

# Stakeholders and Sisters project workshop “Are EU ports ready for alternative fuels?”

## EVENT REPORT







## 1. Event Agenda

### Stakeholders and Sisters project workshop “Are EU ports ready for alternative fuels?”

*EU and IMO are strongly pushing the decarbonization of maritime sectors, setting ambitious emissions reduction targets and promoting technological R&D (also via several EU funded projects) to enable EU vessels to be soon fuelled by alternative fuels such as hydrogen, ammonia, methanol etc. Nevertheless, further to make EU vessels ready for alternative fuels, it is important to make EU ports ready as well from an infrastructure and regulatory points of view. As ports are ecosystem involving not only vessels and maritime operators, boosting decarbonization of EU ports via a proper “green fuel infrastructure” can be the entry point to facilitate EU port cities energy transition. Starting from ENGIMMONIA and SEANERGY EU Funded project experiences and presenting some EU lighthouse ports horizons, this workshop aims to collect feedback from relevant stakeholders in order to guide next steps of EU R&D and policy making.*

**Malmö, 10<sup>th</sup> November, 8.30 – 12.30**

#### *Venue*

#### **For PHYSICAL ATTENDANCE**

ROOM 235, World Maritime University, Fiskehamnsgatan 1, 211 18 Malmö, Sweden

#### **For VIRTUAL ATTENDANCE**

GOTOWEBINAR

Please register (both for physical and virtual presence) at this link

<https://attendee.gotowebinar.com/register/4058849799634159119>

Time	Activity	Presenter
8.30 – 8.45	Registration and networking	
8.45 – 9.15	Opening the event <i>Greetings from ENGIMMONIA coordinator and WMU delegates as hosting partners</i>	Aykut I. Ölçer - WMU Director of Research Daria Bellotti (UNIGE)
9.15 – 9.30	ENGIMMONIA project presentation	Andrea Pestarino (RINA-C)
9.30 – 9.45	SEANERGY project presentation	Fabio Ballini (WMU)
9.45 – 10.00	The role of EU ports and maritime sector in Energy Transition: where are we? Where can we go?	Jaap Gebraad (Waterborne)
10.00 – 10.15	Different way to decarbonize EU Ports: electricity and alternative fuels	Nicole Costa (SSPA)
10.30 – 10.45	The voice of EU Ports: Valencia	Josep Sanz Argent (FPV)







	Energy transition projects at the port of Valencia (EALING, H2PORTS, Green C Ports)	
10.30 – 10.45	The voice of EU Ports: Copenhagen-Malmö	Malthe Mulvad (Copenhagen Malmö Port)
10.45 – 11.00	The voice of EU Ports: Genova	Mario Franzone (Ports of Genoa)
11.00 – 11.30	Coffee Break	
11.30 – 12.15	<b>World Café Session</b> <i>Interactive discussion lead by RINA-C, UNIGE, WMU in working groups about four main questions</i>  Interactive discussion lead by RINA-C, UNIGE, WMU in working groups about four main questions: 1. The role of fuel/energy operator and fuel/energy grids manager in promoting ports energy transition (Infrastructure, fuel access easiness...) - <b>CHAIR: UNIGE</b> 2. The role of the port city (at citizens and politicians level) in promoting ports energy transition – <b>CHAIR: Ports of Genova</b> 3. The importance of clean multi-modal transport to promote port and maritime decarbonization – <b>CHAIR: WMU</b> 4. The role of ship owners and managers in promoting ports energy transition - <b>CHAIR: RINA</b> <b>GOAL:</b> realize per each topic/Question a PESTLE/SWOT analysis to collect port stakeholders' perspective	
12.15 – 12.30	Wrap up the discussion and closing the event	Andrea Pestarino (RINA-C)

## THE LOCATION



**WMU - Street address: Fiskehamnsgatan 1, 211 18 Malmö, Sweden – Phone: +4640356300**

300 metres from Malmö Central station (2) The entrance of the building is where the new building is joined to the old, facing the canal.







## 2. List of the Attendees

### PHYSICAL ATTENDEES

Stakeholders and Sisters project workshop "Are EU ports ready for alternative fuels?" 10th November 2022 9:00-13:00 Malmo - World Maritime University					
Name	Surname	INSTITUTION	TYPE OF INSTITUTION	Signature	email
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JOSEF	SANZ ARGENT	Valenciaport Foundation			
MALTHE	MULVAD	Copenhagen Malmö Port			
Anastasia	Christodoulou	WMU			
Monica	Canepa	WMU			
Fabio	Ballini	WMU			
Anas	Saleh Mohammad	WMU			
Peyman	Ghaforian Masoudzadeh	WMU			
Aykut	Olcer	WMU			
Baris	Barlas	WMU			
Hans	Stolt	Stolt			
Nikos	Papapanagiotou	Stolt			
Elisavet	Theodorou				
Alessandro	Schönborn	WMU			
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### WEB ATTENDEES

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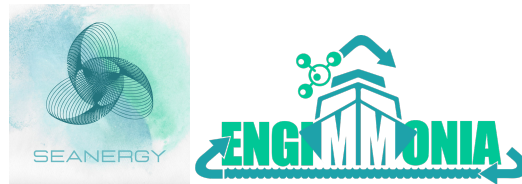




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### 3. Workshop Results

The event was mostly divided in two parts: 1) a first session with speeches by keynote speakers and presentation of the two hosting projects and from Waterborne; 2) a second session where working groups were organized being operative and interactive via a World Café session (two rounds).

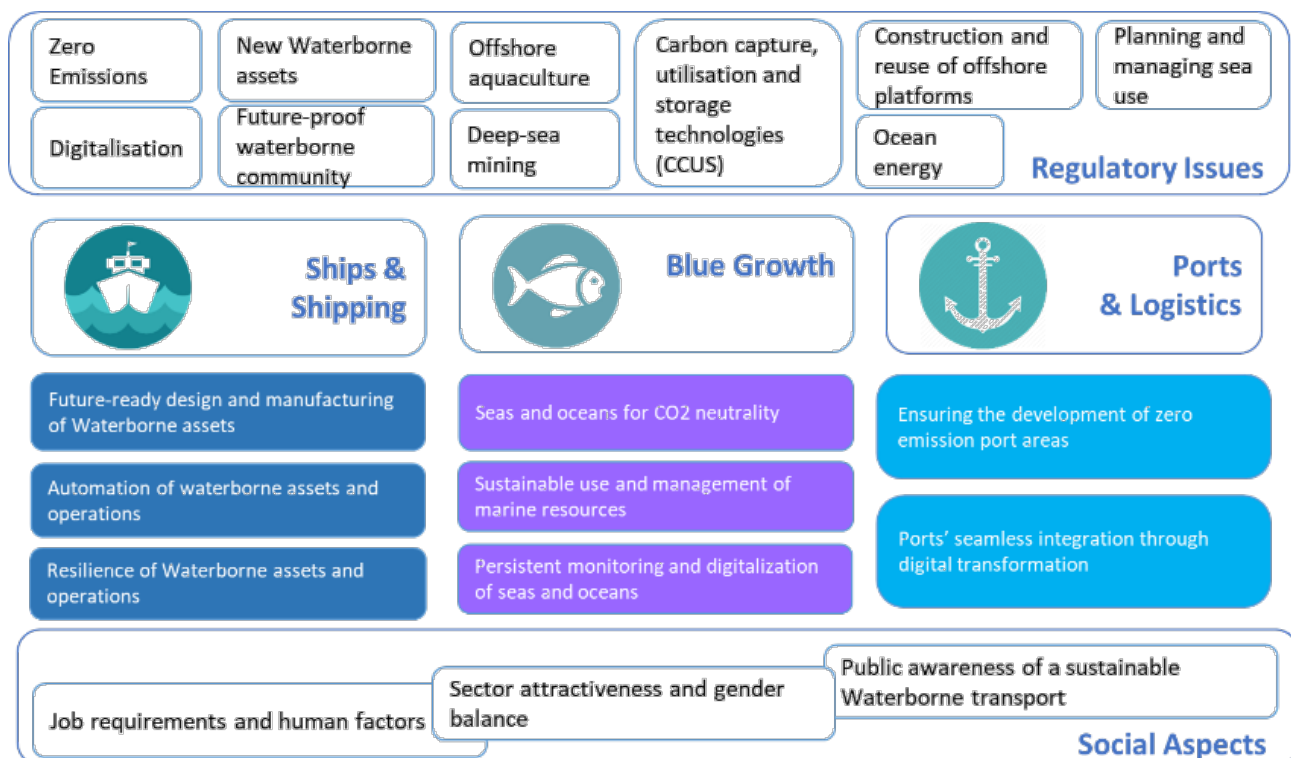
#### 3.1 First Session: Presentation from the Speakers

##### INTRODUCTORY PART

**Welcoming from WMU:** Dr Aykut I. Ölçer – WMU R&D Director – briefly presented WMU R&D activities warmly welcoming event attendees to WMU headquarters

**ENGIMMONIA And SEANERGY Presentation:** ENGIMMONIA (Mr Andrea Pestarino – RINA Consulting) and SEANERGY (Prof. Fabio Ballini - WMU) projects presented their R&D activities and goals and how they are targeting the promotion of alternative fuels for shipping and ports

**Speech from WATERBORNE delegate:** Mr Jaap Gebraad who presented WATERBORNE perspective and the key role of ports in EU maritime decarbonization strategy (with their specific role in WATERBORNE SRIA as presented in picture below).



##### THE VOICE OF EU PORTS AND BEST PRACTICES/EXPERIENCES SHARING

The second part of the first session was dedicated to sharing of experiences from EU Ports about the use of different alternative fuels in port operation and local shipping.

- 1) **Different way to decarbonize EU Ports: electricity and alternative fuels:** Nicole Costa from SSPA, presented some Swedish experiences about Onshore Power Supply (OPS) & Shoreside Battery



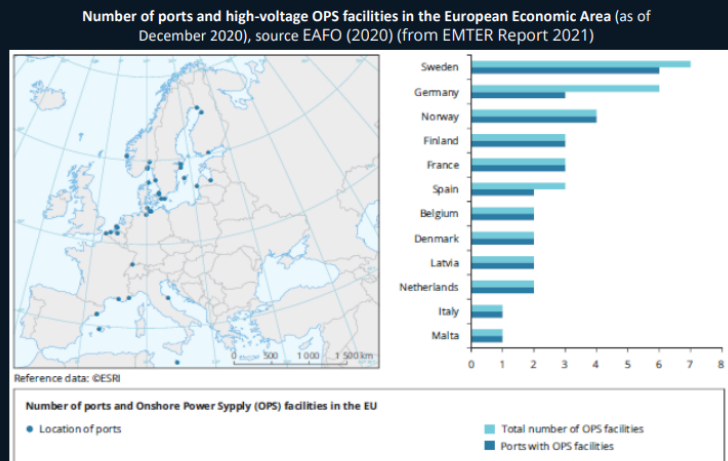




Charging (SBC), coming from National funded KAJ-EL and SeaCharging projects. Firstly she presented an overview of EU “ready to electrification” ports (thus equipped with HV connection), thus also showcasing the frontrunner experience of the Baltics in this sense.

## Overview of EU ports with HV OPS

- More than 31 EU ports with OPS
- Sweden at forefront of OPS
- ~10% of vessels calling at EU ports have OPS (HV)



A focus on Sweden was then performed, highlighting that many Swedish ports have OPS (Stockholm, Gothenburg, Visby, Helsingborg, Karlskrona, Trelleborg, Ystad, Piteå, Luleå, etc.) mostly for ro-pax/ferries and on public transport vessels (More predictable).

According to Swedish experience some relevant guidelines to facilitate the electrification of port and installation of specific infrastructure could be identified.

## Criteria for infrastructure decisions

- **Power demand & electricity availability**
  - Grid extensions, energy storage
- **Frequency, voltage & current compatible**
  - Transformers ashore or onboard – space & weight to be considered
- **Voltage & current – based on power demand**
  - LV can use AC <1 MW or DC 1-1.5 MW
  - HV only AC: 1-22 MW (reduced cable size & number than LV)
  - Boats length >25m, AC HV for quick charging
  - Boats length <25m, DC CCS-2 (LV) for quick charging
- **Plugs & cables – different standards**
  - DC thinner & water-cooled cables (but shorter (5-10 meters))
- **Location of equipment** (ashore, onboard hatch etc)
- **Connection type**
  - Manual vs. automatic (quicker connection, maintenance issues)
  - Induction (small ferries up to 200 KW)
- **Infrastructure**
  - Fixed vs. mobile
  - Type of quay/ramp, weather exposure
  - Mooring system
- **Time at berth/route schedule**
  - Manual connection/disconnection ~ 10-30 min
  - Minimum 2-4h at berth OPS
  - Quick charging needs automatic connection
  - AC for long charging time; DC for short
- **Certification**
  - HV requires safety training and certification
  - Equipment onboard needs to be class-approved

Also considering that standardization process is still on-going, mostly at infrastructure level than at vehicles/vessel level (opposite situation than EV).







Standards for marine electrical connections					
EMSA shore power guide 2022					
SSE Type		Interconnectivity	Interoperability	Data Communication	International/EU Regulatory
OPS (Onshore Power Supply)	High-Voltage Shore Connection (HVSC)	IEC 62613-1:2016 (General) IEC 62613-2:2016 (Connector geometry/ dimensions)	IEC/IEEE 80005-1 (HVSC) <b>Mandatory in EU</b>	IEC/IEEE 80005-2 (Data Communication)	IMO OPS Guidelines EU AFID
	Low-Voltage Shore Connection (LVSC)	IEC 60309-5	IEC/IEEE 80005-3 (under review/development)	IEC/IEEE 80005-2	IMO OPS Guidelines already refer
	LVSC – Inland Waterways (IW)	EN 15869-2:2019 (up 125A) EN 16840: 2017 (above 250A)		Possible application of IEC/IEEE 80005-2	CCNR CESNI – ES-TRIN2019
	Recreational Craft/ Marinas <b>For charging eg. overnight, or OPS</b>	IEC 60309-2	Not standardized	Not standardized	Not relevant international standard applicable to
SBC (Shore-side Battery Charging)	SBC-AC (AC charging)	IEC 60309-5/ IEC 62613-2 AC connection (As standard OPS connectivity)	IEC/IEEE 80005 series As OPS – ship-side charging.	<b>Not standardized</b>  (possible development/ applicability for IEC/IEEE 80005-2 or ISO15118) <b>for connections EV-station</b>	<b>No applicable</b> international regulatory instrument applicable to SBC
	SBC-DC (DC Charging)	<b>Not standardized</b> <b>EV's CCS-2 for fast charging of recreational craft; upcoming MCS CharIN</b>	<b>Not standardized</b>		
Your Maritime Solution Partner <ul style="list-style-type: none"> <li>Megawatt Charging System (a triangular contact) for larger units incl. e-ferries and ships (up to 7 MW, 1250 volts, 3000 Amp-DC connections) (each cable for DC can today handle up to 350KW and being aimed at 3.75 MW/cable for the MCS)</li> <li>To be launched in 2024</li> </ul>					

At the end of her presentation, Ms Costa shared some closing remarks highlighting how electrification of internal maritime transport is already part of Swedish maritime decarbonization strategy: nevertheless significant investments would be needed to fully roll it out.

- 2) **The voice of EU Ports - Valencia:** Dr Josep Sanz Argent (Fundacion Valencia Port), presented activities on-going in Valencia port, who is testing different solutions (from cold ironing, to the use of hydrogen fuelled operating vehicles for port services/operation) and promoting its own Renewable Energy production, also in the framework of relevant EU funded projects like EALING, H2PORTS, Green C Ports. Promotion of alternative fuels is just indeed a part of a more complex sustainable development process that port of Valencia is pursuing towards a zero emission port.





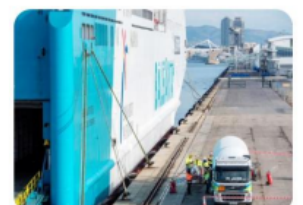


Promoting local renewable electricity production as well as transferring know-how from LNG experiences to hydrogen one, enabled Valencia port to be European lighthouse particularly for using hydrogen for port operation as well as collecting some relevant guidelines for future alternative fuels introduction, highlighting the need not only of adequate infrastructure and regulation, but also of trained personnel and business cases that (not only if supported by public funding) could reduce the risk of investments.

## ARE PORTS READY FOR NEW FUELS?



- Lessons learnt from LNG as bunker fuel
  - Infrastructure (small scale terminals, bunkering barges, trucks, etc.)
  - Regulatory framework from both vessels (e.g. IGF code) and ports (mainly related to safety)
  - Trained personnel (thus training programs)
- Innovation to solve pending issues
- Engines, terminal machinery, etc available on the market
- Forerunners showing that the alternative is feasible
- Business cases appealing to private investors
- Public support to reduce the risks







- 3) **The voice of EU Ports - Copenhagen-Malmö:** Mr Malthe Mulvad presented experiences from Copenhagen-Malmö port and the potential (In terms of renewable energy production, vessels routing/sailing and industrial production) of Oresund region (and of Baltics in General) of being frontrunner in maritime sector decarbonization, starting from the port environment who is targeting to be CO2 neutral within 2025.

### COOPERATION IS THE KEY

- The Oresund bridge was opened in 2000 – huge opportunities for the region
  - CMP was founded in 2001 to meet the new market
- Two countries – two cities – one port
- Future expansion – new port facilities
- Largest hub for new cars in Scandinavia
- Leading cruise port in Northern Europe
- A designated Core Port in the European TEN network

A photograph of the Oresund Bridge, a long cable-stayed bridge spanning a body of water. The bridge has multiple tall pylons and a long deck with vehicles. The sky is clear and blue.

**CMP COPENHAGEN MALMÖ PORT**

*A safe haven. A sea of opportunities.*

To achieve this ambitious target, the port of Copenhagen-Malmö is not only promoting alternative fuels and electrification in its “ecosystem-operating environment”, but it aims to become “Green fuel hub” to exploit the potential production of green hydrogen and electro-fuels that could be produced valorising the high amount of RES of the areas (e.g. Prøvestenen project – green energy island in the heart of Copenhagen).







## CMPs work with alternative fuels

- Decarbonization of CMPs own operations
- Provision of shore power for ferry and cruise (planned)
- Developing system for differentiated port fees based on environmental performance
- Dialogue with costumers on green fuel handling at terminals
- Exploration of opportunities for Carbon Capture, Use and Storage (CCUS), Power-to-X and green fuel production at port facilities
- Specific focus on green fuels for aviation and maritime industries



CMP COPENHAGEN MALMÖ PORT

*A safe haven. A sea of opportunities.*

Thanks to its unique identity (the only transnational port in EU), Copenhagen-Malmö port could have both advantages (e.g. facilitate investments from both countries) and disadvantages (e.g. working with different electric grid and energy market regulation) in an easier penetration of alternative fuels in ports; nevertheless its unique position and renewable surrounding area production potential could really enable Copenhagen-Malmö to become green energy/green fuel hub

## Are EU ports ready for alternative fuels?



- Challenges:
  - No clear single transitional and longterm standard—LPG, ammonia, methanol, hydrogen etc.
  - Lack of technology neutrality of regulations: risk of promoting a specific technology (e.g. shore power) rather than a desired outcome (reduction of emissions)
  - Sufficient capacity of renewable energy for green fuel production
  - Massive investment needs
- Interaction with local context and politics
  - Potentially different national strategies (SE, DK) + EU regulations
  - Ensuring space and long planning horizons for green fuel infrastructure
  - Some green fuels may need additional safety zones/precautions
  - Grid capacity and competing prioritization for shore power and electrification
  - Shipping by sea in general most sustainable means of transport, but supply chains often “invisible” to the public and mainly negative externalities are perceived

CMP COPENHAGEN MALMÖ PORT

*A safe haven. A sea of opportunities.*







- 4) **The voice of EU Ports - Genova:** the last of first session speakers was Mr Mario Franzone who presented Port of Genova experience, starting from its sustainability masterplan, strongly targeting emission reduction at urban level considering the position of the port infrastructure in the urban context.



**Action Plan**  
**PROGRAMME**  
 Port Environmental Energy Plan of the Port Authority (January 2020)

- **Cold Ironing** and **alternative fuels**
- Improve **modal split from road to rail** and overall port vehicles in/out management (**buffer areas**)
- Building a circular economy in port and **waste management**
- Quality air, water and noise **monitoring**
- **Reduced impact** of port activities along the Port-City waterfront and mitigation measures

**NEXT GENERATION EU – GREEN PORT (PNRR)**

- Port Energy Hub. **Smart grid, photovoltaic system:** production of **hydrogen from renewable sources**
- **Multifuel recharging stations** (GNL/H<sub>2</sub>)
- Zero emissions in port → **electrical mobility** solutions

At this purpose, the port of Genova strongly worked mostly on two topics: On Shore Power Supply and promotion of LNG, also thanks to the support of CEF funds. CEF Funds have been so far particularly relevant to promote OPS/cold ironing infrastructure in both Genova and Savona ports, for cruise/ferries and container ships. In parallel a mobile LNG refuelling station has been realized and tested in Genova, La Spezia, Livorno thanks to INTERREG “GNL FACILE” Project.



Next step of Genova Sustainable energy strategy will be dedicated to the setup of a portual “ENERGY HUB” with significant local RES production (PV) to be managed thanks to the support of EV and electrolyser (Power-to-hydrogen) systems too, thanks to Italian “NEXT GENERATION EU” funds.







## Port Energy Hub

**APPARECCHIATURE - LEGGE**

DESCRIZIONE	UNITA' DI MISURA	QUANTITA'
1. Pompa elettrica	CV	1
2. Valvola di intercettazione	CV	1
3. Valvola di intercettazione	CV	1
4. Valvola di intercettazione	CV	1
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22. Valvola di intercettazione	CV	1
23. Valvola di intercettazione	CV	1
24. Valvola di intercettazione	CV	1
25. Valvola di intercettazione	CV	1

**Schema di collegamento**

**Sezione trasversale**

- Part of
- Next Generation EU**
- Recovery and Resilience Facility

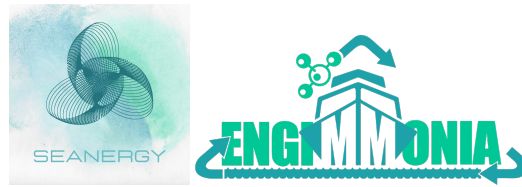
An interesting suggestion came from Port of Genova proposing a sort of “EU Roadmap/Strategy/picture” for EU ports related to bunkering of alternative fuels

*are PORTS OF GENOA ready for alternative fuels?*

	COLD IRONING	LNG (Bio-LNG)	Hydrogen/ Ammonia/Methanol...
Regulatory framework			
Technical readiness			
Forecasted uptake			
Social acceptability			
Availability of spaces			

- Setting up of incentive/cost reduction systems to make the on-shore electrical power supply **economically sustainable** both at European and National level → *energy distribution issue*
- Focus on a limited number of **technologies** to be developed for **large-scale** alternative fuels production at **cost-competitive** price levels
- An overall **strategy**, at EU regulatory level, could be helpful to help ports for the selection/creation process of bunkering/refuelling infrastructures of alternative fuels
- Train **specialized personnel** to manage highly technological installations





### 3.2 Second Session: Working group results

The second part of the workshop was dedicated to some brief working group tables, where event attendees could share suggestions/insights/Recommendations to the two projects about the following aspects:

1. The role of fuel/energy operator and fuel/energy grids manager in promoting ports energy transition (Infrastructure, fuel access easiness...) – Moderator: UNIGE
2. The role of the port city (at citizens and politicians level) in promoting ports energy transition – Moderator: PORT OF GENOVA
3. The importance of clean multi-modal transport to promote port and maritime decarbonization – Moderator: WMU
4. The role of ship owners and managers in promoting ports energy transition – Moderator: RINA

The working groups were setup informally according to attendees' preferences via "World Cafè" approach and they had the chance to share insights via notes reported on "Post-it"/posters on the table.

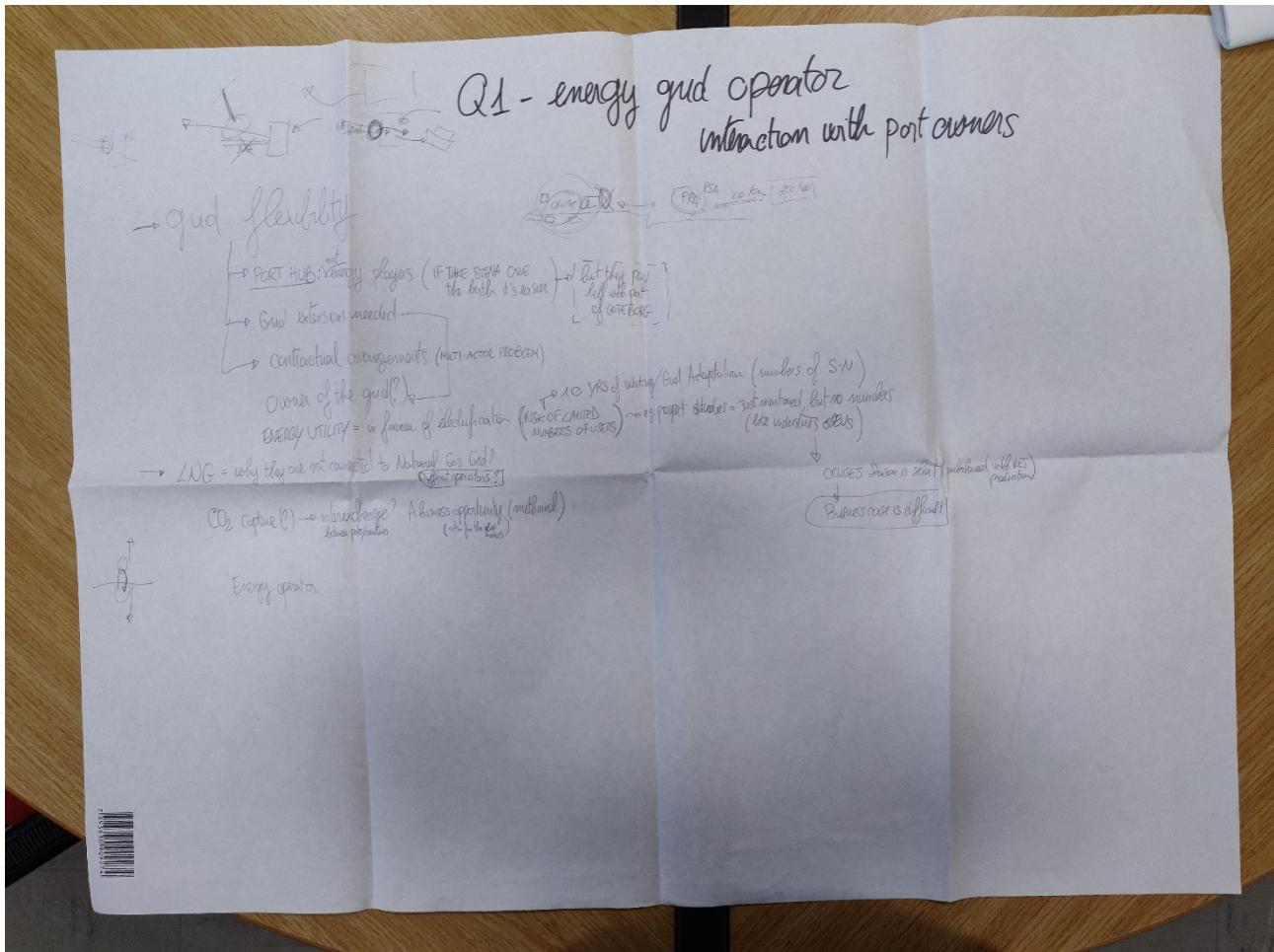
The World Cafe is a method which makes use of an informal cafe setting for participants to explore an issue by discussing it in small table groups. Discussion was held in two rounds of 20-30 minutes, allowing a more relaxed and open conversations to take place thanks to moderators' support.

Here in the following some keynotes collected from each table:

- 1. The role of fuel/energy operator and fuel/energy grids manager in promoting ports energy transition (Infrastructure, fuel access easiness...) – Moderator: UNIGE**







The interaction with energy operator (mostly gas grid and electricity distributors, but also with fuel suppliers) is crucial to guarantee a reliable energy provision to ports. Particularly looking at cold ironing and maritime electrification, it's obvious (as also highlighted by Ms Costa during her speech in the first session of the event) that the risk of grid unbalancing and the need of grid reinforcement has to be taken into account, even in presence of local power production from RES or other local power plants.

It is relevant to highlight that in EU in 95% of the case, ports are not the owner of any energy infrastructure (neither gas nor electric grids), except sometimes for fuel tanks/fuel refuelling stations (if not directly managed by fuel companies). Two main discussions were held, one on the interaction of ports with electric grid and one with gas grid.

### **ELECTRIC GRID INTERACTION**

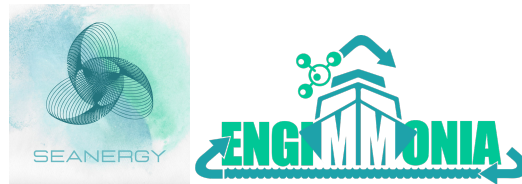
Even if port could become technically easily "ENERGY HUB" and "GRID FLEXIBILITY ACTORS" (thanks to both cold-ironing "storage" – battery on vessel approach – and local RES production) on the electric market, this approach should foresee different technical/non-technical measures to be implemented:

Ports must become energy actors active on the electric market (and to be authorized to do so as well as if possible to own the local electric grid - e.g. in Goteborg situation, STENA LINES is the energy actor, but the grid is not owned by STENA LINES and therefore they pay the bill jointly with the Port of Goteborg)

Grid extensions/reinforcement must be needed: but who will be the investor? The port? The DSO/energy grid as it is receiving benefit from port flexibility services?







It's clear enabling port to operate on energy market is a "MULTI-ACTOR" Problem and specific contractual arrangements (and legal ones too) must be identified among the local shareholder/stakeholders

Generally speaking energy operators/energy utilities/grid operators are in favour of electrification, but none of them is willing to invest in first person on "grid upgrade" to enable port electrification: it is indeed a process requiring up to 10 years of grid adaptation/reinforcing working at hardware and management level, with a potential risk of limited users (or at least not continuous users). For example in all "FUTURE EU ELECTRIFICATION PROSPECT STUDIES" port electrification and maritime sector electrification is always mentioned as a potential idea, but it is never corroborated by numbers or projections (differently than projections of grid users related to Electric Vehicles or electrified industries). Further to this, it is relevant to highlight that in this moment, Cruises seems to be the easiest (and more effective) type of vessels where to apply cold-ironing: at the same time, cruises have a "Short operating season", thus limiting their "Storage on board-grid flexibility services provision opportunity" to a limited period of the year, reducing therefore the bankability of the investment.

At the same time, ports are often reluctant to invest on grid reinforcement as they will not be the grid owner. What could happen is therefore that ports could be interested in investing in "cold ironing spots/charger", but not being viable to operate due to grid weakness or other non-technical grid aspects. The same risk could appear looking at possibility to install large electrolysis plant in port environment

## **GAS GRID INTERACTION**

Regarding gas grid interaction, this is a relevant aspects for both LNG and H2 promotion.

Gas Grid operators (TSO) are often owning LNG re-gasification hubs in ports, thus facilitating the interoperability of these assets with the whole National gas grids as well as the possibility to evaluate H2 produced in ports area (for future local captive use in ports vehicles and/or in vessels) injection in the local grid.

Nevertheless the possibility for installing electrolysis plants and/or large LNG/H2 hubs/bunkering facilities are often discouraged by Health&Safety and permitting issues, that are particularly relevant in ports located in urbanized areas.

Last aspect (related to energy grids interaction) that the working groups presented was the possibility to start to think about ports as "CO2 HUB", where CO2 could be stored/inter-exchanged between different countries/ports as well as with the inland. Setting up CO2 infrastructure in ports where H2 production could be favourable could be indeed a relevant business opportunity for some ports to locally produce methane and methanol: two fuels already used in vessels and more easy-to-be-stored locally in ports and on-board (thus maybe attracting joint investments not only by energy grids operators but also by ship-owners).

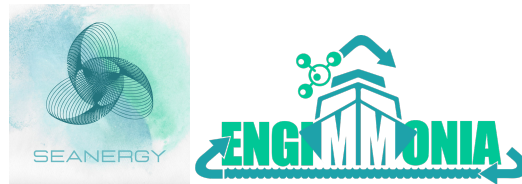
## **2. The role of the port city (at citizens and politicians level) in promoting ports energy transition – Moderator: PORT OF GENOVA**

The role of port city to promote ports' decarbonization has been analysed at three levels:

**OVERALL CITY INFRASTRUCTURE, POLICIES AND ECOSYSTEM:** the port energy transition must be integrated at local level both in local city safety and energy masterplan, as well as in the overall business strategy/market offering of the city (e.g. mutual plan towards "Zero-emission") that should involve also local relevant stakeholders (e.g. universities). In this sense indeed, the promotion of a







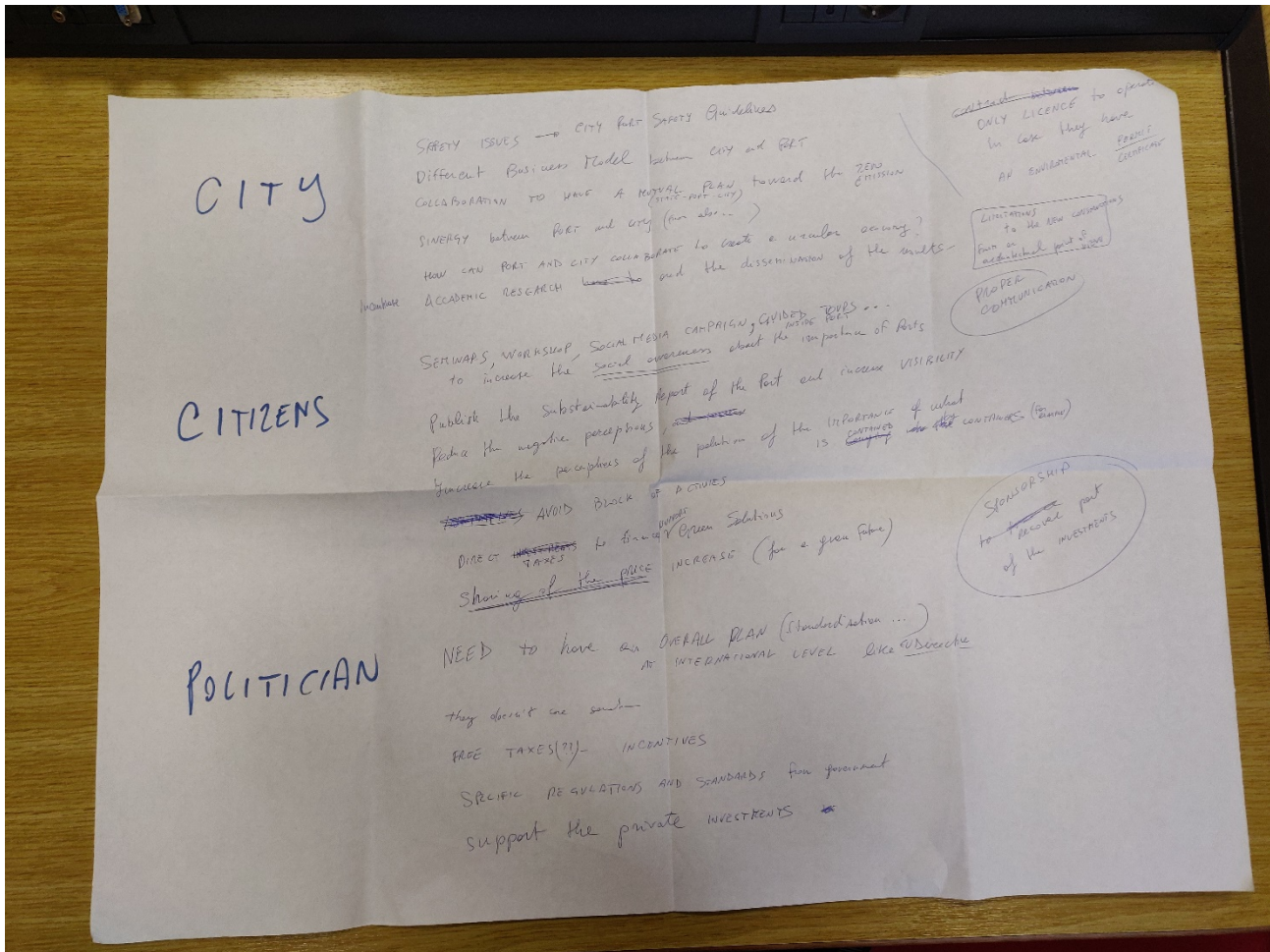
certain “green port approach” (e.g. obliging licence to operate/sail only in presence of specific environmental permit/certification) could be from one side an opportunity, but maybe a business risk too (reduction of freight volumes at a first glance/moment). In this sense ports and cities have to mutually support (from a policy and investment level) to pursue decarbonization strategies. Further to this, cities regulators must recognize that ports decarbonization could require relevant investment in infrastructure that could be in contrast (particularly in Mediterranean or more ancient EU ports) with cultural/natural heritage prescriptions.

**CITIZENS:** despite being in principle all favourable to “green transition”, citizens must be properly educated to the opportunities and risks that EU Ports/maritime sector decarbonization could bring to EU cities. Seminars, workshops, video and social media campaign must be promoted to increase visibility and social awareness of ports’ action, also transparently presenting the needs of “higher economic costs” of such ports decarbonization (e.g. higher goods costs, municipal taxes to support local investments, risk of workforce reduction at local level due to an initial reduction of freight volumes...)

**POLITICIANS:** EU port cities should be driven by a common EU strategy and directive, with clear guidelines about “which fuels to be promoted and why” in a coordinated way to avoid scattered initiatives whose results could be fragmented. Guidelines to support interventions via proper common Safety and Permitting rules as well as common supporting measures (e.g. free taxes, incentives...) should be promoted at EU Level as well in order to avoid the risk of having countries where “alternative fuels infrastructure investments” could be easier.







### 3. The importance of clean multi-modal transport to promote port and maritime decarbonization – Moderator: WMU

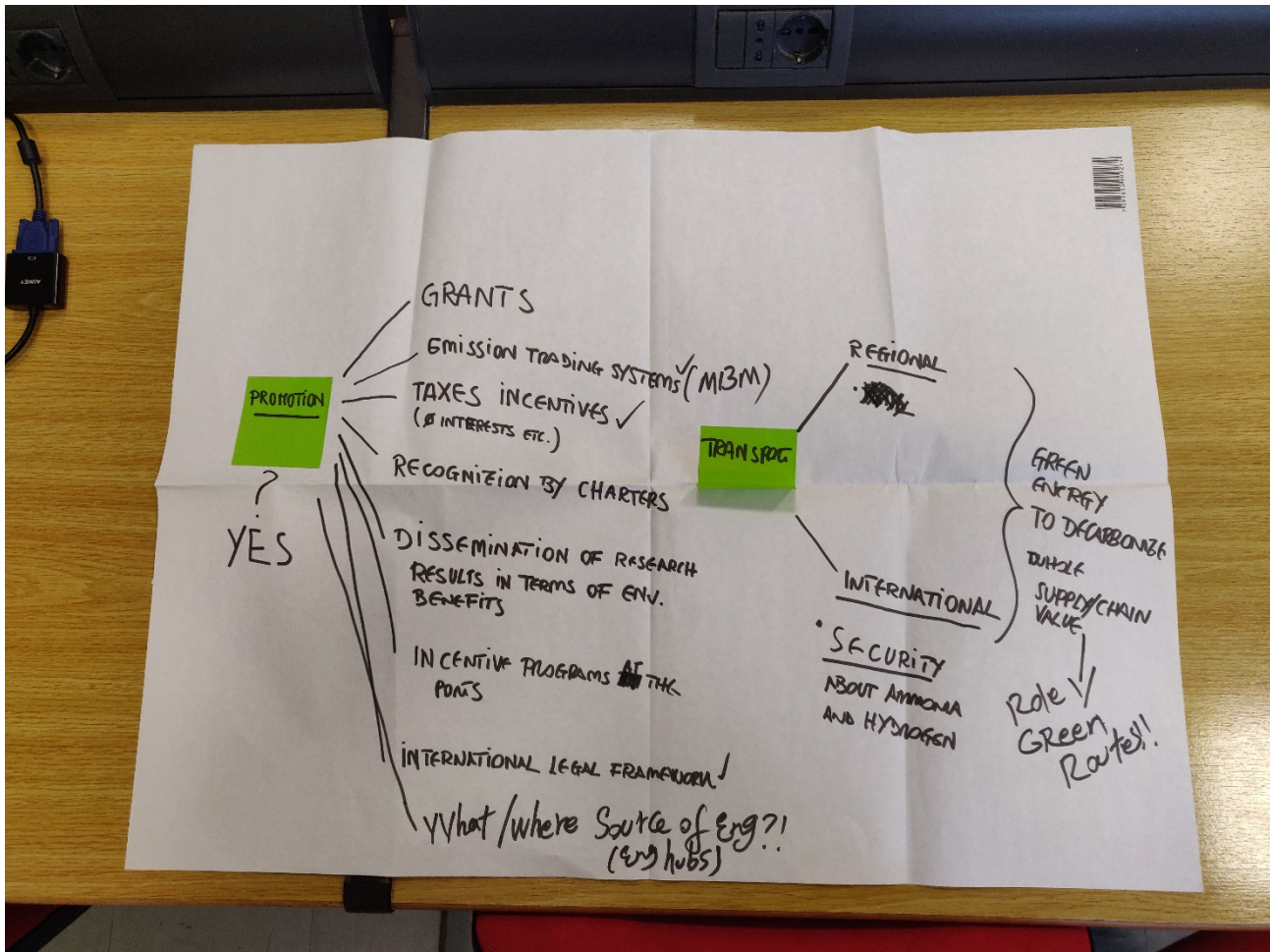
Clean multi-modal transport is a strategic approach that could boost port and maritime decarbonization in an integrated “GREEN ROUTE” approach. This is something that EU is already looking at also in its CEF facilities initiatives, which mostly look at the promotion of Green corridors and international hubs.

Nevertheless the promotion of “Regional routing” decarbonization must be tackled too, maybe encouraging Member States to operate in this direction via a Cascade approach: EU support investments “cross-borders” but in presence of significant local decarbonization actions. This is of course easier for electrification (relying on electrified transport/railway infrastructure) of ports and more complicated if looking at the use of alternative fuels in road transports, due to investment needed both in refuelling infrastructure and vehicles. In this sense, EU should also encourage a common and easier regulatory approach for security/permitting of ammonia and hydrogen bunkering in Member States, in order to avoid any dual track policy in this sense to properly follow above mentioned approach.

To do so and also to attract investments by relevant stakeholders (port authorities as well as ship owners/managers) different initiatives should be promoted (Some of them already in place): grants, integration of logistics operators and ships in ETS, 0 interests loans, taxes incentives, no good taxes in ports if the ship is emission free, no taxes on alternative fuels for green vessels/Intermodal transports...







#### 4. The role of ship owners and managers in promoting ports energy transition – Moderator: RINA

In this working group different issues to be tackled/solved to facilitate vessels decarbonization and their interoperability in ports have been identified. In order to do so, ship owners (and the whole maritime sector) should identify preferable alternative fuels per each scenario/type of vessel in order to prioritize vessels upgrade in the most correct way and provide guidelines to ports in order to locally implement the most proper refuelling infrastructure according to the type of vessels locally present.

To do so, ship owners should take advantage of experience gained so far for LNG and electrified vessels, in order to define different “maritime scenarios” to be benchmarked/compared with “mainland alternative fuels production scenarios” from the energy sector (PRIORITY 1). At this purpose, it will be necessary to quantify the amount of energy and fuel needed (PRIORITY 2), in order then to imagine proper business models (even joint energy/fuel operator-vessel owners/managers – PRIORITY 3) also supported by Energy PPP contracts as well as by public/private investments to boost vessels decarbonization and subsequent precise port infrastructure upgrade.

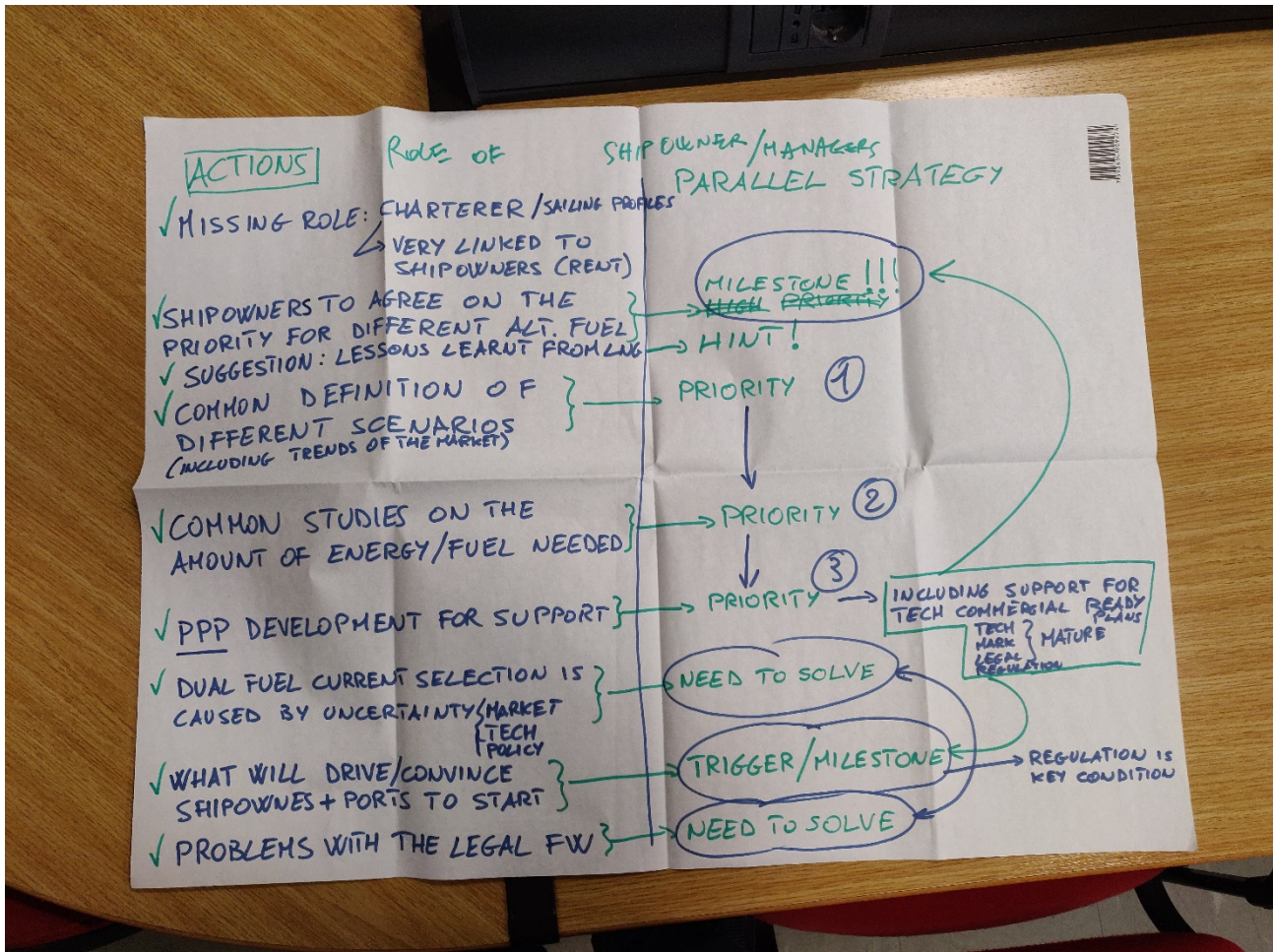
Clear guidelines at IMO-EU level for the different “Vessel segments” (and therefore to port hub per each of them) must be identified in order to avoid current scattered “Multiple clean energy solutions betting”/dual fuel approach, which is of course positive, but still not so much ambitious to encourage a full decarbonization of the maritime sector as well as not providing clear guidelines to EU ports to setup a proper fuel/energy



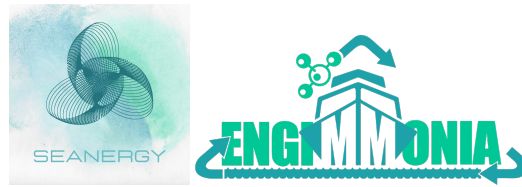




infrastructure more dedicated to each “Key technology/fuel” per each vessel more commonly present in the port.







## 5. Conclusions

The workshop provided clear guidelines to both projects in order to promote an EU roadmap for the decarbonization and promotion of alternative fuels in EU ports.

According to Working group discussion, it's clear that a common EU strategy in this sense could be developed based on:

- Alternative fuels which could be more effective per each type of vessel
- Analysis of the routing of each vessels among EU ports in order to: 1) identify EU hubs per each type of vessel; 2) identify typical journey/fuel need of each type of vessel
- Analysis of EU countries energy plans and alternative fuel production/storage hubs location

Matching all these information will enable to identify "EU HOTSPOTS/HOT-PORTS" per each alternative fuel, in order to promote precise infrastructure in specific ports, facilitating investment.

A preliminary study in this sense will be pursued by UNIGE and WMU in the framework of respective ENGIMMONIA (analysis of vessels) and SEANERGY (analysis of ports) project activities.

Considering the success of the initiative, both projects are willing to further promote mutual interaction initiatives, joint research and events.







## 6. Pictures of the Event





