



Needs

*New Sustainable Fuel Deployment Scenarios
for the European Waterborne Community*

D5.5 Main Results of the Network Consultations





Document Information	
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Needs



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1. Introduction – The Network Consultations

The Steerer Network is the key consultation body for the NEEDS consortium. A well-balanced mix of different types of stakeholders from different waterborne transport segments is represented in the SN: ship owners, ports, shipyards, equipment manufacturers, research centres and universities, etc..

The consultations with the SN through the course of the NEEDS project were in practice made to a broader audience, and took the form of public consultations, workshops and conference presentations.

Section 2 of this document summarises the outcome of these consultations, and outputs, where appropriate, are tabled in Section 3.

2. Consultations and Presentations

2.1 EU Shipping BCE

Conference: The role of Low Carbon Fuels in Decarbonising Maritime Transport

Date: 19 – 21 September 2022

Location: Eugenides Foundation, Athens, Greece, + Online.

Audience: 591 registered participants from 42 countries.

Presentation by Mr Lefteris Sdoukopoulos (Hellenic Institute of Transport):

“New sustainable fuel deployment scenarios for the European waterborne community: the NEEDS project approach”





Outcomes / Feedback:

The presentation was noted to be extensive, clear and excellent. Unfortunately there was no time for questions afterwards.

2.2 STEERER Expert Group Meeting

Workshop

Date: 21 September 2022

Location: Bruxelles, Belgium.

Audience: 40 participants on site.

Presentation by Mr Guilhem Gaillarde (MARIN):

“New sustainable fuel deployment scenarios for the European waterborne community: the NEEDS project approach”

Outcomes / Feedback:

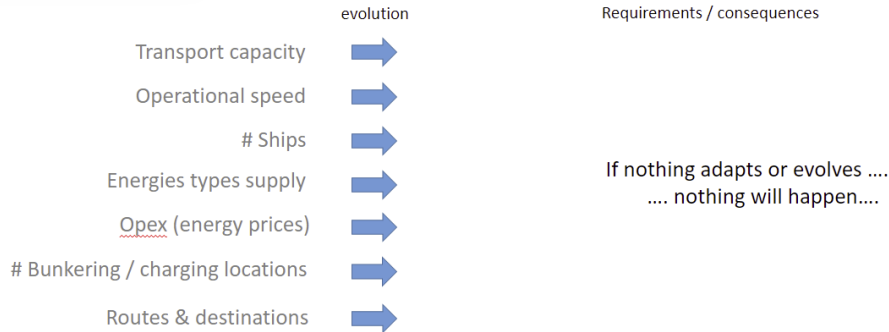
During that session, only the generic model was presented as well as the expected possibilities of the simulation framework. No simulation were yet performed at that time.

The workshop of the afternoon focused on asking several questions to the participants and launch discussions about the potential use of the framework in the future.

The following slide was used to open the discussions and create interaction between participants.



Needs **PARAMETERS**
 Development of the generic techno-economic model of the energy - harbor infrastructure – waterborne transport ecosystem



We already anticipated that each scenario and strategy would need to modify certain parameters in order to adapt to the constraints of sustainable alternative energy carriers (less energy density, higher price, reduction of range, investment for refit, scarcity of bunkering, ...).

We wanted to hear from the audience which parameters they would be prepared to play with in order to create alternative pathway.

The discussion showed that it was globally difficult for all participants to make the choice between parameters that were obviously inter-dependent. The discussion simply illustrated the current difficulty in selecting scenarios as each decision would depend on the evolution of other parameters and variables that were outside each other span of control.

An interesting discussion was also launched around the theme of market incentives on one side and regulation on the other hand.

Interesting enough, the same discussions raises within the NEEDS consortium when we started to elaborate the scenario’s for each region. The STTERER Expert Group meeting was a good preparation of that phase as a matter of fact.

2.3 MARIN 2022 R&D Seminar

- Seminar:** Blue Growth and Zero Emission
- Date:** 2 November 2022
- Location:** Wageningen, the Netherlands.
- Audience:** 140 participants on site.

During this day MARIN’s new research programs on Zero Emission Shipping, Safe Operations & Human Factors, Autonomy & Decision Support and Blue Growth were presented.



Within these programs MARIN works on their mission to make ships cleaner, smarter and safer, and to contribute to a sustainable use of the sea.

Presentation by Guilhem Gaillarde (MARIN):

“R&D Day - NEEDS project” (in Dutch)

Outcomes / Feedback:

Lots of comments from the audience on how ambitious was this development and if we were confident to be able to make it a reality. Several remarks focused on the possible challenge to integrate future evolution of price for example and how to keep the databases up to date.

2.4 NEEDS Workshop for IWT experts and stakeholders

Workshop

Date: 15 December 2022

Audience: 13 online participants

This workshop was organised for the IWT part in WP1 & WP3. It was a communication event in which we invited experts from CCNR secretariat, DST (SN network) and IWT Platform representatives to inform them about the NEEDS project and to receive input to the model and IWT application.

Outcomes / Feedback:

The main outcome was that the model approach was validated by the invited external experts and stakeholders. Presentations were made on the WP1 generic model and the WP3 model approach specifically for the Rhine region for inland navigation.

The model for IWT was presented in detail, including the specific settings and assumptions regarding the representative fleet families, journeys and sources for the costs and operational elements and the scenarios to be simulated.

It was agreed to align with the CCNR studies (<https://ccr-zkr.org/12080000-en.html>) for the energy transition as much as possible, meaning the preparation of a business as usual scenario, a conservative scenario with emphasis on ‘drop-in’ solutions and a innovative scenario with emphasis on electrification of vessels. Moreover, the NEEDS scenarios should at least aim for reaching a 90% emission reduction by 2050 compared to 2015.

CCNR suggested to add also add passenger vessels into to model. This was followed up by means of contacting the transport operators involved in passenger (cruise) vessels, but unfortunately this did not result in sufficient data which could be made public for the simulations in the WP3.



2.5 IACOSSS

Conference: International Academic Conference On Shipping, Sustainability & Solutions
Date: 2 March 2023
Location: Hamburg, Germany.
Audience: 100 expected on site participants.

Presentation by Antoine Bedos (MARIN); Jaume Hernandez (MARIN) also present:

“Modelling and evaluating energy transition scenarios for the European waterborne transport”

Outcomes / Feedback:

This conference was largely concerned with logistics in the shipping industry. At the time of the presentation there were no hard model results from the Rhine or the Greek region, so the focus of Antoine’s presentation was a general description of the NEEDS model. Two parallel sessions were held, with approximately 80 people from universities and research institutions with technical and financial knowledge, attending the presentation. Positive feedback was received during the coffee breaks.

Other presentations in the conference showed models that focussed on an end point regarding energy carriers, and these models were used to investigate social and economic means of getting there. These agent-based models used fleets as their smallest component and were run on a global scale.

In contrast, the NEEDS techno-economic model is driven by technical considerations and the economics of the energy transition. (It does not include society-driven aspects, though some simple features were implemented after the conference.)

The NEEDS model is also an agent-based model where, for example, ships are elements which behave on their own, but also interact and react with other elements such as harbours and fuel prices. Using individual ships as elements enables MARIN to incorporate its technical expertise in ship hydrodynamics and power systems into the model. The ship components were used to build fleets, and the model run on a regional scale in a dedicated model.

There were comments that there are limits of targeted and regional models. For example, energy production is not carried out for a single purpose. This lead to suggestions that a simple model for energy production can be adopted, and that energy sources can be connected to other sectors, for example, by considering the transport of energy or the location of energy production.



2.6 NEEDS Public Workshop

Workshop

Date: 13 September 2023

Location: Wageningen, the Netherlands.

Audience: 60 registered participants; 15 on site and 45 online from 14 countries.

NEEDS panel: Guilhem Gaillarde (MARIN), Giancarlo Marelli (MARIN), Lefteris Sdoukopoulos (Hellenic Institute of Transport), Martin Quispel (EICB), David Abril (Waterborne), Christian Norden (Balance), Michiel Katgert (MARIN), Jaume Hernandez (MARIN) and Agathe Rialland (SINTEF).

The aim of this workshop was twofold:

- To present the NEEDS model, the framework and the results, and in particular, the application cases developed on the Rhine region for inland waterways transport and the Greek inter-island maritime network for ferries and short-sea shipping;
- To define a so-called “Workshop scenario” for a future model;
- To Identify interested parties who would like to form an expert user-group and keep collaborating, developing and using this simulation framework.

Presentations:

- “NEEDS Simulation framework, a dynamic techno-economical model” (Michiel Katgert, MARIN)
- “Presentation of scenarios for the Rhine region & results” (Martin Quispel, EICB)
- “Presentation of scenarios for the Greek region & results” (Lefteris Sdoukopoulos, Hellenic Institute of Transport)
- Interactive “QandR” discussion (Michiel Katgert, MARIN)



NEEDS panel: (Back, left to right: Guilhem Gaillarde (MARIN), Giancarlo Marelli (MARIN), Lefteris Sdoukopoulos (Hellenic Institute of Transport), Martin Quispel (EICB), David Abril (Waterborne), Christian Norden (Balance), Michiel Katgert (MARIN). Front, left to right: Jaume Hernandez (MARIN), Agathe Rialland (SINTEF).



Outcomes / Feedback:

General comments and queries were received online regarding the operation and set up of the NEEDS model (e.g. time resolution of the model, methodology for assessing low water scenarios in summer, sources of reference values of CO₂eq for the different fuels, etc.).

Guilhem (MARIN) pointed out that a lot of information is provided in the project portal.

University of Southampton:

Is it possible to add social acceptance into the model? For example, can consumers pressure force the use of low emission transport? Now we see mainly political acceptance. It might be useful because some shipping companies are / are not willing to pay extra for green options.

Response from NEEDS panel: It's currently manually entered into the model. The question remains open whether it should be linked in policy makers (which is related to social opinion).

DAMEN:

Is it possible to include the movement of vessels into / out of a simulated region?

Response from NEEDS panel: It is not yet possible but we could add such option. Ships could then enter (from outside) the region, and leave it again via sort of "exit/entry" points. However, the addition of vessels is tricky. For example, how do we go about choosing a second vessel? Is it possible / permitted in the context of extra maintenance and docking, infrastructure etc..

University of Southampton:

Why are there no options for ammonia?



Response from NEEDS panel: Policy makers consider ammonia too dangerous so they have dismissed it for inland shipping on safety grounds.

Response from participant: Port of Basel launched a study to assess the opportunity of ammonia (including safety concerns).

Response from participant: One study on ammonia for IWT is already published (unfortunately only in German):

https://www.ikem.de/wp-content/uploads/2023/06/20230620_CF08-Studie.pdf

Also a shorter fact sheet:

https://www.ikem.de/wp-content/uploads/2023/06/20230620_CF08-Factsheet.pdf

ENGIE SA:

Can cost elements like carbon taxes, or subsidies over time be included in the model?

Response from NEEDS panel: They're already added. The price per kWh energy (for all type of energy carriers) can be specified, also in the future. So, effect of price fluctuation (based on taxes for example) is present in the simulation

Other comments:

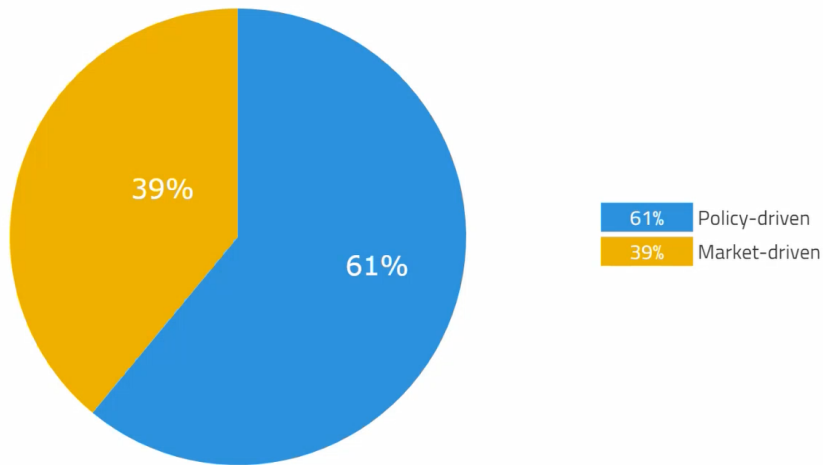
- Crew availability is not included the NEEDS model.
- The NEEDS model uses a rolling 5-year weather scenario. This doesn't take climate change into account.
- Is wind power an option?
- There is a need to account for the time spent waiting to receive electrical charge. Battery swapping options could also be an option.
- *Answer from participant: We can feed the Condor BUCA (developed with Rabobank) into the model and see the outcome. Very interesting to see.*
- Suggestion received to add CO2 per tonkm.
- *from participant: requests a copy of the report and slides. Response: reports will be uploaded when approved by the EU.*

Outcomes / Feedback from the "Workshop scenario" definition

Michiel Katgert (MARIN) presented an interactive "QandR" discussion which allowed on site and online participants to express their thoughts digitally. The presentation took the form of 7 questions where answers were recorded and discussed.



The simulation should be....



16

users in session

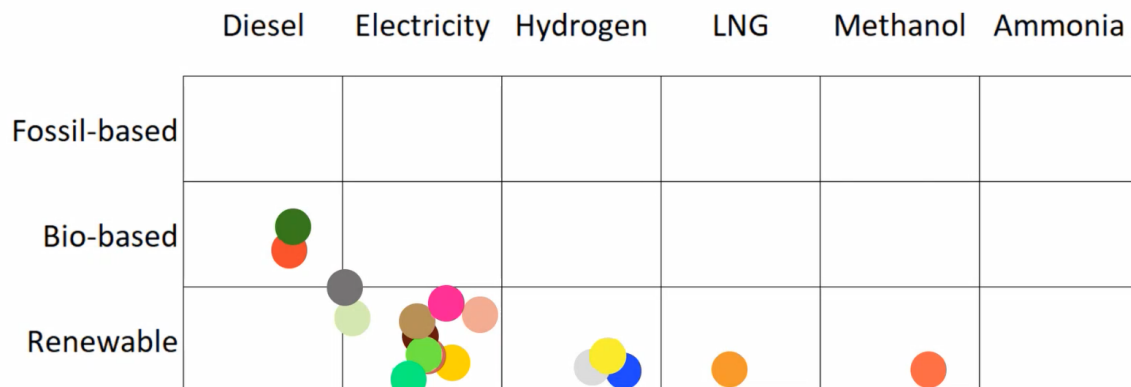
18

users answered

QANDR.EU
1858



Which energy carrier do you expect to be (still) dominant in 2050



17

users in session

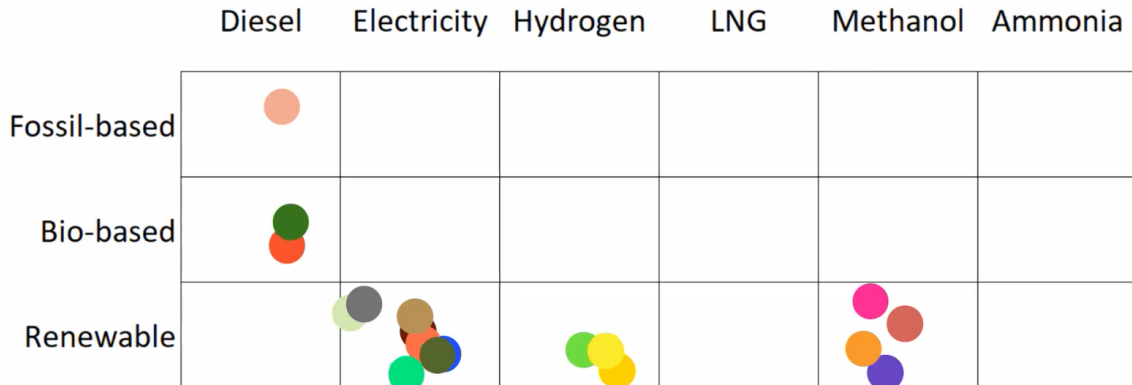
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points moved

QANDR.EU
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Which energy carrier do you expect to be (still) dominant in 2050



16

users in session

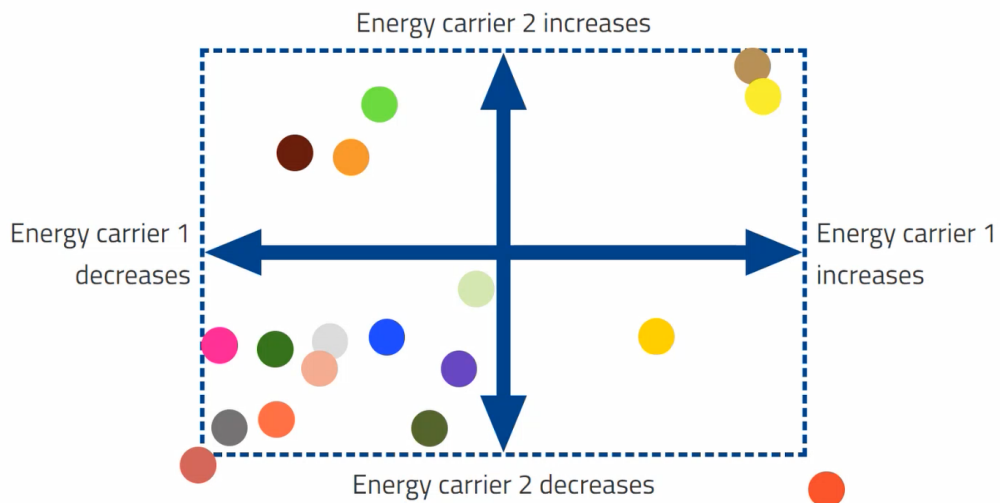
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points moved

QANDR.EU
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Expected price development



21

users in session

18

points moved

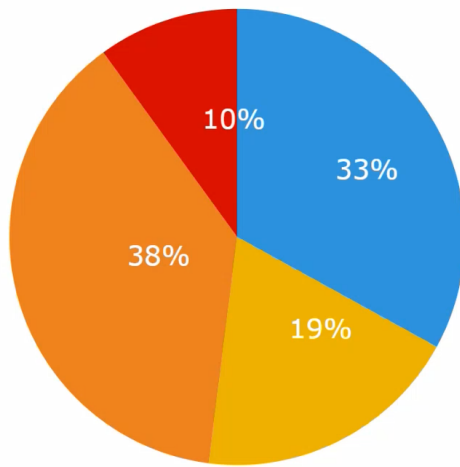
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Energy carrier 1 = Renewable electricity

Energy carrier 2 = Renewable methanol



What is your preferred strategy for transport?



- 33% Slow steaming and increase number of ships to keep transport capacity
- 19% Keep average speed and increase number of ships to keep transport capacity
- 0% Increase speed to increase transport capacity
- 38% Slow steaming and accept drop in transport capacity
- 10% Other

22

users in session

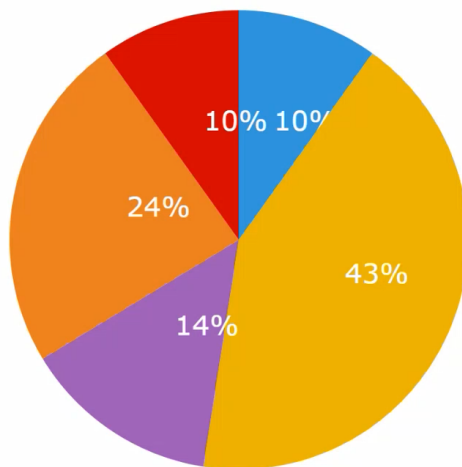
21

users answered

QANDR.EU
1858



Which functionality would you consider important for the simulation model



- 10% Connection to road network
- 43% Connection to bunker infrastructure
- 14% Model impact of electricity generation
- 24% Energy carrier price varying on supply and demand
- 10% Other

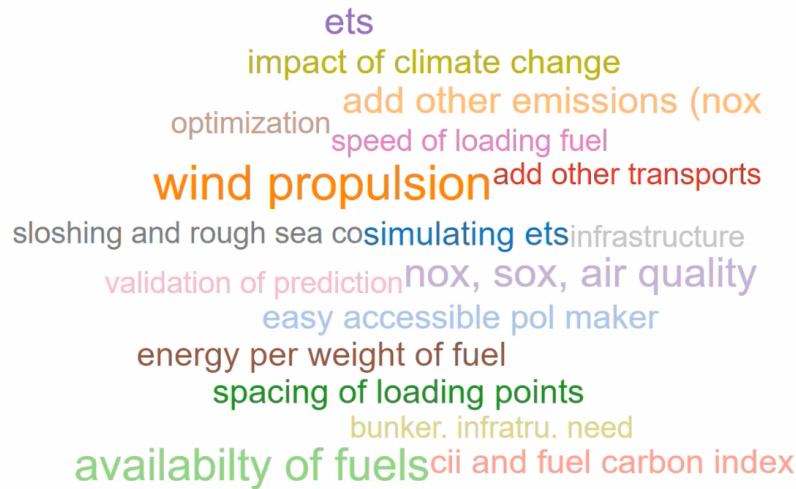
19

users in session

21

users answered

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22

users in session

40

words added

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1858

Summary of Workshop Scenario (based on majority of responses):

- The simulation should be policy-driven rather than market-driven.
- The 2 energy carriers expected to (still) be dominant in 2050 are renewable electricity and renewable methanol.
- The expected price development for renewable electricity and renewable methanol is a decrease in each of these energy carriers.
- The preferred strategy for transport is slow steaming and accept drop in transport capacity.
- The functionality considered important for the simulation model is connection to bunker infrastructure (other functionalities are also suggested).

Interested Parties in Further Collaboration

Guilhem Gaillharde (MARIN) invited interested parties to express their interest in joining a follow-up user group. He explained that by joining the future user-group of NEEDS, participants will be able to take part in the development and decision of new functionalities and possibly run simulations as well (full simulations including creation of different regions/systems/fleet, or only on the scenario side with pre-prepared models).

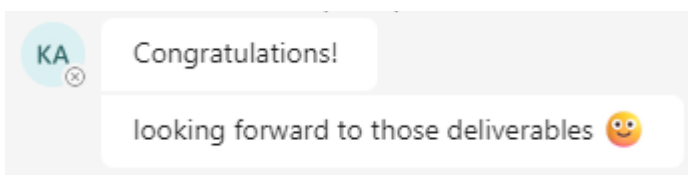
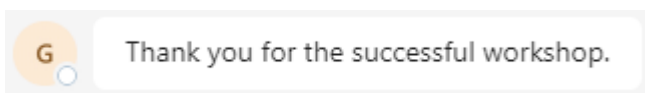
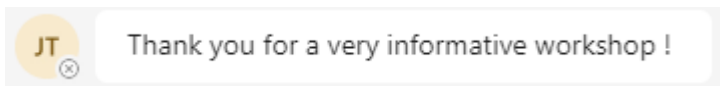
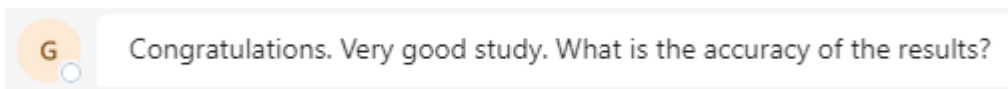
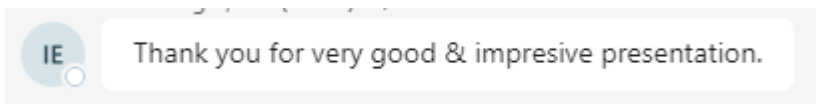
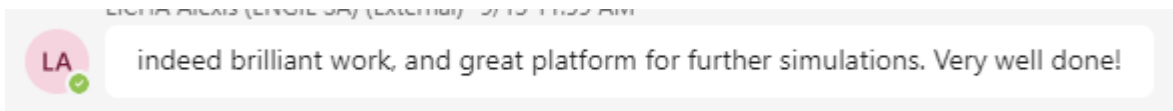
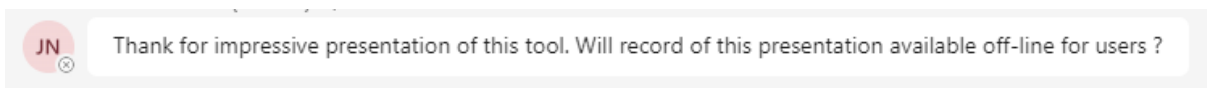
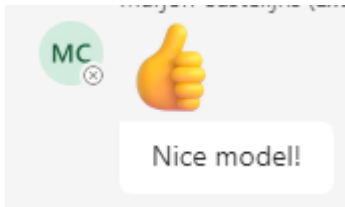
Responses to the call could be made during the meeting, and also made privately or via email to Guilhem Gaillharde (MARIN). Guilhem confirmed to the University of Southampton (UK) that the user group will be open to non-EU members.

NEEDS team members present at the workshop (from SINTEF, EICB, Hellenic Institute of Transport, Balance, Waterborne and MARIN) took the opportunity to express their positive experiences with their collaboration with each other to date, and also their enthusiasm to continue working with the NEEDS model within the follow-up user group.



Positive comments about the public workshop:

There was lots of positive feedback about the NEEDS model from both online and onsite participants.



3. Consultation outputs

Consultation name	Output type	Filename or link
EU Shipping BCE	Presentation	EUShippingBCE_SdoukopoulosGaillarde.pdf
	Presentation (Video; begins 4:48)	https://www.eu-shipping-bce.com/videos-2/



STEERER Expert Group Meeting	Presentation	2022-09-21 NEEDS presentation - STEERER GSEG meeting - Bruxelles.pptx
MARIN 2022 R&D Seminar	Presentation	R&D dag - NEEDS presentation.pptx
IACOSSS	Presentation	Bedos, Antoine_2.1_Modelling and evaluating energy transition scenarios for the EU waterborne transport.pptx
	Conference proceedings (See p180)	SSS2023_Conference_Proceedings.pdf
TRB Marine Environment Committee	Presentation	NEEDS overview - TRB Marine Environment Committee 22 june 2023.pdf
NEEDS Public Workshop	Presentation; introduction	NEEDS workshop -230913_Introduction.pptx
	Presentation; simulation framework	NEEDS Workshop 230913_Simulation framework presentation.pptx
	Presentation; Rhine region case results	NEEDS Workshop 230913_Rhine region case results_EICB.pptx
	Presentation; Greece region case results	NEEDS Workshop 230913_Greece region case results_CERTH.pptx
	Presentation; Scenario simulation framework	NEEDS scenario simulation framework - Extensive description.pptx
	Video of presentations	MicrosoftTeams-video.mp4
	Video of QandR interactive session	MicrosoftTeams-video-QandR.mp4
	Visuals of QandR interactive session	visuals_NEEDS Public Workshop_Live session 13-09.pdf



4. Summary

The NEEDS model has been presented at different stages of its development to a variety of audiences next to the STEERER Network members, that include those with technical, financial, and policy knowledge. Feedback has been positive, and suggestions and comments received for (future) functionality.

All parties in the NEEDS consortium have responded positively to a call for joining a follow-up user group where participants can determine which of these (and other) functionalities to include and develop, and possibly run simulations. Additional members are also welcome to join. The continuation of the NEEDS project in the follow-up user group means that improvements can be made to the existing models, and also raises the possibility that additional regional models can be set up and simulated.