




High Efficiency Low Emission Nautical SOFC

D9.1 Dissemination, Exploitation & Communication Plan

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Glossary of terms

Term	Description
Teamsites	Internal project management and file sharing platform at https://teamsites-extranet.dlr.de/sites/helenus/ (accessible by HELENUS partners only)

List of abbreviations and acronyms

Abbreviation	Meaning
CA	Consortium Agreement
D / Del	Deliverable
D&C	Dissemination and Communication
DE&C	Dissemination, Exploitation, and Communication
EC	European Commission
EU	European Union
HE	Horizon Europe
IPR	Intellectual Property Rights
KPI	Key Performance Index
MS	Milestone
PO	Project Officer
PC	Project Coordinator
PMT	Project Management Team
R&D	Research and Development
SOFC	Solid Oxide Fuel Cell
WP	Work package

Executive Summary

The present document is the D9.1- Plan for dissemination, exploitation, and communication, which is prepared within WP9 of the HELENUS project. HELENUS will demonstrate the potential of solid oxide fuel cells (SOFCs) in decarbonizing shipping through highly efficient onboard cogeneration of power and heat. A 500 kW SOFC will be demonstrated onboard an ocean-going cruise ship by 2027, and applicability, scalability, and fuel-flexibility of the developed SOFC system over a wide range of maritime applications will be demonstrated through laboratory testing of a 100 kW module. It is expected that the project by reaching its goals will facilitate increased, and scaled-up demonstrations of SOFCs in various maritime applications.

In order to realize the expected impacts of HELENUS, stakeholders from various sections of the maritime and energy system circles need to be made aware of the motivation, goals, and expected impact of the project. Communication, dissemination, and exploitation activities play a crucial role in ensuring this knowledge and technology transfer to the stakeholders. Different phases of the project require different themes of outward projection to maximize the impact of the project. The objective at the beginning of the project is to make the society at large aware of the project including the motivation, goals, and expected impacts, while the key objectives change to knowledge transfer and dissemination during the project, and exploitation of the results at the end of the project.

This deliverable outlines the key DE&C activities identified by the consortium to maximize the impact of the collaborative work that will be undertaken within HELENUS. The various avenues for DE&C including target KPIs are determined. D&C activities will predominantly lie under the scope of the project, with the Exploitation process mostly following the end of the project. The DE&C activities will be the responsibility of each individual partner, who will strive to showcase their work to appropriate audiences throughout the duration of the project. DLR, as the WP9 leader, will track and coordinate the processes to ensure completeness and complementarity of the messages delivered by HELENUS.

The DE&C plan is the best estimate of all activities as planned at the beginning of the project. The plan will remain a dynamic document that will be continuously reviewed and updated throughout the project.

1. Introduction

1.1 Purpose and scope

This document contributes to D9.1: Dissemination, Exploitation, and Communication (DE&C) Plan for the HELENUS project. This plan outlines the plan that the HELENUS consortium aims to follow in order to achieve the expected impacts of the project. This plan details the target stakeholders and the expected impact on them, and describes several avenues to broadcast the project goals, progress, and results to these target groups. This document provides an initial plan as foreseen at the start of the project, and will be continuously updated.

This document is organized in seven sections. Section 2 describes the various target groups and the overall project strategy for DE&C. Section 3, Section 4, and Section 5 describe the various communication, dissemination, and exploitation activities planned by the different project partners. Section 6 highlights the implementation of the DE&C plan, and Section 7 concludes the document.

1.2 Intended readership

This deliverable is disseminated internally, within the project consortium. The intended readership comprises the members of the HELENUS consortium and the European Commission Project Officer (PO) of the HELENUS project. It will be of high interest for the consortium members to use it as a point of reference for all issues related to the HELENUS dissemination, exploitation, and communication.

1.3 Relationship with other HELENUS deliverables

This deliverable is the central document of WP9: dissemination, exploitation, and communication, contributing to Task 9.1. This document lays a blueprint for the execution of tasks 9.2, 9.3, and 9.4 over the course of the project. The results from every other deliverable on all other HELENUS WPs will be analysed for DE&C to maximize the impact of the knowledge generated during the project

2. Target Audience and Strategy

2.1 Target Audience

Results from the HELENUS project will have a strong impact on several sectors of the European maritime industry - including ship builders, ship operators, class societies and regulatory bodies, as well as research institutes and the general public. Table 1 describes the impact that HELENUS targets to have on various groups.

Table 1: Target groups and expected impacts

Target group	Impact on target group
Fuel cell suppliers	<ul style="list-style-type: none"> • SOFC system development has so far been limited to “retrofit” solutions, since most of the demonstrators involve containerised solutions. <i>HELENUS</i> will create knowledge and expertise in the development of integrated SOFC solutions for newbuild ships, including system certification and subsequent commercialisation. <i>HELENUS</i> will strengthen knowledge of fuel cell suppliers on implementation of different renewable/carbon-neutral fuels in various ship types. • There are presently no commercial solutions for high power SOFCs in maritime applications. Success of this project will enable fuel cell suppliers to commercialise multi-MW maritime SOFC systems. This will subsequently lead to fostering EU competitiveness and innovation, creating new jobs, and boosting the European economy.
Shipyards	<ul style="list-style-type: none"> • The valuable experience gained from <i>HELENUS</i> on-board demonstration will ease the certification process for future integrated SOFC system installations in large ships. • <i>HELENUS</i> will help shipyards to plan for SOFC system installations in newbuild ships, decrease time to commercialization and implementation, and prepare for multi-MW SOFC implementations in future class ships, which is a critical step towards zero-emission shipping. The project will lead to the design and delivery of new class ships by 2029-2030, thereby exceeding the 2030- and European Green Deal- emission reduction requirements • This project will help in maintaining the competitive edge of the EU shipbuilding industry in terms of energy and environmental efficiencies in highly complex products such as cruise ships and foster the energy transition of their business, especially against newcomers from other global markets.
Ship operators	<ul style="list-style-type: none"> • <i>HELENUS</i> will enable ship operators to gain experience with operating such technology onboard, increasing their confidence in adopting large-scale commercial products in the future. • Adoption of clean technology will enable the ship industry to enhance Customers’ Corporate Environmental and Social Responsibility policies.
Cruise ship industry	<ul style="list-style-type: none"> • The cruise ship industry particularly stands to benefit from widespread adoption of clean technologies. The public is generally more sensitive to environmental issues, and will be more inclined to sail onboard clean cruise ships. Reduction in ship vibration and noise in scaled-up solutions will further improve customer experience.

	<ul style="list-style-type: none"> • This project can also transform the image of the cruise industry and attract new clients looking for sustainable tourism/cruises. • Widespread adoption of SOFCs in cruise ships will certainly cascade in the whole maritime transport.
Renewable fuel producers	<ul style="list-style-type: none"> • Successful demonstration and commercialization of a fuel-flexible maritime chemical energy convertor would provide a strong impetus for renewable fuel producers and suppliers to invest in port- and fueling infrastructure, enabling faster transition of the industry to renewable fuels. • This project will quantify the lifecycle performance, costs, and emissions of renewable/carbon-neutral fuels with SOFC technology, using LCA/LCPA tools.
Policy-makers & regulators	<ul style="list-style-type: none"> • This project promotes technology awareness among policymakers, and give them better understanding of the potential environmental benefits, impacts, and pitfalls of this emerging technology. • The project will provide feedback on the use of the expected IMO Interim Guidelines for the safety of ships using fuel cell power installations. • The results will provide a framework for regulators to meet the objectives of both climate and industrial public policies, and invest significantly in the research, development, and industrialization of multi-MW fuel cells.
Classification Societies	<ul style="list-style-type: none"> • Technical results will help class societies assess the safety of maritime SOFC systems, and formulate prescriptive rules for safe and reliable maritime SOFC system design and integration. • The results of this project will provide feedback about existing Classification Rules for fuel cells and their integration onboard, and foster the edition of European class rules for marine fuel cell technology and speed up the classification of ships equipped with such equipment.
Research Institutes	<p>The project will validate theoretical scientific concepts for advanced fuel cell technology on both small- and large- scales, and enable the creation of more knowledge about the operational demands of specific maritime applications to define the direction of future research. Moreover, the knowledge gathered in the project will eventually find a place in future student teaching and training activities.</p>
General Public	<p>With the cruise ship industry being the most “public-facing” among maritime industries, this project will enable public awareness about the efforts taken by the EU, as well the maritime industry, in driving decarbonisation. This project will also spread awareness in SOFC technology. Increased public interest and acceptance can also cascade to other industries and sectors.</p>

2.2 D&C channels specific to different stakeholders

The HELENUS consortium has identified various channels for the dissemination and communication of results to the various stakeholders, as described in Table 2. This plan will evolve as the project progresses and will continue to be updated.

Table 2: Dissemination plan to various target groups

Dissemination objectives	Channels for dissemination and communication
Maritime industry: Shipyards, ship operators, harbours, engineering offices, consultancies, etc.	
<ul style="list-style-type: none"> • Raising awareness of SOFC technology and alternative fuels • Economic and ecological motivation behind transitioning towards high efficiency fuel-flexible energy converters • Strategies for system integration and operation of SOFCs within complex ship energy systems 	<ul style="list-style-type: none"> • Seminars/webinars • Presentations at conferences, exhibitions, and trade fairs • Scientific publications • Technical reports • Professional network platforms such as LinkedIn
Policymakers, Regulators, and Classification Societies	
<ul style="list-style-type: none"> • Promoting technology awareness, including benefits, limitations, and environment benefit, and broader impact of SOFCs and clean fuels in ships • Create awareness of the lead for lifecycle analysis for future regulatory frameworks • Communication of research, regulatory, and policy needs to transition towards a sustainable green economy • Guidelines and strategies for SOFC system safety and operability to enable ship integration 	<ul style="list-style-type: none"> • Dedicated workshops • Publication of guidelines • Press releases • Contribution to the extension of IGF Code including alternative fuels ammonia, methanol or hydrogen
Academic and research community	
<ul style="list-style-type: none"> • Communication of state-of-the-art and research needs, to ensure that academic research aligns with goals of the industry and society • Demonstrating the commitment of the maritime industry towards a green future to recruit top talent to work within the industry 	<ul style="list-style-type: none"> • Open access scientific publications • Conference presentations • Guest lectures at universities and schools • Conference presentations • Invitation to visit research facilities of one of the consortium members for laboratory tours • Career fairs (both in-person and virtual) • Online professional networking platforms
European and international networks	
<ul style="list-style-type: none"> • Demonstrating European advancement and innovation in clean technologies 	<ul style="list-style-type: none"> • Articles and presentations on network platforms

<ul style="list-style-type: none"> • Accelerate the implementation of fuel cells in the maritime market 	<ul style="list-style-type: none"> • Press releases • Public deliverables • Technical magazines • Scientific publications and conference talks
General Public	
<ul style="list-style-type: none"> • Generate awareness of the steps being taken by the maritime industry (specifically cruise ship industry) to transition to a green future. • Generate public interest and awareness in SOFCs as alternative clean energy converters 	<ul style="list-style-type: none"> • Project website • Social media presence • Participation in technical podcasts/ radio talks on clean energy transition • Project video, brochure, press releases

2.3 D&C strategy

The HELENUS project will run for five years between 2022 and 2027. As disseminable project results can be generated only during the course of the project, the D&C activities will focus on the transfer of appropriate knowledge available at relevant stages of the project, to cater to a wide range of audience with different messages. The D&C activities of HELENUS will be carried out in three phases, as described below and illustrated in Figure 1. The various planned D&C activities, their avenues, and KPIs are elaborated later in Chapter 3 and Chapter 4 .

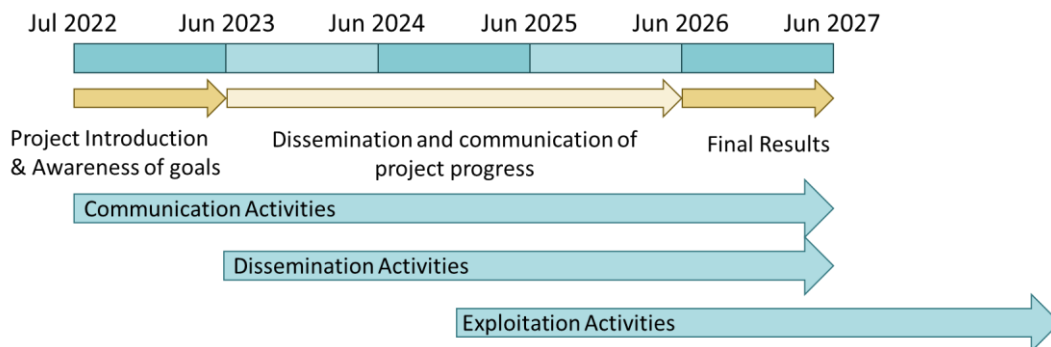


Figure 1: D&C strategy and timeline

2.3.1 Project introduction and awareness of goals

The first phase of the D&C activities focuses on introduction of HELENUS and its goals to the public, particularly the target groups described above in Table 1 and Table 2. This phase will last for one year following the start of the project, until June 2023, and will consist of exclusively “communication”-based activities. The key communication message will centre around the foreseen role of HELENUS in realising the potential of solid oxide fuels in decarbonising shipping, and the capability of the consortium to effectively execute the project. This phase involves the creation of a brand identity for the project to create a distinct external image of the project consistent with the project goals, including a colour scheme, project logo, templates for presentations and reports, brochures, newsletters, etc. Additionally, an online presence will be created in the form of a project website and social media, and initial communication material will be released in the form of press releases, social media posts by consortium members, introduction of HELENUS in partners’ long-term strategies and goals, contributions to articles, etc.

2.3.2 Dissemination and communication of project progress

The second phase of the D&C activities will be carried out in years 2,3 and 4 of the project, between July 2023 and June 2026. This period includes the generation of several novel datasets and results across the various work packages, and the D&C activities will focus not only on the dissemination of the results to the various stakeholders, but also the continued communication regarding the interpretation of the disseminated results within the bigger picture of maritime decarbonization. The dissemination activities in this phase include the publication of scientific papers, conference presentations, technical workshops, webinars, technical reports, and guest lectures. The key communication activities during this phase will include the periodic update of website to reflect the new results and dissemination activities and continued social media posts, besides news articles and press releases reflecting major project milestones.

2.3.3 Project completion and exploitation

As the project enters its last year, involving field-testing of the SOFC onboard the vessel, with most other research and analysis activities having concluded, the final results will be extensively disseminated in the form of journal papers and workshop organisation. The dissemination activities will increasingly focus on preparation for the planned exploitation activities following the conclusion of the project. A business plan will be developed to outline the commercial activities planned between the partners to further the use and scale-up of SOFCs in various maritime applications. Communication activities will continue alongside the dissemination and initial exploitation activities to continue to make the various stakeholders aware of the project outcomes. The scope of the DE&C within HELENUS will conclude with the end of the project, however, the exploitation activities will be carried out by the partners independently or as a part of follow-up consortia for several years after the conclusion of HELENUS.

3. Communication Plan

3.1 Brand Identity

A brand identity has been created for HELENUS to create distinct project visibility, and enable uniform and consistent appearance of all dissemination and communication material of HELENUS. This includes the creation of a colour scheme, project logo, and templates for reports, presentations, newsletters, etc. for use in all digital and print media.

3.1.1 Colour scheme

A colour scheme of turquoise and golden yellow has been chosen for HELENUS, wherein blue is representative of water, and yellow is representative of energy. This colour scheme also enables an elegant presentation of the project materials in both the digital and print media. The project colour scheme with the RGB, CMYK, and HEX codes is shown in Figure 2.




	RGB: R: 63, G: 156, B: 168 HEX: #3F9CA8 CMYK: C: 63%, M: 7%, Y: 0%, K: 34%
	RGB: R: 220, G: 181, B: 57 HEX: #DCB539 CMYK: C: 0%, M: 18%, Y: 74%, K: 14%
	RGB: R: 43, G: 47, B: 49 HEX: #2B2F31 CMYK: C: 12%, M: 4%, Y: 0%, K: 81%

Figure 2: Colour scheme of HELENUS

3.1.2 Project Logo

Figure 3 shows the full HELENUS logo in colour version, using the colour scheme described above. The logo is a yellow lightning over a sea-blue anchor, representing SOFC-based electrification of maritime applications. The colour version is the default version of the logo, and will be used wherever possible. The text “HELENUS” in this version uses the shade of black described above in Figure 2.



Figure 3: Colour version of the HELENUS logo

Additionally, the logo has also been developed in full- black- and full- white- versions, as shown in Figure 4 and Figure 5, respectively. These logo versions may be used on any light and dark backgrounds, respectively, where the default colour logo cannot be elegantly used. The black logo is particularly useful for print media that cannot be printed in colour.



Figure 4: Black version of the HELENUS logo



Figure 5: White version of the HELENUS logo (applicable to any dark background)

Shortened versions of the HELENUS logo without the “HELENUS” name will be used where appropriate. This includes usage on online profiles including the social media (LinkedIn) page, where the profile pictures are in a nearly 1:1 aspect ratio (either circular or square-shaped), as well as on the individual slides of the presentation template, to enable maintaining the project identity with minimal footprint. The shortened logos in colour, black, and white, are shown in Figure 6.



Figure 6: Symbolic logo versions of HELENUS in colour, black, and white

3.1.3 Slide deck templates

The HELENUS brand identity has also been implemented on all reports and presentation templates, and shared with the team on the Teamsites page. The templates for reports is similar to that of this deliverable report, including the project logo and the logo of the EU in the header. The template for the presentation is shown below in Figure 7, featuring the full HELENUS logo, the EU emblem, and the presenter logo on the title slide, and the shortened HELENUS logo and EU emblem on each of the content slides.

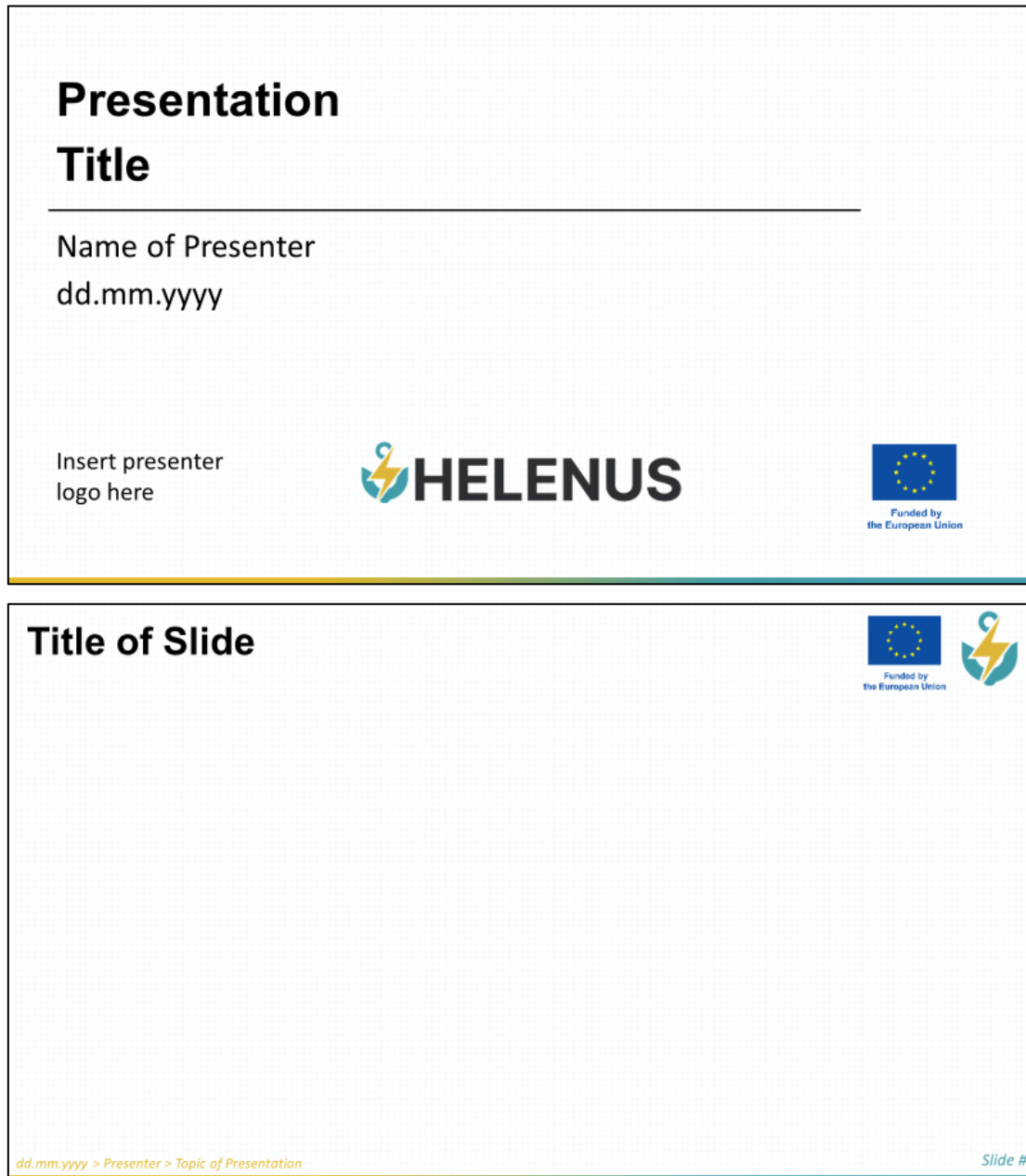


Figure 7: Template for HELENUS Slide Deck

3.2 Website

A project website is being developed to introduce the project, describe its goals, approaches, and partners, and showcase the latest developments including public results, publications, newsletters and conference presentations, to the various target groups described in Table 1. The website is currently under development, and expected to be launched in early January 2023 with a domain name www.helenus.eu. The website is being developed using a Wordpress template with a colour scheme of turquoise-white colour scheme, and will be hosted on a DLR LAMP server. Figure 8 shows the home page of the website.

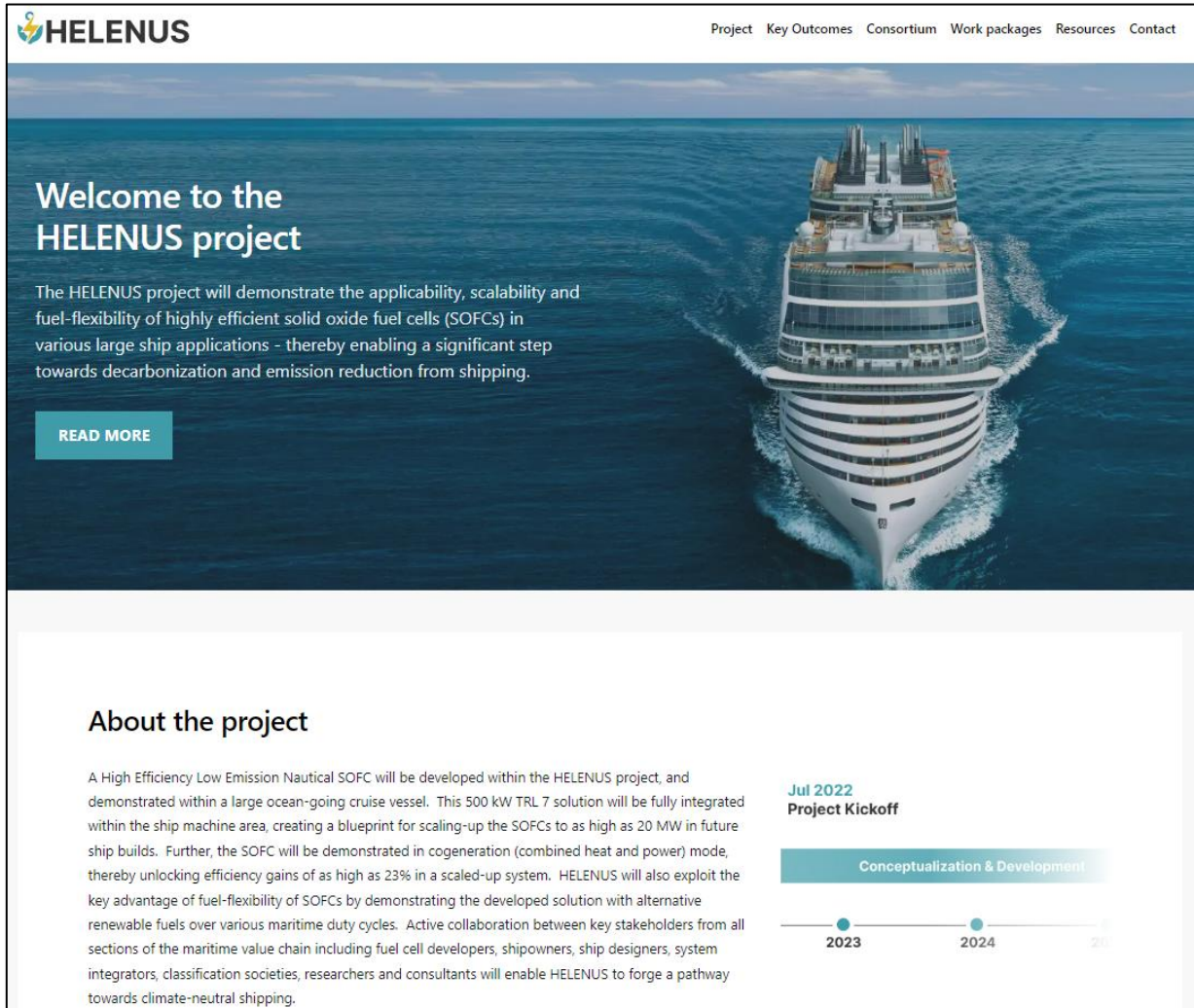


Figure 8: HELENUS project website

As can be seen from Figure 8, the HELENUS website will include 7 pages, which are described below.

1. **Landing page** – This is the home page of the website, containing teaser text of the project. It is A 60-second project presentation video will subsequently be integrated into the home page
2. **Project** –The HELENUS project, including the timeline, are described and elaborated here.
3. **Key Outcomes** – This page describes the main expected outcomes from the project, as also described in the Grant Agreement.
4. **Consortium** – The HELENUS consortium partners and their role in the project is described here
5. **Work Packages** – This page describes the 9 WPs of HELENUS, including the main goals, involved partners, and scheduled public deliverables and milestones.
6. **Resources** – Various public dissemination and communication material, including newsletters, public deliverables, milestones, conference presentations, publications, etc. will be uploaded on this page.
7. **Contact** – A contact form is integrated in the website to allow site visitors to contact the project coordinator with any requests and questions.

The home page will be accessible from all pages via the HELENUS logo. The content of all pages is maintained by the WP9 leader: DLR, and will be maintained and updated regularly.

3.3 Social media

A HELENUS page will be created on the professional social media platform LinkedIn to communicate project updates and disseminate results to the various stakeholders of the project. This page will be launched alongside the website in January 2023. The LinkedIn page will also drive publicity of various ongoing and upcoming HELENUS DE&C events, to ensure maximum public participation. The WP9 leader, DLR, will be responsible for the HELENUS LinkedIn page.

The project partners will publicize the project on their organizational LinkedIn pages following the launch of the HELENUS website and LinkedIn page, and also post periodic social media updates on LinkedIn, Twitter, and Facebook, following key events/milestones within the HELENUS project. Some one-time and periodic HELENUS-related social media posts foreseen are listed below:

1. Launch of HELENUS Website and LinkedIn page (one-time)
2. Delivery of the two SOFC module demonstrators at DLR and CdA (one-time)
3. Periodic updates from SOFC module testing at DLR (periodic, once every quarter)
4. Providing information about life-cycle costs, life-cycle analysis, standardization needs and policy recommendations, based on WP7 and WP8 (periodic, once every month)
5. Consortium meetings (periodic, one every 6 months)
6. Building activities (periodic, as necessary)
7. Project deliverables and milestones, including posting own milestones, and sharing other partners' milestones (periodic, as necessary)
8. Webinars and presentations (periodic, as necessary)
9. Journal publications (periodic, as necessary)
10. Newsletter releases (periodic, as necessary)

A total of 60 unique LinkedIn posts are targeted over the duration of the project, with a success metric of 1500 unique views, 80 reactions and 4 shares, targeted for each post related to HELENUS on LinkedIn. A summary of partner-specific targets for social media posts are shown in Table 3.

Table 3: Social media contributions targeted during the project

Partner	Channels	Social media plan and KPIs
DLR	<ul style="list-style-type: none"> • LinkedIn 	Once a month, through the HELENUS account
ALMA	<ul style="list-style-type: none"> • LinkedIn • Facebook 	3-4 times a year <ul style="list-style-type: none"> • Success metric: 1500 unique views, 80 reactions and 4 shares, per post
TUD	<ul style="list-style-type: none"> • LinkedIn • Twitter 	6 over the project
CdA	<ul style="list-style-type: none"> • LinkedIn 	3 over the project
IHC	<ul style="list-style-type: none"> • LinkedIn • IHC Website 	4 or 5 over the project <ul style="list-style-type: none"> • Q1 2023 • Q3 2025 SOFC concept dredger • Q4 2025 SOFC concept offshore vessel • LCPA results dredger and offshore vessel
BAL	<ul style="list-style-type: none"> • LinkedIn • BAL Homepage 	1 per month from 2 nd project year

	<ul style="list-style-type: none"> • Twitter 	
WÄR		1 social media post per year
MSC		1 over the project
BV		1 over the project, expected 2024
IFEU	<ul style="list-style-type: none"> • LinkedIn • ifeu Website • Twitter 	1 per month from 2 nd project year

3.4 Project video

DLR will develop a 60-second introductory project video describing the goals, approaches, and expected impacts of the project. The video will be uploaded to YouTube, integrated in the landing page of the project website, and be shared on the HELENUS LinkedIn page. The video development will start in early 2023, with an expected launch by June 2023.

3.5 Press releases

Press releases, targeting Policymakers, Regulators, and Classification Societies, various European and International networks, and the general public, will be periodically issued by the HELENUS partners. A press release¹ was issued by ALMA on 15.09.2022 following the project kick-off meeting, describing their participation in the project and the project goals. Table 4 summarizes the press release targets of all HELENUS partners. Furthermore, a delivery ceremony will be organized by CdA and MSC at the CdA facility in France, highlighting the main innovations of the ship. Approximately 80 journalists are expected to attend this event, which will be widely covered in the media.

3.6 Magazines and blogs

The HELENUS consortium will also contribute to publications in technical magazines, periodicals, and blogs, to describe about the project and intermediate result to technically oriented audience. The HELENUS project has been referenced by MSC in a magazine article² on Riviera that appeared on 28.10.2022. The target publications in magazine articles by different partners is listed in Table 4.

Table 4: Press releases, magazine articles and blogs targeted during the project

Partner	Press release plan	Magazine Articles, Blogs, and Reports
DLR		2 publications
ALMA	Success Metric: 7 press releases, including, <ul style="list-style-type: none"> • 2022: 1 -project kick off • 2025: 1- Delivery of system 	Teknisk ukeblad or Skipsrevyen

¹ "EU-funded consortium aims to decarbonise cruise vessels", <https://almacleanpower.com/news/eu-funded-consortium-aims-to-decarbonise-cruise-vessels>, Published 15.09.2022 by Annette Frotjold, Accessed 27.11.2022

² "MSC cruise ship demonstrates fuel-cell technology", [Riviera - News Content Hub - MSC cruise ship demonstrates fuel-cell technology \(rivieramm.com\)](https://rivieramm.com/news/msc-cruise-ship-demonstrates-fuel-cell-technology), Published on 20.10.2022, Accessed 27.11.2022

	<ul style="list-style-type: none"> • 2026: 2 – Vessel running + operating hours • 2027: 1 – End of project 	
TUD	2 press releases, at the middle, and end of the project	3 publications in SWZ maritime, Technisch Weekblad or Schuttevaer
CdA	Ship delivery ceremony	2 publications, in Usine nouvelle and Mer et Marine
WÄR		6 magazine articles and blogs
MSC	2 press releases over the project	<ul style="list-style-type: none"> • 1 magazine article already published • Inclusion in MSC’s annual Sustainability Report
BV	1 press release in 2024	

3.7 Participation in career fairs

The HELENUS project will be showcased in various career fairs targeting students and researchers, where the consortium partners participate. This avenue communicates the project motivation, goals and objectives to the academic and research communities, enabling the recruitment of talented candidates who could eventually work on the project. The consortium has currently identified the following career fairs where partners could participate:

- Semi-annual DLR career fairs
- The Ocean Young
- Storm I et vannglass
- KDNTNU
- Springbrettet (Norwegian)

3.8 Visits and Tours of Research facilities

All the consortium partners have also offered to organize visits and tours of their research facilities, to demonstrate the usefulness of the HELENUS project in decarbonizing shipping. Experimental testing is particularly planned by DLR and TUD, and field testing onboard of a ship is planned by MSC and CdA. The exact details of these visits is yet to be determined.

- DLR is currently affiliated with University of Stuttgart and Hamburg University of Technology, and will host open-lab sessions for academics and researchers from these universities. Further, at least two visits to school students and community members will be held during the course of the project.
- ALMA, WÄR and TUD have also offered to arrange visits to their laboratory facilities during the relevant testing periods, for local universities and research centres.
- MSC will arrange one visit onboard the ship in which the HELENUS module will be tested during field operation.

3.9 Monitoring and KPIs for communication activities

The KPIs and success metrics defined for each avenue for project communication, as described in this Chapter, are summarized in Table 5.

Table 5: KPIs and success metrics for communication activities

Communication Channel	KPI targets
Brand Identity	<ul style="list-style-type: none">• 1 Logo, ready by M6• 1 presentation template, ready by M6• 1 report template, ready by M6
Website	<ul style="list-style-type: none">• 1 website, ready by M8
Social media	<ul style="list-style-type: none">• 60 unique posts• 1500 views/post, 80 reactions/post, 4 shares/post
Project video	<ul style="list-style-type: none">• 1 video, ready by M12
Press releases	<ul style="list-style-type: none">• 12 press releases
Magazines and blogs	<ul style="list-style-type: none">• 13 articles
Career fairs	<ul style="list-style-type: none">• 10 career fairs talking about HELENUS
Research facility visits	<ul style="list-style-type: none">• 4 visits

4. Dissemination Plan

4.1 Scientific publications

The HELENUS consortium will actively look to disseminate the results through publications in journals. The partners have identified the following journals to be of primary consideration, for submitting novel research resulting from the project.

- Journal of Power Sources
- International Journal of Hydrogen Energy
- Energy Conversion and Management
- Applied Energy
- Energy
- Controls Engineering Practice
- Frontiers in Mechanical Engineering
- International Journal of Electrical Power and Energy Systems
- Energies (MDPI)
- Journal of Electrochemical Energy Conversion and Storage (ASME)
- Wiley Library Fuel Cells
- Journal of Marine Science and Engineering (JMSE)
- International Shipbuilding Progress

It is planned that journal publications will be primary led by DLR and TUD, with other partners participating as co-authors when applicable. DLR and TUD aim to publish two unique journal publications each and two collaborative papers, based on the independent and collaborative research defined in WP3 and WP4. Therefore, a total of **six** unique journal publications are expected.

Table 6: Plan for journal publications

Partner	2024		2025	2026	2027	Total
DLR		1	1	1	1	6
TUD	1			1		

4.2 Conference presentations

The HELENUS consortium will attend various national and international conferences related to fuel cells, alternative/renewable fuels, and energy systems, and maritime decarbonization to disseminate key project results to the scientific and technical world. The conferences will also be used as avenues to network with other scientists, and exchange ideas that could enhance the implementation of HELENUS. Table 7 presents the names, numbers, and years for the various conferences that are targeted by the consortium partners. The partners will publish conference proceedings wherever possible.

Table 7: Plan for conference presentations

Partner	Conference names	KPIs
DLR	<ul style="list-style-type: none"> • European Fuel Cell Forum (EFCF) 2024 • Maritime Hybrid, Electric & Hydrogen Fuel Cells Conference, Bergen 2024/2025 	8 presentations <ul style="list-style-type: none"> • 2024: 2 • 2025: 2

	<ul style="list-style-type: none"> • Modelling and Optimisation of Ship Energy Systems (MOSES) 2025 • European Fuel Cells and Hydrogen Conference (ENEAC) • Ship Efficiency Conference (STG) • International Conference on Energy Systems Modelling & Hybrid Energy System Models 	<ul style="list-style-type: none"> • 2026: 2 • 2027: 1
ALMA	Cruise Norway Internasjonal Cruisekonferanse	8 presentations (2/year)
TUD	<ul style="list-style-type: none"> • European Fuel Cell Forum (EFCF) • Electrochemical Society (ECS) meetings • International Ship Control Systems Symposium (iSCSS), • MOSES 2025 	4 presentations <ul style="list-style-type: none"> • 2023: 1 • 2024: 1 • 2025: 1 • 2026: 1
IHC	<ul style="list-style-type: none"> • WODCON • CEDA • OTC • MOSES 2025 	2 presentations <ul style="list-style-type: none"> • 2025: 1 • 2027: 1
MSC		4 presentations

4.3 Technical Workshops and Webinars

Technical workshops will form another key pillar of the HELENUS dissemination strategy. While conferences enable the presentation of individual novel scientific methods and results, workshops will aim to present the project novelty in the context of a bigger picture, by bringing together various relevant themes and possibly other projects under a single umbrella. Workshops can be organized with specific themes, to ensure the dissemination and communication of results on a broad topic without being constrained to a single project. In this spirit, HELENUS will strive to host or co-host joint workshops with other EU-funded projects within EU, including the various associated projects that HELENUS partners are involved in, to also introduce new perspectives into the discussion and dissemination. The participation of networking and innovation platforms such as Waterborne EU will also be sought, to enable impactful dissemination. The exact details of these collaborative hosting opportunities have not yet been discussed, and will be done in 2023.

It is expected that **four** workshops will be organized by HELENUS over the life of the project – two in person, and two in the form of webinars. Some examples of the themes of workshops are shown in Table 8. Workshops may also be offered as webinars and/or seminars as applicable. Regular webinars will be organized by ALMA on an annual or half-yearly basis to showcase their SOFC product to potential customers.

Table 8: Workshop themes and possible participants

Theme of workshop	HELENUS focus	Potential other projects and contributions
HELENUS workshop	Presentation of technical novelties & developments within HELENUS	--
SOFCs in maritime applications	SOFC development and integration in ship machine area, lab results from various maritime duty cycles	<ul style="list-style-type: none"> • NAUTILUS • ShipFC • CAP

Fuel cells in cruise ships	SOFC development and integration in cruise ship machine area, electrical and thermal integration, and lab results from scaled-up scenario duty cycle testing	<ul style="list-style-type: none"> • NAUTILUS • Pa-X-ell 2 / e4Ships • Waterborne EU
Alternative fuels for shipping	Fuel-flexibility of SOFC with renewable fuels	<ul style="list-style-type: none"> • ENGIMMONIA
Energy-efficient technologies for cruise ships	Cogeneration and combined cycle-based heat recovery from SOFCs to achieve ultra-high efficiencies	<ul style="list-style-type: none"> • HEMOS
Modelling and control systems	SOFC transient control and energy management algorithms	Various projects from several thematic areas

4.4 Exhibitions & trade fairs

The HELENUS project will also be showcased at various industrial expos, exhibitions, and trade fairs within Europe, as elaborated in Table 9. Several consortium members will be present at SMM Hamburg in 2024 and 2026, and participations in other maritime trade fairs are also expected. HELENUS will aim to participate in 4 distinct trade fairs, with 11 overall instances of participation.

Table 9: Plan for participation in exhibitions and trade fairs

Partner	Name of exhibition/trade fair	KPI
DLR	<ul style="list-style-type: none"> • SMM Hamburg, 2024 & 2026 • Electric and Hybrid Marine Expo 	3 participations
ALMA	<ul style="list-style-type: none"> • SMM Hamburg, 2024 & 2026 • Norshipping • Posidonia 	3 participations
BAL	<ul style="list-style-type: none"> • SMM Hamburg 2024 	1 booth/stall display for project results
MSC	<ul style="list-style-type: none"> • SMM Hamburg, 2024 & 2026 • Posidonia 	3 participations

4.5 Guest lectures at universities and schools

The novel concepts and key technical results developed and demonstrated within HELENUS will be disseminated to the academic and research communities by delivering guest lectures at technical universities. A total of 9 guest lectures are planned in the universities associated with various HELENUS partners over the course of the project.

Table 10: Plan for guest lectures

Partner	University & Theme	KPI
DLR	Novel Maritime Energy Converters, Controls & Optimization, at TU Hamburg and TU Delft	3 lectures

TUD	Guest lectures within TUD in courses on ship energy and control systems	4 lectures
MSC	University of Genoa University of Naples and Trieste	2 lectures

4.6 Participation in technical podcasts/ radio talks

DLR, as the project coordinator, will aim to participate in one technical podcast or radio talk during the project to discuss the potential of SOFCs and fuel flexibility in decarbonizing shipping, and the contribution of the HELENUS project to the maritime industry. Some avenues of interest include:

- enPower – the energy transition podcast in German
- Redefining Energy
- Technik und Meer – Society of Maritime Technologies in German

4.7 Monitoring and KPIs for dissemination activities

The KPIs for each project dissemination avenue described in this Chapter are summarized in Table 11.

Table 11: KPIs and success metrics for dissemination activities

Communication Channel	Success metrics
Scientific publications	• 6 publications
Conference presentations	• 25 presentations
Technical Workshops and Webinars	• 2 technical workshops • 2 webinars
Exhibitions & trade fairs	• 4 trade fairs
Guest lectures at universities and schools	• 9 guest lectures
Participation in technical podcasts/ radio talks	• 1 talk

5. Exploitation Plan

“Exploitation” enables making a concrete use of results generated by the project for commercial, societal, and political purposes. It involves the development, creation, marketing, and provision of a product, process, service, or standardization activities, as well as the utilization of results in further research activities other than those covered by the action concerned.

5.1 Exploitation Avenues

The results from the HELENUS project will be exploited by the partners in the following ways:

- **Direct adoption by end-user(s) within HELENUS** – The results generated within the project will be directly adopted by customers and end-users participating in the consortium. As elaborated below in Table 12, this includes future implementation and scale-up of SOFCs in CdA/MSK and IHC ships, adoption of DLR- and TUD- developed SOFC control strategies and algorithms by Alma and WÄR, BV- developed regulations for installation and classification of SOFCs in the machine areas of ships, and the use of BAL- and ifeu- developed LCPA tools by the HELENUS partners.
- **Patents / IP and Licensing** – Patents will be filed to protect any intellectual property generated within HELENUS, with potential for future licensing. This includes the developments of methodologies, algorithms, control strategies, technological solutions, etc. All results will first be examined for the potential to protect, before being released for dissemination.
- **Contributing to standards/ guidelines/ regulations** – The HELENUS consortium will utilize the knowledge developed during the project around classification of SOFCs for maritime scenarios, installation and operational procedures onboard ships, safety procedures, operation with alternative fuels, to contribute to maritime standards, guidelines, and regulations around future installation and scale-up of SOFCs on board.
- **Policy Recommendations** – Future regulatory needs and policy recommendations to enable the increased adoption of SOFCs in shipping will be developed using the life cycle performance analysis (LCPA) tool, based on various simulation and experimental results generated during the project. These will be communicated to various stakeholders, trade groups, policymakers to ensure that the right policies are adopted to drive the decarbonization of waterborne transport.
- **Follow-up research and development activities** – the results are the generated within HELENUS will form the basis for future industry-funded R&D projects, involving one or more of the HELENUS consortium partners. Some foreseen projects resulting from HELENUS include carbon capture from LNG-based fuel cells, implementation of LNG fuel cells for offshore and land-based power supply, ship demonstrations of SOFC in cargo ships, dredgers, and offshore vessels, etc.
- **Research, teaching, and training** – The scientific tasks within HELENUS will support PhD and postdoctoral research efforts within DLR and TUD. The scientific methods and techniques developed within HELENUS will also generate new teaching material to impart industry-relevant cutting-edge knowledge to university students.

5.2 Exploitable Results and means of exploitation

The consortium has identified outcomes with high exploitation potential, target groups for exploitation, means to exploit the results, and means to disseminate and communicate the results and exploitation

activities, as detailed in Table 12. This will be used as the blueprint for all exploitation activities within the consortium, and periodically updated.

Table 12: Results and pathways for exploitation

Results that can be exploited	Potential users	Means to exploit the results	Dissemination and communication methods
500 kW SOFC demonstrator for installation in newbuild ships	<ul style="list-style-type: none"> • Shipyards and operators in various maritime applications • Other fuel cell manufacturers 	<ul style="list-style-type: none"> • Continued testing to reach TRL 8, followed by system scale-up and commercialisation. • Multi-MW commercial products can be offered by participants ALMA and WÄR, on first ship series applications on Royal IHC and CdA ships, especially with MSC cruises 	<ul style="list-style-type: none"> • Two shipyards, CdA and IHC are consortium members • Conducting visits to the cruise ship to display the demonstrator fuel cell
Solution for onboard integration on a cruise ship at TRL 7	<ul style="list-style-type: none"> • Shipyards, to offer SOFC solutions in future products • Ship operators, to use SOFC technology in their operations 	<ul style="list-style-type: none"> • Using this technology in new ship design, as well as possible retrofitting by replacing existing ICE-gensets • Application to other ship applications – cargo ships, offshore power, land-based power • Future R&D projects on carbon capture with LNG fuel cell module 	<ul style="list-style-type: none"> • Credibility of MSC, one of the largest cruise companies in the world, using this technology • Conducting visits to the cruise ship to display the demonstrator fuel cell • Trade-fairs, exhibitions, conferences • Video, press-release, and social media
Strategies/control algorithms demonstrating (a) fuel flexibility; (b) optimal transient operation; and (c) scalability; of SOFCs in maritime applications	<ul style="list-style-type: none"> • Fuel cell companies • Renewable fuel suppliers • Research centres and universities 	<ul style="list-style-type: none"> • Technology adoption by SOFC suppliers and integrators, starting with consortium participants ALMA and WÄR • Enabling future research programs to develop and optimise the technologies • IP/Patent Applications • PhD and postdoctoral research efforts • Teaching material for coursework and research problems for graduate projects 	<ul style="list-style-type: none"> • Conferences, scientific publications • Laboratory visits by SOFC suppliers and renewable fuel suppliers to promote the technology • Videos/press-releases of successful laboratory demonstration

Experimental results of SOFC operation over maritime duty cycles (laboratory as well as field results)	<ul style="list-style-type: none"> • SOFC suppliers • Shipyards • Ship operators • Research universities 	<ul style="list-style-type: none"> • Validation of proprietary models with experimental data • Improvement of inventory for lifecycle analysis • Informing future R&D efforts and research directions • PhD and postdoctoral research efforts 	<ul style="list-style-type: none"> • Sharing raw data amongst the consortium, and normalised data with appropriate anonymity publicly
Classification methodologies for SOFC systems in ships	<ul style="list-style-type: none"> • Classification societies 	<ul style="list-style-type: none"> • Development of Regulations, Codes & Standards • Creation and regular updates of new class rules and safety guidelines for ships with fuel cell installations 	<ul style="list-style-type: none"> • Reports and publications • Dissemination to policymakers through networks, societies, and associations
Lifecycle Analysis (LCA) and Lifecycle Performance Analysis (LCPA)	<ul style="list-style-type: none"> • Research centres • Consulting companies 	<ul style="list-style-type: none"> • Use results of LCA to enrich the LCPA tool • Provide LCPA service to a wider clientele of customer groups based on HELENUS results 	<ul style="list-style-type: none"> • Company marketing • National and international networks, societies, and associations
Results from LCPA and scale-up and roadmap analyses	<ul style="list-style-type: none"> • Regulators and policymakers • Classification societies • Environmental sector 	<ul style="list-style-type: none"> • Publications and open repositories • Generate recommendations for new regulations 	<ul style="list-style-type: none"> • Reports to regulatory bodies • Publicly available data • Multi-stakeholder presentations • Conferences and scientific publications

5.3 Monitoring and KPIs for exploitation activities

The consortium will continuously monitor and track the results generated during the project using the results ownership list, identify key exploitable results, and check for their potential for exploitation. Accordingly, the avenues and opportunities for exploitation, as well as the KPIs for the same will be modified. The KPIs for each exploitation avenue described above, as identified by the HELENUS consortium at this point of time, are summarized in Table 13.

Table 13: KPIs for exploitation methods

Exploitation Avenue	KPI targets
Direct adoption by end-users in HELENUS	<ul style="list-style-type: none"> • 5 instances of key technology transfer between HELENUS partners • Scale up to 10 MW SOFCs by 2030
Patents/IP	<ul style="list-style-type: none"> • 5 patent applications
Contribution to standards, guidelines, and regulations	<ul style="list-style-type: none"> • 2 publications by the end of the project
Policy recommendations	<ul style="list-style-type: none"> • 2 publications by the end of the project
Follow-up R&D activities	<ul style="list-style-type: none"> • 5 R&D projects involving HELENUS partners by 2030 • 5 R&D projects by other companies based on HELENUS DE&C
Research, teaching & training	<ul style="list-style-type: none"> • 4 PhD degrees • 6 postdoctoral research theses

6. Implementation of the DE&C Plan

6.1 Roles and responsibilities

All dissemination, exploitation, and communication activities of the HELENUS consortium will be carried out under WP9, which is led by DLR. All HELENUS partners will contribute to the execution of the various DE&C activities described above using their own networks and communication channels. As the leader of WP9, DLR will coordinate and track the activities, by requesting periodic DE&C reports from the partners, and compiling a joint list. The online Teamsites tool will be used to plan, organize, and track all DE&C activities carried out within HELENUS. DLR will periodically compare the executed activities against the DE&C plan, and update the plan in case of deviations. The completed DE&C activities will be discussed in every consortium meeting, and plans for any upcoming activities will be made.

6.2 DE&C Procedure

The HELENUS consortium recognizes the general obligations to protect, disseminate, and exploit results generated through the project. Any novel results with potential for protection and later exploitation will first be done so, before being disseminated and communicated. All DE&C activities carried out within HELENUS need approval from the consortium. The procedures for the dissemination and communication of results is detailed below, and also illustrated in Figure 9.

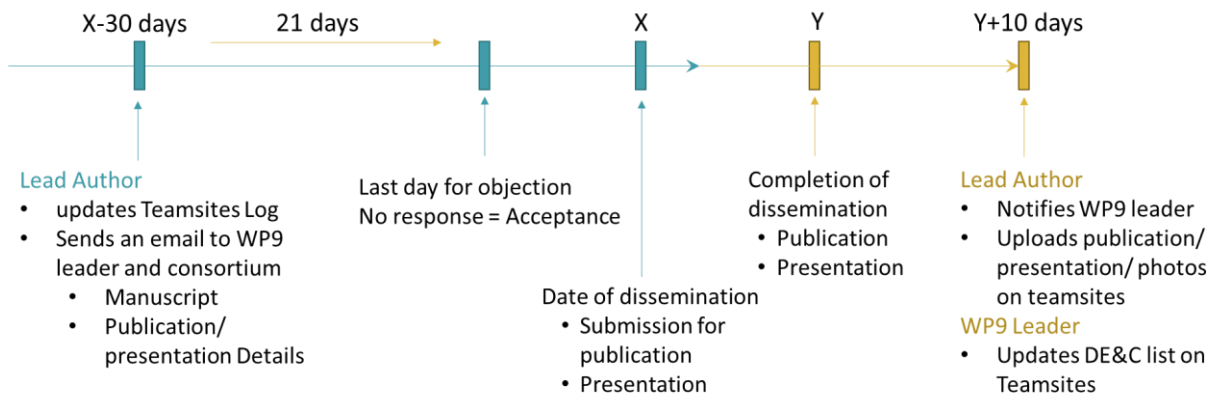


Figure 9: Procedure for carrying out DE&C activities

6.2.1 Procedures leading up to dissemination:

- At least 30 calendar days before the date of dissemination, the lead author
 - updates the Teamsites log with the planned dissemination material (manuscript of publication, presentation, etc.), and marks the dissemination status as “in progress”.
 - places the dissemination material on Teamsites, by creating a new folder specific to each dissemination event in the WP9 folder: <https://teamsites-extranet.dlr.de/sites/helenus/Documents/Forms/AllItems.aspx?id=%2Fsites%2Fhelenus%2FDocuments%2FWork%5FPackages%2FWP9%2FDissemination>
 - notifies the WP9 leader as well as the consortium via email about their intent to disseminate and shares the Teamsites link to the dissemination material.
 - The date of dissemination is defined by the date a manuscript is submitted for publication, or the day of presentation (i.e., date of transfer of material to an external party with an intent to disseminate)

2. The consortium has a maximum of 21 calendar days following the date of notification to object to the dissemination, by emailing the WP9 leader.
 - In case of objection, the concerned consortium member should include a detailed justification of the same, including a list of requested modifications. No response is considered as acceptance.
3. The WP9 leader conveys the final decision to the lead author
 - In case of approval, the lead author makes any requested modifications before starting the dissemination process.
 - In case of objection, clear next steps will be determined jointly by the lead author, WP9 leader, and the concerned consortium member within the week following the objection.

6.2.2 Procedures after the completion of dissemination:

4. The lead author places the disseminated material in an open-access repository within two days of the completion of the dissemination process, by following the various FAIR guidelines detailed in the Data Management Plan (D1.2). This includes the manuscript/presentation and all associated datasets.
5. Within 10 days of completion of the dissemination process, the lead author
 - notifies the WP9 leader via email
 - updates the Teamsites Log with the latest documents marking the dissemination process as “complete” including details about the open-access repository from step 4.
 - uploads the final paper or presentation in same dissemination folder created in Step 1.
 - uploads any photos from the activity, if available
6. The WP9 leader adds the completed dissemination activity in the list of completed DE&C activities, for inclusion in the next periodic report.

Partners are welcome to present or release any already-approved dissemination material without requiring consortium approval again. However, the WP9 leader must be informed, so that the dissemination activity may be reflected in the list of completed DE&C activities.

6.2.3 Non-European travel for dissemination

Travels outside the EU do not receive a-priori approval, and need to be communicated with the Project Officer in advance for approval. A link and interest of the non-EU travel to the HELENUS project must be justified in the periodic report. Any partner who wishes to travel outside the EU must inform the Project Coordinator at least two months in advance. It is recommended to retain the original request as well as EC’s response with the respective travel documents for possible future audits.

6.2.4 Acknowledgement of EU funding

The funding received from the European Union must be acknowledged in all dissemination material using the following text:

This [work] [infrastructure] [equipment] [insert type of result] is a part of the HELENUS project, which has received funding from the European Union’s Horizon Europe research and innovation programme under grant agreement No. 101056784.

6.3 Management of Intellectual Property

The HELENUS consortium recognizes the general obligation to protect results, and will take necessary steps to identify and protect intellectual property (IP). The IP generated within HELENUS is owned by the partner(s) who have developed the IP. Section 9 of the consortium agreement signed by the HELENUS partners outlines the various procedures related to access rights. The partners identified and agreed on the Background for the Project and have also, where relevant, informed each other that Access to specific Background is subject to legal restrictions or limits. The background of various partners listed in the Consortium Agreement is summarized in Table 14.

Table 14: Background for the implementation of HELENUS tasks, as described in the Consortium Agreement

Partner	Background for the implementation of HELENUS
ALMA	<ul style="list-style-type: none"> • Software models and simulation tools • SOFC module design • Fuel cell systems design and manufacturing • SOFC test protocols and test data • Fuel Cell Management and Operation Software • Fuel cell condition monitoring and analysis • Intellectual property rights (IPR) • Fuel cell safety system
BAL	<ul style="list-style-type: none"> • BAL.LCPA software tool
MSC	<ul style="list-style-type: none"> • Ship's drawings and Technical Specifications • Ship's documentation • Management and Operation Company procedures • Ship Technical operational data
WÄR	<ul style="list-style-type: none"> • Energy Storage • LNG storage and supply safety systems • Software models and simulation tools • Energy Management Systems
BV	<ul style="list-style-type: none"> • Bureau Veritas Rules for Classification, Guidance Notes and associated knowledge: <ul style="list-style-type: none"> ○ NR467: Rules for the classification of steel ships and associated Rule Notes ○ NR547: Ships using fuel cells ○ NR529: Gas-fuelled ships ○ NR670: Methyl/ethyl alcohol fuelled ships

7. Conclusion

HELENUS will significantly contribute to the decarbonization of the shipping industry by demonstrating the potential of high efficiency solid oxide fuel cells operating in cogeneration mode. This deliverable outlines the various activities surrounding the dissemination, exploitation, and communication of the project to various audiences and target groups, to ensure that the outcomes and impacts of the project are sufficiently transferred to the society.

A wide range of communication, dissemination, and exploitation activities is planned by the consortium with aggressive targets. These include, but are not limited to newsletters, videos, press releases, social media campaigns, reports, workshops and events. All dissemination and communication activities will be monitored and evaluated across well-defined KPIs to ensure maximum impact of project results.

The DE&C activities will be implemented on an individual partner level, as well as the consortium level. All activities related to HELENUS will be tracked by the WP9 leader to ensure complementarity and completeness of the dissemination, while avoiding unnecessary duplication and respecting the IP requirements of all partners.

Finally, the DE&C plan will be considered to be a living document, and will be continuously monitored and updated by the consortium as the project evolves. The plan will abide by the obligations of the consortium to protect, disseminate, and exploit results, and will ensure impactful transfer of the project results through tailored and well-targeted activities.



High Efficiency Low Emission Nautical SOFC