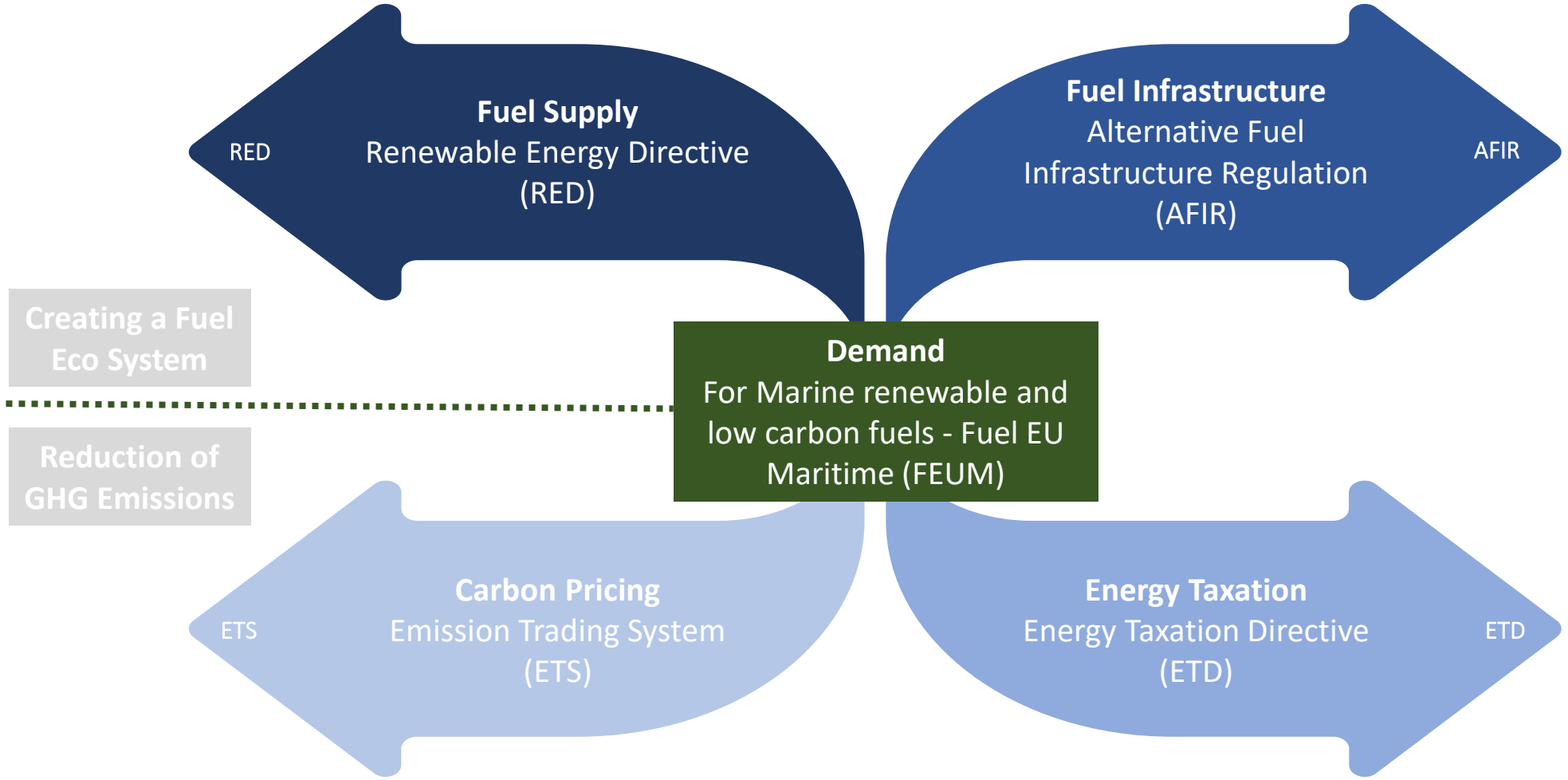
It is important to consider that multiple technologies may be installed on one ship – funding calls need to allow for a multitude of technologies on one vessel

Project	Type	CAPEX	OPEX	Vehicle
Onshore Power Supply installation for ship to shore electricity connection, recharging of batteries and wider energy grid connection	Grant for CAPEX Funding for OPEX	Installation and grid infrastructure	Tax restriction on electricity	Innovation Fund CEF / AFIF
Refitting or New Building of vessels with multi fuel engines	Grant for CAPE Funding for OP			
Battery Technology – Electrical Storage	Grant for CAPE Funding for OP			
Fuel Cell Development and Deployment	Grant for CAPE Funding for OP			
Carbon Capture, Usage and Storage	Grant for CAPE Grant for OPEX			
Energy Efficiency / Digitalization	Grant for CAPE Grant for OPEX			
Port Infrastructure and equipment (Bunkering of renewable fuels, deployment of smart and efficient refueling solutions)	Grant for CAPE Funding for OP			
Vessel design (including safety aspects due to new fuel, hull design, energy density and distribution requirements)	Grant for CAPE Funding for OP			
Waste to Energy	Grant for CAPE Funding for OP			
Increasing production of low and zero carbon fuels dedicated to the maritime sector	Grant for CAPE Auction Mecha as Contract for Difference)			



Secure a favourable regulatory framework to incentivise production (through financial incentives and multiplier mechanisms), deployment (inclusion of port fuel infrastructure in national plans), and use (zero rating of renewable fuels in ETS / CII) for sustainable marine fuels.

Legislation – How do the different Regulations Interact?



Complimentary

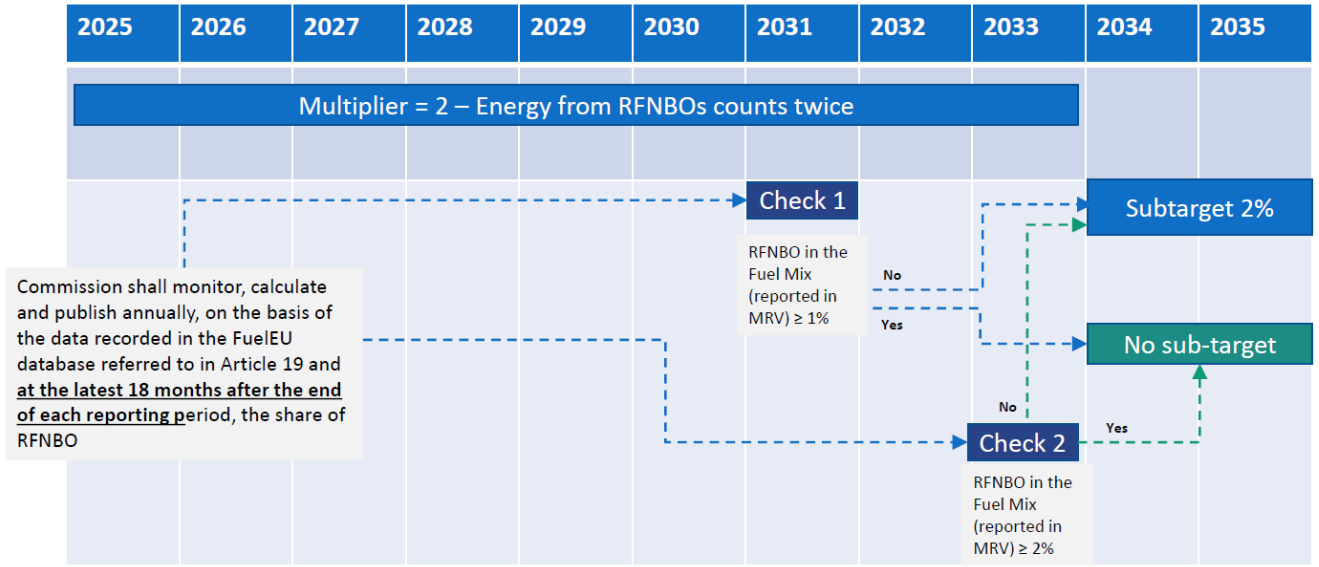
- ETS promotes energy saving while FuelEU addresses fuel technology
- RED addresses fuel demand – supply focus
- AFIR addresses fuel demand – distribution focus
- ETD addresses taxation levels for renewable and low carbon fuels and for electricity at berth

Secure a favourable regulatory framework to incentivise production (through financial incentives and multiplier mechanisms), deployment (inclusion of port fuel infrastructure in national plans), and use (zero rating of renewable fuels in ETS / CII for sustainable marine fuels.

MULTIPLIER AND ZERO RATING

RFNBOs: RFNBO multiplier of 2 from 2025-2033 + if RFNBO share in the maritime fuel mix is less than 1% in 2031 → RFNBO subtarget of 2 % will kick in from 2034.

FuelEU Maritime
RFNBOs – Promotion Measures



European Commission | Mobility and Transport

9

EU → IMO ←

Agreement in principle on new GHG Measures

- Technical measure: **GHG intensity fuel standard**:
  - Regulating the phased reduction of fuel well-to-wake GHG intensity
  - Separate proposals from EU and China could form the design basis
- Economic element: a **price on GHG emissions**
  - No agreement on pricing mechanism, but could potentially be linked directly to the GHG intensity fuel standard
- **Timeline**
  - Adoption in 2025, Entry into Force in 2027

Secure a favourable regulatory framework to incentivise production (through financial incentives and multiplier mechanisms), deployment (inclusion of port fuel infrastructure in national plans), and use (zero rating of renewable fuels in ETS / CII) for sustainable marine fuels

IMO OUTCOMES

Fuel lifecycle (LCA) guidelines adopted

- Key content:
  - **Methods for calculating** well-to-wake and tank-to-wake GHG emissions – grams CO_2e per MJ
  - **Sustainability topics/aspects**
  - **Defines a Fuel Lifecycle Label (FLL)** that specify the information relevant for the life cycle assessment.
  - Preliminary **default emissions factors** for various fuels and fuel pathways
- **No provisions for application** or requirements – intended to support the GHG Fuel Standard
- **To be developed further** in the coming years:
  - Default emissions factors; sustainability criteria; fuel certification; handling of on-board carbon capture

Use of biofuels under DCS and CII regulations

- Biofuels can use a CO_2 conversion factor equal to the well-to-wake GHG emissions factor if they:
  - Are **certified** by an international certification scheme
  - Meet their **sustainability criteria**
  - Provide a **well-to-wake GHG emissions reduction of at least 65%** compared to fossil MGO
- **Temporary,** until regulations apply the methods in the LCA guidelines.

Carbon Intensity Indicator (CII) review

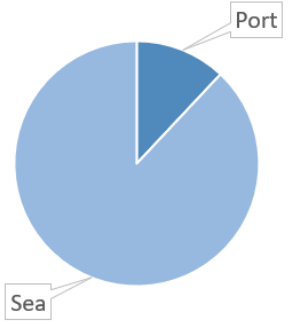
- **Phased approach** agreed
  - **Data-gathering** phase until MEPC 82, autumn 2024
  - **Data analysis and potential amendments** to the CII by MEPC 83, summer 2025
- **No immediate changes to the CII framework**
  - This includes correction factors and voyage adjustments
  - Potential **amendments in 2025** include:
    - CII **reduction requirements** from 2026 to 2030 to be aligned with the revised GHG Strategy ambitions
    - **Correction factors** and/or additional metrics
    - Revised **enforcement** mechanism
    - Application of **LCA guidelines**

CSSF WAS INSTRUMENTAL TO START THE JOURNEY ON AN ALTERNATIVE CII CALCULATION

Current CII Metric: Challenges

- Cruise ships do not function purely as a form of transportation and are designed to provide a complete vacation experience to passengers.
  - A significant portion of generated power is devoted to hotel services
- Cruise ships spend a significant amount of time in port annually to allow passengers to disembark and spend time in destinations.
- Analyses have shown that ships with long port stays achieve worse CII values, *even if total emissions are lower*
- **Ships may emit more absolute emissions in pursuit of better attained CII values.**

Example Cruise Ship Annual Energy Breakdown



CSSF
CRUISE SAFETY AND SUSTAINABILITY FORUM

$$CII_{alt} = \frac{M}{GT * h}$$

M	Total mass of annual CO_2 emissions in grams
GT	Gross tonnage
h	Annual hours in service (typically 8760)

Create an **inventory of alternative fuels and innovative technologies** that support our pursuit of net-zero by 2050 goals.

INVENTORY OF SUSTAINABLE FUELS INFRASTRUCTURE

RLCF Alliance

WS Commercial Pipeline

July 2023

Sascha Gill

Definition of the RLCF Alliance project pipeline

RLCF Alliance

Objectives:

- Inform
- Identify gaps in value chain and geography
- Facilitate investment decisions
- Facilitate vertical business matchmaking and with possible investors
- Test the strategic coherence with the RLCF Value Chain Alliance objectives (i.e. relevance for the European sustainable fuels value chain creation)

Constraints:

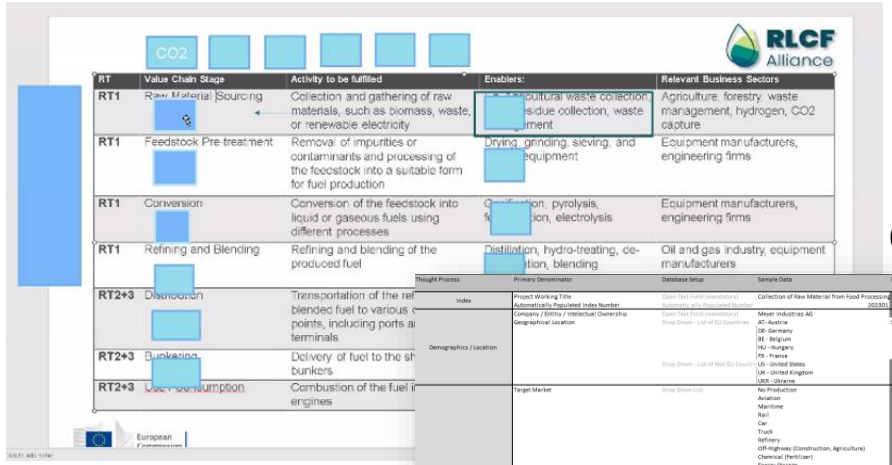
- Limited willingness/authorizations to share information
- Strict anti-trust laws
- No direct connection with public financing
- No mandate to screen projects

Way forward:

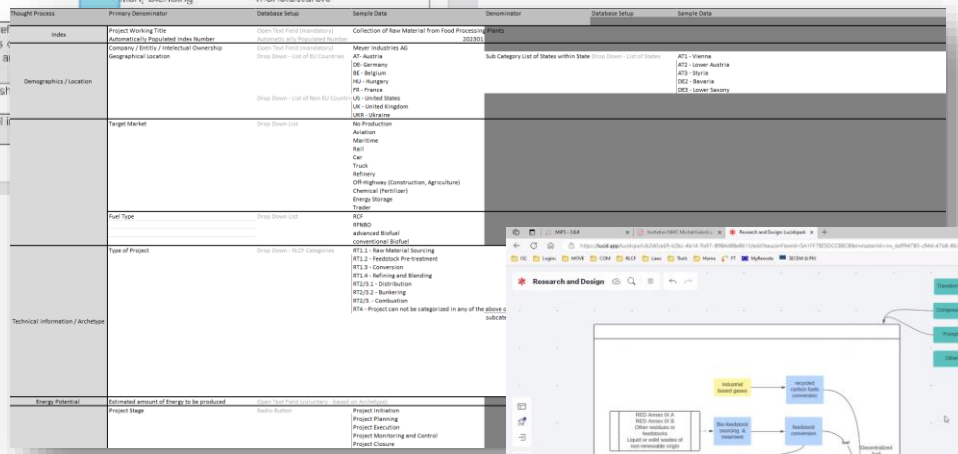
- Identify possible criteria for selection (archetypes see hereafter)
- Launch "selection process"
- Public Database with limited information demands
- Targeted Matchmaking sessions

Input from RT3 on Commercial Pipeline – Architecture

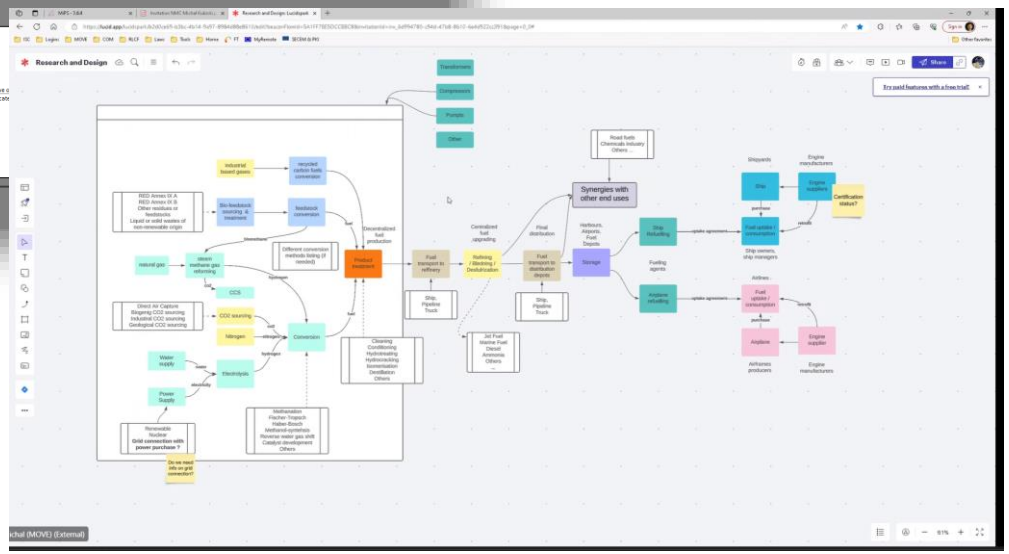
Basic Concept



Conceptual Framework



Architecture Workflow



Whilst our liaison to RSB is focused on the certification process, the RLSC alliance is crucial for the database creation

Next Step: Programming

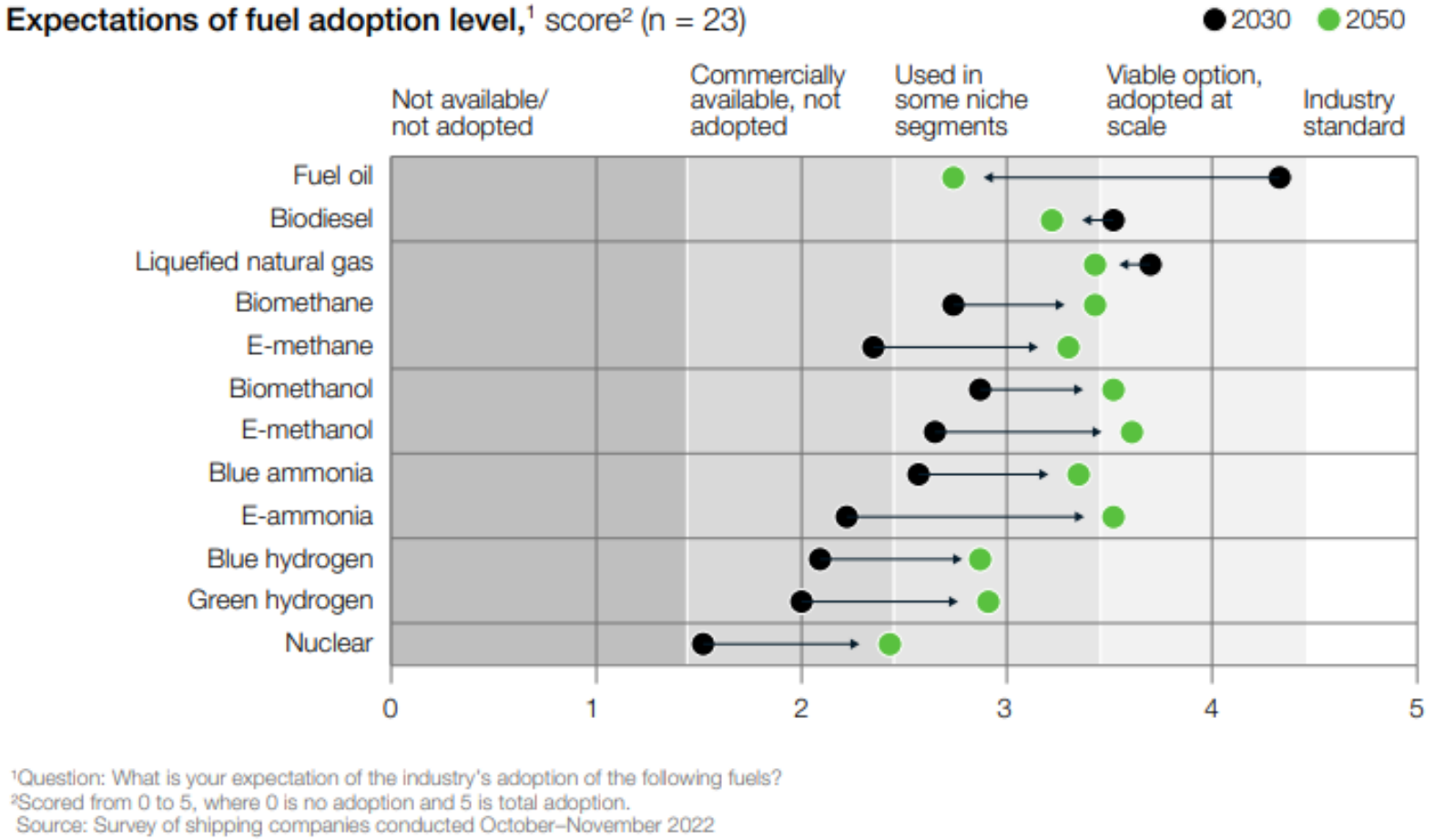
RLCF Alliance

ASK

With the information provided **regarding alternative fuels and innovative technologies,** are we able to identify any trends and/or anticipate demands for certain fuel types? If not, what more information is needed?

OPINION SURVEY (WITHOUT ANY SCIENTIFIC INVOLVEMENT)

Shipping company respondents expect fossil-based fuel oil to remain industry standard in 2030 but foresee no industry standard by 2050.



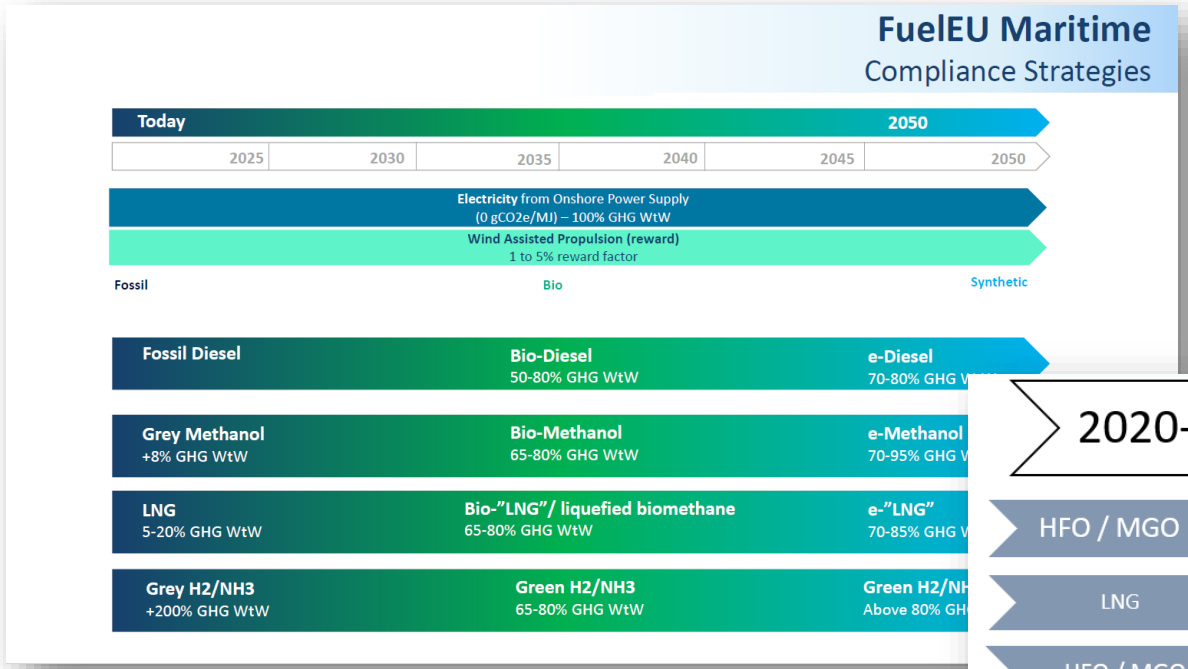
[1]Question: What is your expectation of the industry's adoption of the following fuels?
[2]Scored from 0 to 5, where 0 is no adoption and 5 is total adoption.
Source: Survey of shipping companies conducted October–November 2022

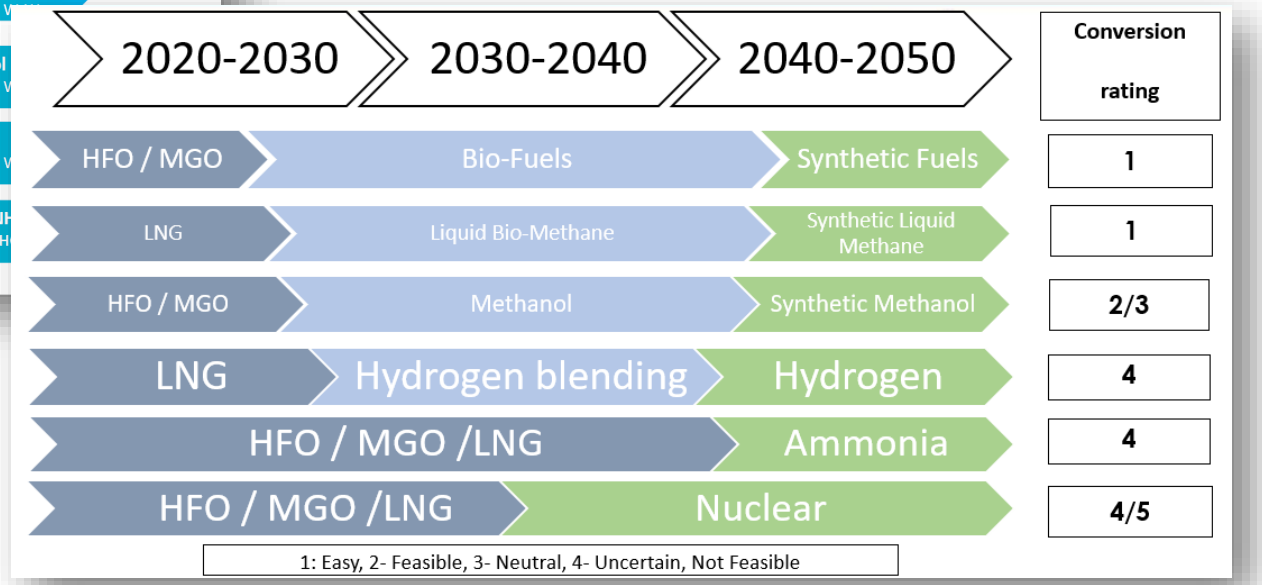
Reference: https://cms.zerocarbonshipping.com/media/uploads/documents/The-Shipping-Industrys-Fuel-Choices-on-the-Path-to-Net-Zero.pdf

From the CLIA "Alternative Fuel" Survey, we know what some of the Trends are

	# of Ships		
	In Use	Trial/Pilot	Newbuild
Alternative Fossil Fuels			
Methanol[1]			7
Liquified Natural Gas (LNG)[2]	9		23
Biofuels[3]			
Renewable Diesel (Hydrotreated Vegetable Oil (HVO)) from 1st generation feedstock[4]	4	6	1
Renewable Diesel (HVO) from 2d generation feedstock		2	
Methanol from 2nd and 3rd generation feedstocks		1	3
Dimethyl Ether (DME) from mixed generation feedstock		1	
Diesel (FAME) from 1st generation feedstock		2	
Diesel (FAME) from 2nd generation feedstock		8	
Liquid Biogas (LBG)		4	
Synthetic Carbon Fuels[5]			
E-Diesel (Fischer-Tropsch Diesel)		1	
E-Methanol		1	2
E-LNG			3
Zero Carbon / Green Fuels[6]			
Green Methanol			5
Green Hydrogen			2
Energy Source/Technology			
Hydrogen Fuel Cells		2	6
Methanol Fuel Cells		1	
Dual Fuel Engines	10		13
Efficiency Tracking Systems / Software	171	2	22
Wind (including solid sail technology)	3		
Battery Storage (Power Shaving)	1	1	2
Photovoltaic / Solar	5		

…THOUGH THERE ARE MANY MORE OPINIONS

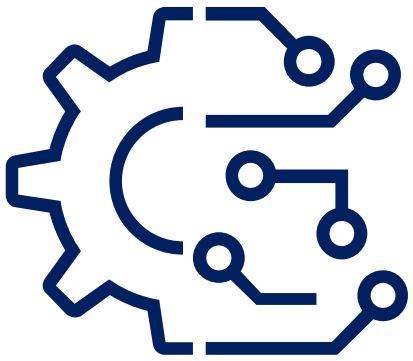




WHO OR WHAT THRIVES THIS INDUSTRIAL REVOLUTION?

Key events before the year 2000

Key events after the year 2000



Technology?

Policy?

What does that mean for our policy work, communication, investment decisions…

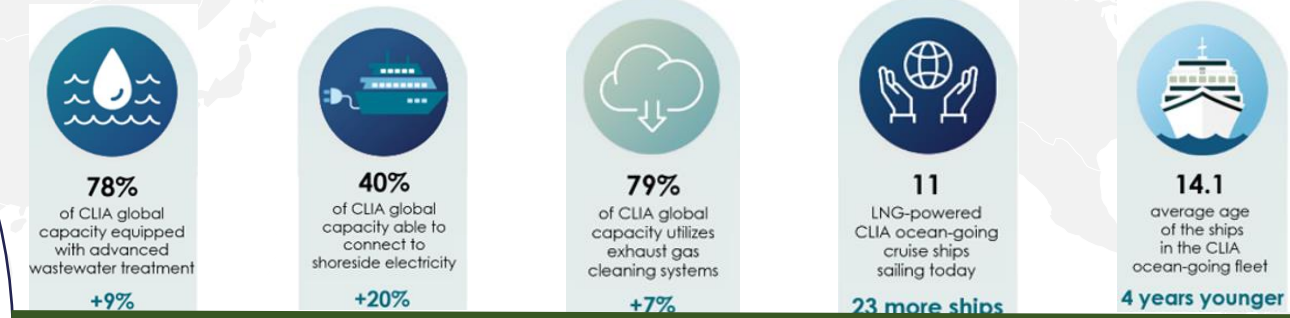
How can we communicate on the element of time?

Millennium Goals
(2000)

Sustainable Development Goals
(2015)

EU – Fit for 55
(2021)

Blue Flag
(2015



2050
(net zero)

1992
(Save the Waves – focus on sustainability)

2001
(Juneau Alaska – first shore power program negotiations)

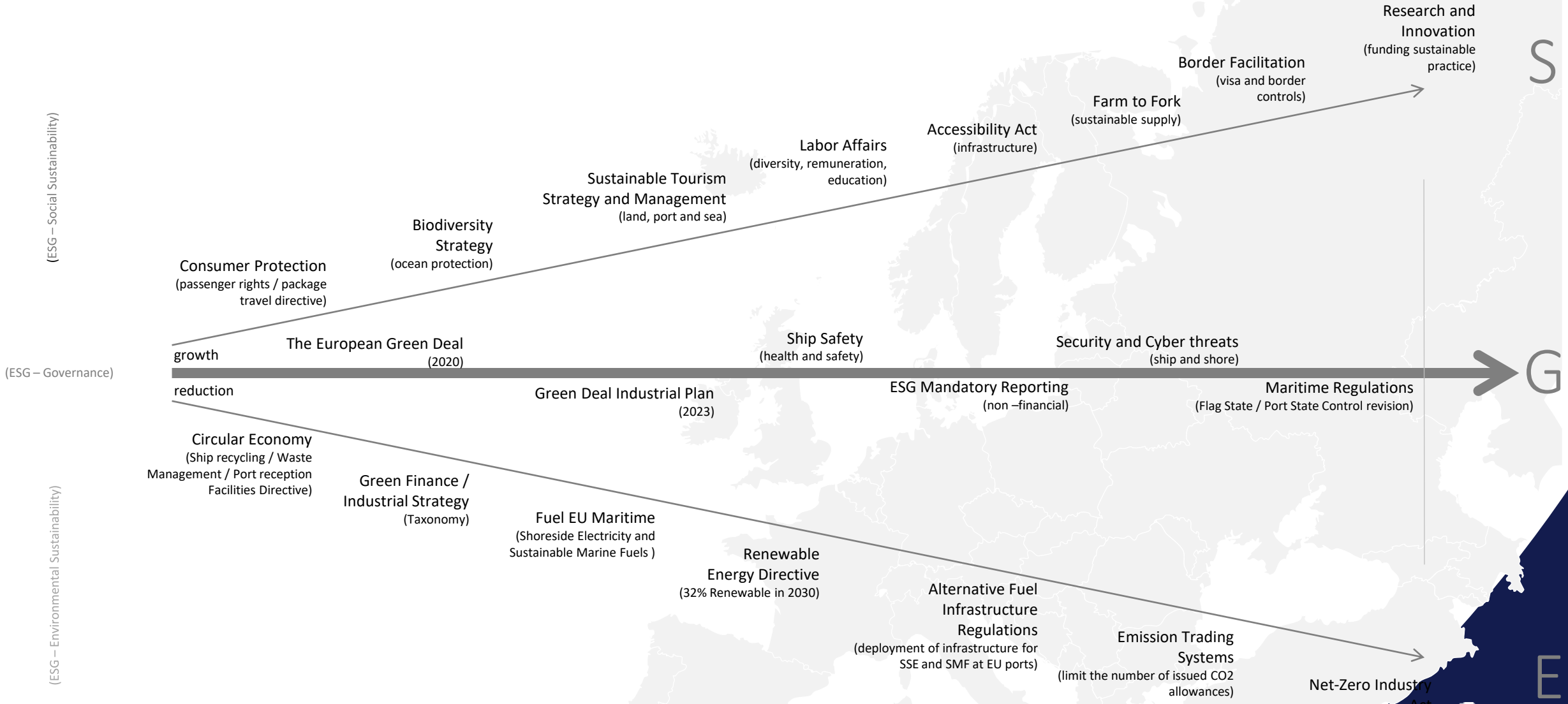
2007
(pioneering the first Exhaust Gas Cleaning System)

2013
(designing the first LNG-powered vessel)

2020
(pledge: pursuing net zero cruising)

ONE INDUSTRY. ONE VOICE.

How do we need to think about decarbonization?




Thank you
CLIA
CRUISE LINES
INTERNATIONAL
ASSOCIATION