

DARE2X



Decentralised Ammonia production from Renewable Energy utilising novel sorption-enhanced plasma-catalytic Power-to-X technology

D7.2 – DISSEMINATION AND COMMUNICATION PLAN - VERSION 2

Lead beneficiary: LOMARTOV

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Executive summary: This document describes the activities implemented in the framework of the Dissemination & Communication Plan of the DARE2X project, between Month 7 and Month 18. It outlines the strategy designed, the methodology followed, the tools and channels used and how they are tailored to the targeted audiences. It also describes the clustering and networking activities with similar EU-funded projects and initiatives and how all this is carefully monitored and updated to meet the needs of the project. Connections with the Data Management Plan and Intellectual Property Rules are also explained. This document corresponds to the second version of the D&C Plan, which will be constantly updated until a last version is delivered in Month 36.

PROJECT DATA			
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Deliverable title	7.2 – Dissemination and Communication Plan - Version 2		
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WP No.	WP7 - Dissemination, Communication and Exploitation		
Related task	Task 7.1 Dissemination and Communication towards impact. Task 7.5 Clustering and networking activities.		
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¹ R: Document, report; DEM: Demonstrator, pilot, prototype; DEC: Website, video etc., DATA: Data sets; DMP: Data management plan; ETHICS; SECURITY; Other: Software, technical diagram, algorithms, models etc.

² PU: Public, fully open; SEN: Sensitive.

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ABBREVIATIONS AND ACRONYMS

AEA	Ammonia Energy Association	KPI	Key Performance Indicator(s)
CRM	Critical Raw Materials	LOM	LOMARTOV
D&C	Dissemination and Communication	M	Month
DMP	Data Management Plan	MS	Milestone(s)
DTI	Danish Technological Institute	NH₃	Ammonia
EC	European Commission	NIC	Kemijski inštitut - National Institute of Chemistry
EERA	European Energy Research Alliance	PtX	Power-To-X
EU	European Union	R&D	Research and Development
FAIR	Findability, Accessibility, Interoperability and Reusability principles	R&I	Research and Innovation
GA	Grant Agreement	SET	Strategic Energy Technology Plan
H₂	Hydrogen	TRL	Technology Readiness Level(s)
HB	Hulteberg Chemistry & Engineering	UKRI	United Kingdom research and Innovation
IPR	Intellectual Property Rights	UoL	University of Liverpool
ISO	International Organization for Standardization	WP	Work Package
KER	Key Exploitable Results		

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1. Introduction

DARE2X – Decentralised Ammonia production from Renewable Energy utilising novel sorption-enhanced plasma-catalytic Power-to-X technology – GA No. 101083905 – is a European (EU) Project Funded under the Horizon Europe programme, within the topic *HORIZON-CL5-2021-D3-03-02 – Next generation of renewable energy technologies*.

The project, coordinated by the Danish Technological Institute (DTI), gathers expert European partners focused on research and innovation (R&I) to disrupt the ammonia (NH₃) production landscape by enabling a sorption-enhanced plasma-catalytic NH₃ synthesis. Ammonia is the second most produced primary chemical in the world and its centralised production is called the Haber-Bosch process, which is based on the transformation of natural gas (fossil fuel) at high pressure and temperature. Replacing the Haber-Bosch process with a sustainable alternative for the production of NH₃ will contribute to decarbonising the European industry, helping the European Union's goal of a competitive economy with net-zero greenhouse gas emissions by 2050 (European Commission, 2018).

LOMARTOV (LOM) is the member of the consortium in charge of designing and implementing the dissemination and communication (D&C) strategy that will allow the project to gain visibility among a wide variety of audiences and to contribute knowledge for the scientific community investigating on the same topic through the divulgation of the project's outcomes.

In the process of developing the D&C strategy, the main expectations, messages, communications tools and means have already been identified, and compiled in a guideline for the consortium members, to implement the D&C activities. It was reported upon extensively in D7.1 Dissemination and Communication Plan – Version 1, delivered in month 6.

The present document, *D7.2 Dissemination and Communication Plan – Version 2*, is an updated version of the first Dissemination and Communication Plan D7.1. It describes the activities carried out from month 6 until month 18 of the project implementation and how these are monitored and evaluated so as to adapt them to the needs of the project and plan for the next steps.

1.1 Scope of D7.2

This deliverable is an outcome of work package (WP) 7, dedicated to designing, implementing and monitoring the dissemination, communication, and exploitation activities of the DARE2X project, whose objectives are to:

- Define a targeted, effective, and high-impact **communication, dissemination, and outreach strategy**, to connect the project with all internal and external possible beneficiaries and interested parties.
- **Analyse the market opportunities of the Key Exploitable Results (KER)** and design an exploitation strategy that will enable the project to reach a higher Technology Readiness Level (TRL).
- Pave the way towards the future market uptake of DARE2X outcomes and technology concept by **defining all the potential applicable business cases**.
- **Identify the applicable standards and regulations for the project** to enhance its market uptake.



- **Establish proper D&C channels with relevant projects and networks working in the same field**, in order to capitalise on mutual achievements, foster further developments and receive feedback from key actors at EU level.

To achieve these objectives, five tasks will be carried out in WP7:

- 7.1 Dissemination and Communication towards impact.
- 7.2 Market Analysis & Watch Activities for DARE2X exploitation strategy.
- 7.3 DARE2X business cases.
- 7.4 Standardisation and certification roadmap.
- 7.5 Clustering and networking activities.

The DARE2X D&C Plan and its public deliverables cover specifically tasks 7.1 and 7.5. The Exploitation plan covers tasks 7.2, 7.3 and 7.5, while task 7.4 will produce its own public deliverable.

Task 7.1 is dedicated to designing and implementing all the activities that build an effective D&C Plan and dissemination strategy for the DARE2X project results, aimed at engaging with and creating awareness among the targeted stakeholder groups.

Task 7.5 focuses on building relationships with key stakeholders across the NH₃ value chain from production to storage, to the various sectors of application such as renewable energy, shipping, green fuel, and agriculture. This also includes the scientific and research communities and policymakers. The aim is to enhance the creation of a “hub” for NH₃ decarbonisation. Said hub involves also networking activities with current EU-funded projects, initiatives, and platforms working on the same issue, through planning joint D&C activities to share knowledge and spread good practice in order to ensure a wider impact.

1.2 Structure of D7.2

This deliverable is organised in the following chapters:

- An outline of the general considerations, methodology and overview of DARE2X D&C Strategy and its implementation (Chapter 2).
- Selected channels and means implemented for carrying out the **communication activities** (Chapter 3). This includes the latest updates of the visual identity and branding, website, social media, dissemination materials, press releases, articles, newsletters and events.
- Selected channels and means implemented for carrying out the **dissemination activities** (Chapter 4).
- Outcomes of the clustering and networking activities (Chapter 5).
- Latest updates of the indicators, targets, and metrics of communication (Chapter 6).
- Implications of the Data Management Plan (DMP) and the Intellectual Property Rights (IPR) and how these aspects are linked to the D&C activities and their results (Chapter 7).
- Bibliographical references supporting the information provided throughout the present document (Chapter 8).
- ANNEX I: D&C QUESTIONNAIRE FOR PARTNERS is a set of screenshots of the most updated communication activities reported by the project partners
- ANNEX II: DETAILED STAKEHOLDER ANALYSIS MATRIX BY OBJECTIVE AND GEOGRAPHIC LEVEL is a document shared with the project partners to complete it individually.

2. Dissemination and Communication Strategy

2.1 General considerations and methodology

D&C initiatives are an essential activity under any R&I projects and are an obligation established by the European Commission (EC) for all beneficiaries of Horizon Europe Fundings, as mentioned in the Article 17 of the Grant Agreement (GA). The present plan endorses the continuous terms of “dissemination” and “communication” as they have been defined by the European Commission (European Commission, 2021):

- **Communication** means *“taking strategic and targeted measures for promoting the action itself and its results to a multitude of audiences, including the media and the public, and possibly engaging in a two-way exchange. The aim is to reach out to society as a whole and to some specific audiences while demonstrating how EU funding contributes to tackling societal challenges”*.
- **Dissemination** refers to *“the public disclosure of the results by any appropriate means, including by scientific publications in any medium”*. Besides, dissemination *“makes research results known to various stakeholder groups (like research peers, industry and other commercial actors, professional organizations, policymakers) in a targeted way, to enable them to use the results in their own work”*.

DARE2X D&C Plan is structured according to these definitions and clearly distinguishes the approaches, tools and channels used for Communication (Chapter 3) from those used for the Dissemination (Chapter 4), although they overlap at times.

In terms of methodological steps, the D&C strategy is designed and implemented around the 4 key phases of the project: the **research phase**, the **concept validation phase**, the **scale-up phase** and a transversal **multi-level mobilisation phase** that extends from month 1 until the end of the project.

During the multi-level mobilisation phase and the research phase, the D&C activities focused on developing the key messages and promoting general awareness about the project, working mainly on designing the visual identity of the project and identifying the main target groups, while using a universal language to communicate to these target audiences.

From M18 onwards, it is when the DARE2X D&C Plan starts the concept validation phase, based on the mobilisation and attraction of potential users, customers, and other supporters for commercialisation purposes. This mobilisation is completed with an identification of and engagement with the key target audiences using a stakeholder analysis approach to be carried out by each individual member of the consortium.

The last phase consists in the scale-up strategy during which tangible results are achieved, putting special attention to the market and financial schemes for the DARE2X technology, and seeking to mobilise policy-makers, regulators and civil society organisations to endorse the



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necessary measures and infrastructure for the successful deployment of the decentralised NH₃ production technology i.e. removing and/or mitigating barriers that are external to the project itself.

Table 1 details DARE2X project phases and their corresponding D&C purposes, target audiences, actions and key performance indicators (KPIs) for monitoring the progress of these actions.



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Table 1: Overview of DARE2X D&C strategy and actions for each project phase

PROJECT PHASE		II. RESEARCH	III. CONCEPT VALIDATION AND INDUSTRIAL DISSEMINATION	IV. SCALE-UP STRATEGY IN THE EU CONTEXT	
		<i>Share knowledge and research outputs</i>	<i>Attract potential users and customers for commercialisation purposes</i>	<i>Inform the potential supporters</i>	
		M1 – M18	M18 -M36	M18 -M36	
I. MULTI-LEVEL MOBILISATION M1 – M36 <i>Increase project general awareness</i>	M1 – M36	PURPOSE			
		<ul style="list-style-type: none"> Increase awareness among a wider community of the impact of EU research on carbon-free fuels and their potential for green energy transition, Inform and improve the public image of the use of NH₃ solutions, enabling contact with the project. 	Disseminate research outcomes of the project to: <ul style="list-style-type: none"> Increase the scientific knowledge Exchange of ideas and network Promote synergies between DARE2X and other existing R&I projects Facilitate the uptake of project results for other R&I purposes. Attract younger generations to the project objectives Inform about job opportunities and create new research pathways for future PhD students 	Quantitative and qualitative results to show to the main industrial stakeholders and potential users of the technology: to establish preliminary commercial and licensing agreements, to facilitate the attraction of further investments and financing for the scale-up	To endorse the necessary measures and infrastructure for the successful deployment of the decentralised NH ₃ production technology i.e. to remove and/or mitigate barriers that are external to the project itself <div style="text-align: center;">↓</div> Support development of guidelines for future policies and regulations related to NH ₃ production and transport, habilitating the use of NH ₃ as a green fuel
		TARGET AUDIENCE			
		<ul style="list-style-type: none"> Experts in the field General public Social stakeholders General media 	<ul style="list-style-type: none"> European research groups in the fields of: CRM-free catalysts & sorption materials, carbon-free fuels, energy storage; transport Graduate students & Early-stage researchers (young students and researchers to continue investigating and improving the DARE2X concept) Specialised media/Journals European partnerships and strategies related to renewable energy sources, NH₃ 	NH ₃ producers and End-users: <ul style="list-style-type: none"> Energy-intensive industries (steel, chemicals, cement, etc. Transport (including shipping) Renewable energy sector/Energy storage: wind turbine producers and wind energy producers Engineering companies producing NH₃ plants Agriculture 	<ul style="list-style-type: none"> Policy makers and standardisation bodies Social actors (civil society, environmental agencies etc.)



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		production and storage: SET plan (Strategic Energy Technology Plan), European Energy Research Alliance (EERA), Standardisation committees within ISO, Ammonia Energy Association (AEA), among other networks that might raise during the project development.		
D&C ACTIVITIES				
Transversal to all D&C activities:				
1) identify all direct and indirect stakeholders with the contribution of the partners 2) Tailor Dissemination channels & tools to each stakeholder group 3) Establish a timeline of D&C activities				
	<ol style="list-style-type: none"> 1. Universal language 2. Project website 3. Press releases 4. Social media 5. Project dissemination material 6. Interviews of project partners in local TV and Radio 7. Publications in science magazines, and newspapers 8. DARE2X video presentation in universal language the project activities and findings 9. Invitation to attend project meetings and events 	<u>European Research Groups:</u> <ol style="list-style-type: none"> 1. Project and partners websites 2. Articles in relevant networks webpages 3. Newsletter 4. Social Media 5. Invitation to conferences, seminars, workshops organised by the project. 6. Scientific publications 7. Scientific events and presentations/meetings at key conferences 8. Organisation of 2 webinars 9. Invitation to other project events (e.g., final conference) <u>Graduate students and Early-stage researchers:</u> <ol style="list-style-type: none"> 1. Social media 2. Scientific publications 3. Direct information from academic partnership 4. Invitation to events (i.e. European Researcher's night & webinars) 	<ol style="list-style-type: none"> 1. Target group in 2 workshops 2. Conferences and seminars organised by the project: show the plant demonstrator and guide visit to the plant 3. Participation in industrial fairs: Presentations/face-to-face meetings at industrial fairs 	<ol style="list-style-type: none"> 1. Specific industrial workshop: Invitation of industrial target group to the industrial workshop. 2. Distribution of project newsletter, leaflets, and posters. 3. Conferences and seminars organised by the project (e.g. show the plant demonstrators) 4. Guided visit to the plant demonstrators. 5. Invitation to project's events. 6. Distribution of communication printed material. 7. Social media campaigns.



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	<p>10. Visit a local secondary schools to present/give a lecture on the related topics.</p>	<p><u>Specialised media/Journals:</u></p> <ol style="list-style-type: none"> 1. press releases with technical and economic information 2. Interviews of project partners 3. Invitation to attend project's events and industrial workshop 		
KPIs				
<p>Transversal to all D&C activities: 4) Establish Qualitative and Quantitative Performance Indicators for the distribution channels</p>				
	<p><u>General media:</u></p> <ol style="list-style-type: none"> 1. 1 press release per year per partner 2. 1 project video shared through online general media. <p><u>General public:</u></p> <ol style="list-style-type: none"> 3. At least 30,000 people reached throughout all activities. 	<p><u>European Research Groups:</u></p> <ol style="list-style-type: none"> 1. Participation in at least 12 International scientific-technical events 2. Reach at least 40 participants to the webinars and other events. <p><u>Specialised media/Journals:</u></p> <ol style="list-style-type: none"> 3. At least 10 publications/articles in specialised media reaching more than 500 readers 	<ol style="list-style-type: none"> 1. At least 50 companies reached directly as engaged stakeholders during the project. 2. Participation in at least 10 European industry-relevant events 	<ol style="list-style-type: none"> 1. Participation of policy representatives in events organised by the Consortium. 2. At least one social stakeholder reached per partner, with an impact communication capacity of more than 200 people.

2.2 Implementation of the D&C Strategy

In practice, DARE2X D&C Strategy is implemented according to the purposes and activities identified for each project phase (Table 1). While phase 1 of Multi-level mobilisation is being implemented continuously throughout the life of the project and from the start, the implementation of the research phase and the subsequent phases are done by means of an updated D&C Questionnaire and requires at this stage of the project, carrying out an in-depth Stakeholder analysis.

While the first is meant to track and monitor the D&C activities carried out at each stage by each partner, the latter will inform about the specific audiences that the D&C needs to target and engage with in the coming phases.

2.2.1 D&C Questionnaire

An internal D&C questionnaire was created at the beginning of the project for the partners to report regularly on their D&C activities. The questionnaire is a tracking and monitoring tool and is also constantly updated to the needs of the project. During the period covered by this deliverable, a new version of the D&C questionnaire was used to collect information about:

1. **Publications** released and those foreseen until the end of the project.
2. Participation in and/or organisation of **events**, seminars, conferences, and workshops.
3. **Current EU-funded Projects** that have synergies with DARE2X for the clustering and networking activities (Task 8.5).
4. **Industrial companies** that could be crucial for the future scale-up and exploitation of DARE2X. They could also become a member of the Advisory Board.
5. **Industry associations** that could be crucial for the future scale-up and exploitation of DARE2X. They could also become a member of the Advisory Board.
6. **Policy-makers** and **social stakeholders** that may have an impact on the project. They could also become a member of the Advisory Board.

The project partners are requested to update the information they provide in the D&C questionnaire at least every 6 months but they also do so on a continuous basis. The latest updates are detailed in ANNEX I: D&C QUESTIONNAIRE FOR PARTNERS at the end of this deliverable and throughout the next chapters.

2.2.2 Stakeholder analysis

The objective of undertaking a stakeholders analysis is twofold: firstly, to identify and define all the **direct** and **indirect stakeholders** and **target audiences** who have an interest in or may be impacted by the project, and secondly, to tailor dissemination, communication, Social Acceptance, and the exploitation strategies to these stakeholders. This will ensure that the project's objectives align with stakeholders interests and concerns, maximising engagement, and support.



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Table 2 shows the preliminary stakeholder groups as identified in the project proposal. They encompass a diverse range of actors, including policy makers, experts in the field, industrial partners, and the general public. Each stakeholder group brings its own interests, priorities, and potential impact on the project. By conducting a thorough analysis of these stakeholders, DARE2X can better understand their perspectives, needs and expectations, enabling targeted communication and engagement.

Moreover, the stakeholder analysis directly contributes to achieving KPIs outlined in the project plan. It informs the planning and execution of essential project activities such as industrial workshops, webinars, networking events, and outreach efforts. By involving stakeholders at various levels, DARE2X aims to foster collaboration, build support, and ensure the successful dissemination and uptake of its innovative solutions for green ammonia production.

A stakeholder analysis matrix (Table 3) was prepared by LOMARTOV and introduced to the partners explaining how to use it. The matrix is structured around the four main objectives of the D&C and across the local, national, EU and international levels (ANNEX II: DETAILED STAKEHOLDER ANALYSIS MATRIX BY OBJECTIVE AND GEOGRAPHIC LEVEL). It will be circulated to the partners to complete it individually.

The information collected through this exercise will be crucial for the D&C activities of the next project phases i.e., concept validation and scale-up (Table 1). The results obtained will be presented in the next version of the D&C plan.



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Table 2: DARE2X Stakeholder groups identified in the project proposal

Project Phase	Objective	Stakeholder Group
1) Multi-level mobilisation (all time)	Increase general project awareness	Experts in the field General public General media Local TV; Local radio; Local newspapers Science magazines Secondary schools
2) Research	Share project knowledge and research outputs	European research groups in the fields of: CRM-free catalysts & sorption materials, carbon-free fuels, energy storage; transport Graduate students & Early-stage researchers (young students and researchers to continue investigating and improving the DARE2X concept) Specialised media/Journals: Scientific & Industrial Journals? European partnerships and strategies related to renewable energy sources, NH ₃ production and storage: SET plan (Strategic Energy Technology Plan), European Energy Research Alliance, Standardisation committees within ISO, Ammonia Energy Association (AEA) + other networks.
3) Concept validation and industrial dissemination	Attract potential users and customers for commercialisation purposes	NH ₃ producers & End-users ^[1] Energy-intensive industries (steel, chemicals, cement, etc.) Transportation & Marine transportation/shipping Renewable energy sector/Energy storage: wind turbine producers and wind energy producers Engineering companies producing NH ₃ plants Agriculture
4) Scale-up strategy in the EU context	Inform the potential supporters	Policy makers Standardisation bodies ^[2] Social actors (civil society, environmental agencies etc.)

[1] These stakeholders are currently analysed in TASK 7.2 Market Analysis & Watch Activities for DARE2X exploitation strategy (LOM M3-M32)

[2] Standardisation bodies are currently under analysis in Task 7.4 Standardisation and certification roadmap (LOM (M6-M34))



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Table 3: DARE2X Stakeholder analysis matrix

Stakeholder	Stakeholder interest in the project	Assessment of impact	Relative prioritisation	Potential Strategies for Obtaining Support or Reducing Obstacles
<p>List all the <u>stakeholders (internal and external)</u> that may affect or be affected by the DARE2X project <u>directly and indirectly</u></p>	<p>Consider:</p> <ul style="list-style-type: none"> • How does DARE2X technology concern them? • How are the issues addressed by DARE2X relevant to their priorities? • What is the DARE2X benefit (s) to them? • What aspects of DARE2X might cause conflict for them? 	<p>Consider:</p> <ul style="list-style-type: none"> • How important are the experts' interests to the success of DARE2X? • The role the experts in the field must play for DARE2X to be successful, and the likelihood that these experts will play this role. 	<p>Consider:</p> <ul style="list-style-type: none"> • How important is it to involve the stakeholder in DARE2X? 	<p>Think of how you might approach each of the experts, i.e.:</p> <ul style="list-style-type: none"> • What motivates them? • What kind of information will they need? • What are their expectations from you and DARE2X?



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3. Communication tools and channels

3.1 Visual Identity and templates

The **project logo and visual identity were created within the first three months of the project.** To harmonise all the communication materials and give a consistent visual identity to the project, a brand book was created. The brand book provides different versions of DARE2X logo in order to use it on different supports, both digitals and printed. The colour palette and the font to be used in text and D&C materials are as well provided.

Following the brand book, different templates for minutes, deliverables (.docx) and presentation (.pptx) were also created in the first three months of the project.

3.2 Website

DARE2X project website was designed and made publicly available at M3 (<https://dare2x.eu/>). It provides an accessible and user-friendly experience to engage and inform the target audiences and stakeholders about project goals, results, and developments in the research activities. The project website will be managed, maintained, and hosted for the duration of the project and beyond, at least 5 years after the completion of the project.

The website is divided in different tabs:

- **Project:** “the project in a nutshell” including information on the purpose, impact, and implementation. A new sub-tab was created during the reported period to include the *Related initiatives* with which DARE2X has ongoing clustering relations.
- **Consortium:** information and contact of the members of the consortium.
- **News and events:** repository of all the activities related to DARE2X.
- **Results:** all the project public reports, newsletters, press release and communication materials.
- **Contact:** details to contact with the project coordinator.

New content was updated and added during the period covered by this deliverable: A sub-section called **Related Initiatives**, under the **Project** section, the **News and events** and **Results** sections, where new activities of DARE2X were provided, i.e. press releases, articles, reports and newsletters.

The **Related Initiative** sub-section contains information about relevant projects that have synergies with DARE2X and that are part of Task 7.5 on clustering and networking activities. Figure 1 shows this new featured tab. More detailed information can be found on the project’s website.

RELATED INITIATIVES

PROJECTS



RECYCALYSE

New sustainable and recyclable catalytic materials for proton exchange membrane electrolyzers.

RECYCALYSE will disrupt the energy storage market through the development and manufacture of highly active sustainable oxygen evolution catalysts, and through a recycling scheme for membrane electrolyzers catalysts, electrodes, and overall system. This technology will help to reduce or eliminate the use of Critical Raw Materials (CRM), thus decreasing CO₂ emissions and reducing costs.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 847880



SOLARX

Dispatchable concentrated Solar-to-H energy solution for high penetration of renewable energy

SOLARX is a 3-year project funded by the European Commission's Horizon Europe research & innovation programme. It addresses the shortcomings of current energy infrastructures that are not designed to handle large shares of intermittent renewable energy sources. SOLARX integrates three high concentration solar technologies and AI-based smart resource management into a dispatchable Renewable Energy System (RES). To this end, SOLARX will develop 3 Key

Technological Elements: a smart solar resource management algorithm which aims to meet local instantaneous energy demands, a high efficiency Concentrating Photovoltaic (CPV) receiver and a carbon negative H₂-energy H₂ receiver. The main goal of the project is to demonstrate, at the laboratory scale, the technical, economic, and social value of the synergistic efficient production of heat, electricity and H₂ from solar resource in a single facility, considering energy demands and market prices for a wide range of locations and application scenarios.



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101084558



MOF2H2

Metal Organic Frameworks for Hydrogen production by photocatalytic overall water splitting

MOF2H2 main ambition is to reach a world-record efficiency for sun-driven clean hydrogen production of 5% solar-to-hydrogen efficiency, using metal-organic frameworks (MOFs) as photocatalysts (through photo-dissociation of water). To this end, the project will synthesise and optimise several generations of MOFs and related composites. Its final goal is to optimise and upscale the best materials and prototypes under sustainable and economically viable conditions.



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101082031



HiPowAR

Highly efficient Power production by green Ammonia total oxidation in a membrane Reactor

In HiPowAR, a new membrane reactor is being developed for efficient energy production from ammonia. The project focuses on a breakthrough in the direct conversion of ammonia into energy. This is driving the acceptance of ammonia as a synthetic fuel without CO₂ emissions. The membrane reactor developed is based on a MFC (Mixed Ionic-Electronic Conductors) membrane and achieves higher efficiencies in energy production than internal combustion engines and steam generators.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 847880

Figure 1: Related initiatives tab in DARE2X website



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3.3 Social media

The DARE2X project social media accounts **LinkedIn (#DARE2X)** and **Twitter (@DARE2X_EU)** were created during the first 3 months of the project implementation. These two platforms were considered the most used by the target audiences of the project.

Since the launch of the social media accounts, content has been shared regularly to communicate project updates, results, and other relevant advancements.

Some examples of the carried **social media campaigns** include “Meet the partners” “Reached a milestone”, “DARE2X news & updates”, “DARE2X events”, and “Subscribe to our newsletter”. Posts about General Assemblies constitute an example of the “DARE2X news & updates” campaign, as shown in Figure 2.



Figure 2: Sample post of the “DARE2X news & updates” campaign on LinkedIn

The project is also engaged in the “Clustering activities” social media campaign, covering the clustering and networking activities that DARE2X carried out with similar EU-funded projects. The campaign aims to disseminate general information about other projects and initiatives working on similar topics as DARE2X, in order to join forces in raising awareness about the projects’ challenges, objectives and activities. An example of these clustering activities is shown in Figure 3.



Figure 3: Sample post of the “DARE2X Clustering activities” campaign on LinkedIn

The project’s online presence is gaining increasing visibility through the social media accounts of all the project partners, who share the posts through their own channels. Most of the partners’ own institutional accounts on LinkedIn and Twitter and have already shown a high implication in generating engagement in DARE2X posts and publications.

Hashtags and Tags have been used since the launch of the social media accounts, aimed at increasing the engagement and the reach of the publications, creating a “multiplier” effect, and supporting the connection with other similar accounts. DARE2X has updated its list of hashtags as shown in Figure 4.



Figure 4: DARE2X social media - Latest updates on the hashtags

3.4 Printed and online materials

These materials are part of the communication tools and channels of the DARE2X project and were printed and distributed on each occasion, such as at fairs and conferences attended by the project partners. These materials are available in the **Results** section of the DARE2X website. Examples on the distribution of these materials are shown in Figure 5 and Figure 6.



Figure 5: DARE2X roll-up banner at the Aarhus Power-2-x Symposium 2023



Figure 6: DARE2X printed brochures at the EuropaCat 2023

3.5 Press releases

Various press releases were shared during the project. The objective was to increase awareness and facilitate the dissemination of any DARE2X information that can be useful or relevant to the targeted audiences.

The first press release for the period covered by this deliverable was published after the second General Assembly that took place at the University of Liverpool in March 2023. Partners were



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requested to share at least one press release per year to communicate the project results to the general public in their respective countries.

All the shared press releases can be found on the project’s website, in the **Results** section. The second project Press Release is shown in Figure 7.



Figure 7: Second DARE2X project press release

3.6 Articles and general magazines

In parallel to the communication channels and means described above, DARE2X also communicates its latest news through the general media, such as local newspapers and specialised trade magazines (both printed and online).

News, interviews, and articles covering added-value aspects of the project were published in these media to spread a wider interest and awareness of the subject areas addressed in DARE2X and its R&I activities, with the support of the project consortium.

During the first project period, DARE2X was portrayed by 10 Danish media, as shown in Table 4.

Table 4: DARE2X articles published on general media.

NAME AND TARGET OF THE MEDIA	TITLE OF THE NEWS/ARTICE	DATE	LINK
Ingénue: Specialized newspaper for Danish Engineers	<i>Teknologisk Institut i spidsen for internationalt projekt: Plasma til fremstilling af grøn ammoniak. // Technological Institute at the forefront of international project: Plasma for the production of green ammonia.</i>	03/02/2023	LINK
Automatik & proces: Online media focused on automation and processes.	<i>PtX-projekt skal skabe grøn energi. Et internationalt projekt, ledet af Teknologisk Institut, skal gøre det muligt at producere fossilfri ammoniak til gødning og brændstof ved hjælp af Power-to-X, PtX. // PtX project must create green energy. An international project, led by the Danish Technological Institute, will make it possible to produce fossil-free ammonia for fertilizer and fuel using Power-to-X, PtX.</i>	03/02/2023	LINK
Effektivt Landbrug: Online media focused on agriculture.	<i>Fossilfri gødning og skibsbrændstof skal produceres med grøn energi. Nyt internationalt projekt skal gøre det muligt at producere fossilfri ammoniak til gødning og brændstof ved hjælp af Power-to-X. // Fossil-free fertilizer and marine fuel must be produced with green energy. New international project will make it possible to produce fossil-free ammonia for fertilizer and fuel using Power-to-X.</i>	03/02/2023	LINK
Alt om teknik: Online media about all kinds of technical solutions			LINK
Søfart: Media about marine sector			LINK
Maritime Danmark: Online media focused on the maritime industry in Denmark	<i>Nyt dansk ledet Power-to-X projekt. // New Danish-led Power-to-X project.</i>	03/02/2023	LINK
ShippingWatch: Online media focused on news related to the shipping industry	EU project aims to make marine fuels with green energy. A new international project intends to use surplus energy to produce ammonia fuel for ships.	06/02/2023	LINK
Dansk Kemi: Online Media focused on chemistry in Denmark	<i>Brug af plasma i PtX-anlæg skal gøre produktion af ammoniak langt mere grøn. // Using plasma in PtX plants should make the production of ammonia much greener.</i>	06/02/2023	LINK
ELFOKUS: Online media for electricians and electrical engineering	<i>Nyt projekt skal udvikle PtX-anlæg der kan placeres lokalt ved vindmøller og solceller. // New project to develop PtX facilities that can be placed locally at wind turbines and solar cells.</i>	08/02/2023	LINK
Klimafokus: Online media focused on climate and environmental technologies.	<i>Ny PtX-teknologi anvender plasma og kan gøre ammoniakproduktion langt mere grøn. // New PtX technology uses plasma and can make ammonia production much greener.</i>	08/02/2023	LINK



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3.7 Newsletter

DARE2X newsletters are meant to provide the latest updates on the project's achievements and results, milestones (MS) reached, the experiments developed, the latest scientific publications, as well as the conferences and seminars where the project is presented and the clustering activities.

The Newsletter is distributed to the subscribers - a specific webpage tab was created to allow visitors to subscribe directly to the newsletter - and shared on the project website and social media at least once per year and in English version. The objective is for the partners to be able to rewrite it and repurpose it in their own language were needed, creating hence a major impact of the project.

The first DARE2X newsletter was published in M14, when the first technical milestones were reached, namely *MS2 Prototype at lab-scale of plasma reactor* and *MS4 First catalyst candidates ready for enhanced plasma reactor*, and the details of this [first DARE2X newsletter](#) are shown in Figure 8. A tailored multichannel campaign calling for subscribers was launched when releasing this newsletter. The fact that the newsletter contained information on key progresses of the project activities, it attracted a wider audience, particularly in the scientific and industrial communities.



Figure 8: First edition of the DARE2X newsletter



Engagement of the audience with the newsletter is shown in Figure 9, indicating a total of 48 visitors who clicked through its contents. Notably, 12 of these visitors originated from our subscriber list, while others were referred from various external sources. In particular, 10 visitors navigated to the newsletter from the project website, with additional referrals stemming from our LinkedIn profile (14 visitors) and X profile (8 visitors).

This data underscores the diverse channels through which our newsletter reached its audience, reflecting a comprehensive dissemination strategy aimed at maximising visibility and engagement.

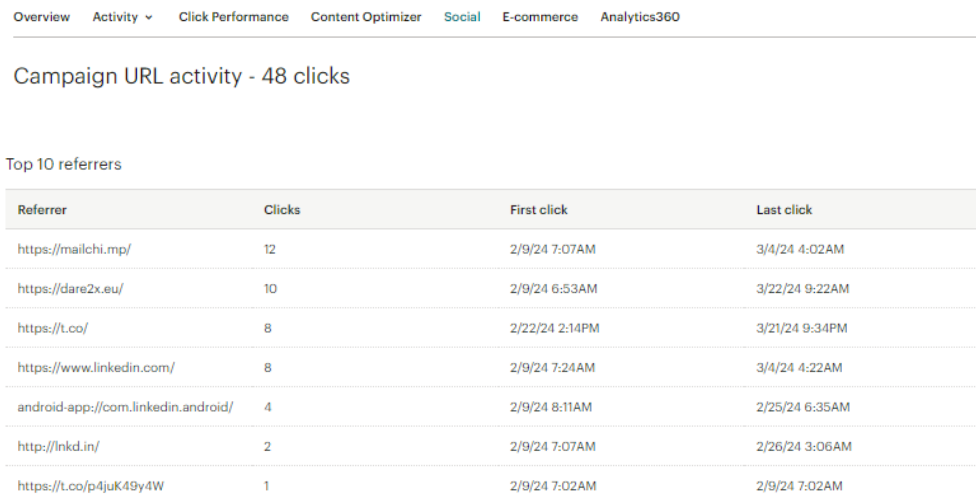


Figure 9: DARE2X newsletter URL activity

3.8 Events: attended and organised

DARE2X partners identified and attended different types of events relevant to increasing awareness about the project for a variety of relevant audiences. Updates on these events are provided by each partner in the D&C Questionnaire, available in the internal project’s repository (ANNEX I: D&C QUESTIONNAIRE FOR PARTNERS).

LOMARTOV requests additional information to the partners about these events such as the exact names of the people attending, dates, photos, abstracts or materials they presented. This additional information is then used for communication via the social media accounts of the project.

Table 5 provides a complete account of the events identified, mainly conferences and symposiums, targeting the scientific community, that the partners have attended during the period covered by this deliverable. This list is constantly updated and circulated to the members of the consortium so they could participate and either give a presentation, or simply cease the opportunity to distribute communication materials of the project.



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Table 5: Events attended by DARE2X partners

PARTNER	NAME & LINK OF THE EVENT	PLACE	DATE	TARGET AUDIENCE
LOM	Standardisation in practice: When is the right time for standardisation in research processes?	Online	02/2024	Industry, clustering, and policymakers
LOM	Boosting standardisation in R&I projects - Achievements, experiences and the road ahead	Online	01/2024	Industry, clustering, and policymakers
UoL	9th Asia-Pacific Congress on Catalysis (APCAT-9)	Hangzhou, China	11/2023	Scientific and Catalysis community
UoL	4th International Symposium on Catalytic Science and Technology in Sustainable Energy and Environment	Beijing, China	10/2023	Scientific and Catalysis community
UoL	5th International Symposium on Plasma and Energy Conversion (iSPEC2023)	Nanjing, China	10/2023	Catalysis community
DTI	Joint Session on Plasma Catalyst project at Lund University	Lund University, Sweden	09/2023	Scientific community from the plasma sector
UoL	Technical Meeting on Emerging Applications of Plasma Science and Technology	Vienna, Austria	09/2023	Catalysis community, Policymakers
NIC	Slovenian Chemical Days 2023	Portorož, Slovenia	09/2023	Scientific community in general
UoL & HB	15th European Congress on Catalysis - EUROPACAT 2023	Prague, Czech Republic	08/2023	Catalysis community
UoL	2nd Workshop on Catalytic Reactions with Ion Transfer through Interfaces (ITICAT2023)	Espoo, Finland	08/2023	Catalysis community
UoL	21st National Conference on Catalysis of the Chinese Chemical Society	Kunming, China	07/2023	Scientific community from the ammonia sector
UoL	2nd Symposium on Ammonia Energy 2023	Université d'Orléans, France	07/2023	Scientific/Industry community from the ammonia sector
UoL	The Ammonia Economy – Making, Breaking and Utilising Ammonia	Nottingham, UK	06/2023	Scientific/Industry community from the ammonia sector
DTI	Aarhus Power-to-X Symposium 2023	Aarhus, Denmark	06/2023	Industry and stakeholders from the ammonia sector



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PARTNER	NAME & LINK OF THE EVENT	PLACE	DATE	TARGET AUDIENCE
DTI	6th European Power to Ammonia[®] Conference	Rotterdam, Netherlands	06/2023	Scientific community from the ammonia sector
UoL	25th International Symposium on Plasma Chemistry (ISPC25)	Kyoto, Japan	05/2023	Plasma & chemistry community
UoL	243rd ECS Meeting with the 18th International Symposium on Solid Oxide Fuel Cells (SOFC-XVIII)	Boston, USA	05/2023	Electrochemistry community
UoL	Sustainable nitrogen activation: Faraday Discussion	London, UK	03/2023	Chemistry community
LOM	Materials for Sustainable Development (MATSUS 2023)	Palacio de Congresos, València	03/2023	Scientific & Chemistry community

An important achievement of DARE2X is the organisation of a successful roundtable webinar with three sister projects. The title of the webinar is "*Discussing the latest Power-2-X technology developments and how they add commercial value*". Representatives of each one of the projects presented their technological advancements and value proposition, from the commercial point of view. More details about this webinar are provided in [the article prepared for the DARE2X website](#) and Figure 10 shows the webinar banner.



Figure 10: DARE2X Roundtable webinar banner

In the next period and up to the end of the project, DARE2X plans to keep up participating in universities and schools, conferences, seminars, and technical-industrial fairs to present and give lectures spreading the project results, while also conducting face-to-face meetings to establish business opportunities. Additionally, the following events will also be organised by the project:



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- **1 Industrial workshop** organised by the D&C leader (LOM) aimed at the industrial community and other similar projects working on the same topics as DARE2X.
- Different **guided visits to the laboratories of the scientific partners**, to show the demonstrators.
- **1 webinar for the scientific and research community** to discuss the main outputs and challenges of the project, as well as to promote new fields for multidisciplinary collaboration.
- **1 Final event** co-organised by the D&C leader (LOM) and all project partners, to present the results of the project and promote the further uptake of the solutions developed.

3.9 Promotional video

A promotional video of DARE2X project is planned to be released at M34 to communicate the project activities in a universal way. The video will show the project partners presenting the main challenges addressed by the project (through interviews and/or through infographics) and how the R&I activities developed constitute a valuable solution for the decarbonisation of many strategic sectors of the European industry. The preparation of video is planned to start from M20 when more tangible project results are available.



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4. Dissemination tools and channels

As explained earlier, the objectives of the Dissemination and those of the Communication are complementary and for this reason the contents, materials, means and channels of communication activities are also designed and used for dissemination purposes by making them publicly available and easily accessible.

In this sense, the D&C plan uses and will intensify the use of a universal language, particularly as we are reaching a turning point in the project where more tangible results will be available. To do this, a list of good practice guidelines will be drafted and implemented to encourage an effective science communication that reaches wider audiences and contributes to citizen scientific literacy and engagement with the project. A set of examples provided by the European Research Executive Agency will be used for preparing these guidelines (European Commission, 2022).

4.1 Publications

The DARE2X D&C questionnaire presented earlier was updated in order to collect and monitor partners' publications, being these a key element of the dissemination objectives. Table 6 lists the publications released by each partner in the latest period. These publications consist mainly in articles, press releases and news in local or regional magazines, supporting the dissemination of the project.

Table 6. Publications released by DARE2X partners

PARTNER	TITLE OF THE PUBLICATION	DATE	TARGET AUDIENCE
UoL	Plasma-enhanced Ammonia Synthesis via Surface Micro- Discharge: Impact of Ni and Co Catalyst Deposited on a Nickel Foam Electrode (Paper status: to be accepted)	03/2024	Scientific community
LOM	<u>1st DARE2X Newsletter</u>	01/2024	General public, scientific community
LOM & HB	<u>Green Ammonia: A Sustainable Alternative for the Energy Transition</u>	09/2023	Local media in Lund/Malmö
UoL	<u>Innovate UK funded projects since 2004</u>	07/2023	UKRI Programme
DTI	<u>Automatik & Proces – Politikere fik indblik PtX-værdikæden</u>	03/2023	Digital Newspaper – Regional (Denmark)
LOM	<u>2nd DARE2X GA in Liverpool</u>	03/2023	General public, scientific community
DTI	<u>Effektivt Landrug - Fossilfri gødning og skibsbrændstof skal produceres med grøn energi</u>	02/2023	Digital Newspaper – Regional (Denmark)
DTI	<u>Altomteknik - Teknologisk Institut – Fossilfri gødning og skibsbrændstof skal produceres med grøn energi</u>	02/2023	Digital Newspaper – Regional (Denmark)



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PARTNER	TITLE OF THE PUBLICATION	DATE	TARGET AUDIENCE
DTI	Søfart - Fossilfri gødning og skibsbrændstof skal produceres med grøn energi	02/2023	Digital Newspaper – Regional (Denmark)
DTI	Maritime Danmark - Nyt dansk ledet Power-to-X projekt	02/2023	Digital Newspaper – Regional (Denmark)
DTI	ELFOKUS - Nyt projekt skal udvikle PtX-anlæg der kan placeres lokalt ved vindmøller og solceller.	02/2023	Digital Newspaper – Regional (Denmark)
DTI	Klimafokus - Ny PtX-teknologi anvender plasma og kan gøre ammoniakproduktion langt mere grøn.	02/2023	Digital Newspaper – Regional (Denmark)
DTI	ShippingWatch - EU project aims to make marine fuels with green energy	02/2023	Digital Newspaper
DTI	Dansk Kemi - Brug af plasma i PtX-anlæg skal gøre produktion af ammoniak langt mere grøn	02/2023	Digital Newspaper – Regional (Denmark)
DTI	Ingénue - Teknologisk Institut i spidsen for internationalt projekt	02/2023	Digital Newspaper – Regional (Denmark)
LOM	Paving the way for Green Ammonia Production	11/2022	General public, scientific community

The D&C Questionnaire also collected an updated list of publications planned by the partners and targeted at the scientific community and academia. These are:

- *Plasma-enhanced Ammonia Synthesis via Surface Micro-Discharge: Impact of Ni and Co Catalysts Deposited on a Nickel Foam Electrode* (M18, UoL. Waiting for the confirmation).
- *Catalytic and absorption materials for low pressure NH₃ synthesis* (M18-M24, UoL).
- *NH₃ synthesis/decomposition reactions modelling* (M18-M24, NIC).
- *Catalyst scale NH₃ synthesis/decomposition reactions modelling* (M24, UoL).
- *Plasma catalytic NH₃ synthesis using multicell DBD reactor and over Ni based bimetallic catalysts* (M32, UoL).
- *Life cycle Associated with document assessment of NH₃ production at low-pressure and long-term H₂ storage strategy* (M36, ENSO).

4.2 Conferences, fairs, seminars, workshops and events

Up to M18, DARE2X partners attended prestigious scientific conferences to disseminate the project such as the [15th European Congress on Catalysis - EUROPACAT 2023](#), [the 21st National Conference on Catalysis of the Chinese Chemical Society](#), and the [6th European Power to Ammonia[®] Conference](#). A complete updated list of such events is provided in table 4 above and in ANNEX I: D&C QUESTIONNAIRE FOR PARTNERS.

5. Clustering and networking activities

Task 7.5 Clustering and networking activities, a crucial part of the DARE2X D&C Strategy, aims at establishing a multilateral cooperation for exchanging knowledge and best practices between DARE2X and all relevant stakeholders in the NH₃ production, storage, and its sectors of applications. In the previous version of this deliverable, D7.1 D&C Plan, an initial list of relevant EU projects, associations and companies were presented. Other EU-funded projects, initiatives, and associations relevant in these sectors have been selected to find synergies and set a common ground for joint D&C activities.

These clustering and networking activities are constantly updated in the D&C questionnaire, especially to track if DARE2X partners reached out to these projects or companies for potential collaboration opportunities or joint publications, events, or workshops. In this regard, up to M18, the consortium built cooperation with the projects [HyStrAm](#), [CAMPFIRE](#), [HiPowAR](#), [MOF2H2](#), [UP-TO-ME](#), [SOLARX](#), [SUNSON](#), and [RECYCALYSE](#), by agreeing together on targeted clustering activities which include:

- **Joint social media posts (Figure 11):** both DARE2X and the clustered projects will mutually communicate about their respective news, objectives and results.

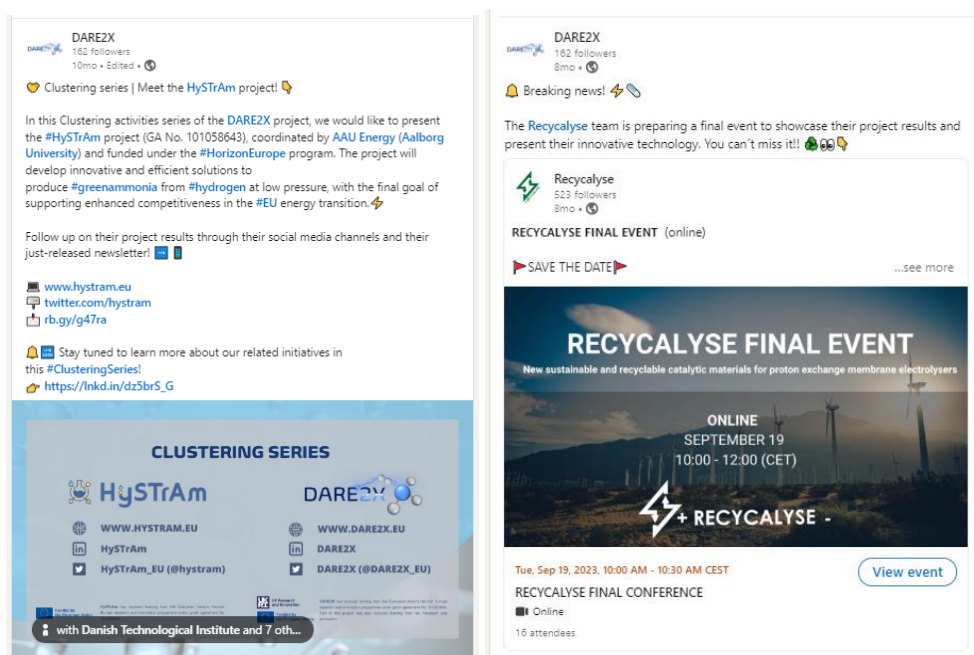


Figure 11: Examples of joint social media posts

- **Joint publications on the websites (Figure 12):** both DARE2X and the clustered projects can write joint articles and press releases to be published on their websites, focusing on common challenges and joint technical approaches to develop their solutions.



How will RECYCALYSE and DARE2X contribute to improving the non-battery-based energy storage sector?

Search

Type keyword here

Recent posts

- DARE2X Projects General Assembly Fuels Progress and Innovation
9 de February de 2024
- Project Milestones: Advancing the Frontiers of Ammonia Production
8 de February de 2024
- DARE2X Hosts Successful Roundtable Webinar on Power-to-X Technologies
17 de January de 2024

Figure 12: Example of joint publication

- **Joint factsheet (Figure 13):** the clustered projects publish joint factsheets, infographics or posters on similar issues dealt with by these projects.



Figure 13: Example of joint factsheet

- **Joint webinars and events (Figure 14):** the organisation of joint webinars aimed at a more technical, industrial, and scientific audiences is also part of this cooperation, as well as mutual invitations to each other’s official conferences and events. This activity



can be particularly beneficial for both DARE2X and the clustered projects in order to multiply the impacts towards key stakeholders and capitalise on the D&C efforts, especially for market uptake.



Webinar



Detalles

Roundtable Webinar - Discussing the Latest Power-2-X Technology Developments and How They Add Commercial Value

Delve into the cutting-edge developments of Power-2-X technologies and their potential to accelerate Europe's journey towards net-zero emissions.

In this roundtable, our panel of experts will discuss their disruptive Power-2-X solutions using renewable energy for the sustainable production of chemicals and fuels.

If you're eager to understand the energy efficiency and commercial value of Power-2-X, don't miss this insightful conversation.

Register now to be part of the discussion!

Este evento ya ha pasado.

Detalles

mié, 13 dic

15:00 - 16:00 CET

En línea

Registrar

Figure 14: An example of a joint webinar

Regarding the associations, partnerships and companies, the consortium will continue to establish relationships with them and to find the right opportunities to engage with them in relevant D&C activities that are beneficial to their members and/or to their industrial activities. The data collected through the stakeholder analysis that will be carried out by each partner and described earlier will help grow DARE2X stakeholder database.



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6. Indicators, targets, and metrics

6.1 D&C KPI monitoring

Monitoring is key to ensuring a high-quality communication strategy execution. In DARE2X, continuous assessment of the KPIs as established in the project proposal (Table 1) is carried out. These KPIs are values that state what the project seeks to achieve and to produce in terms of desired impacts at scientific, economic and societal levels.

To facilitate an accurate monitoring and assessment and to understand the impact of the activities carried out, LOM constantly encourages the members of the consortium to record the activities they implement and to save evidence.

Table 7 shows the main KPIs defined for each group of D&C activities according to the main targeted audiences. For each set of D&C tools and channels, a cross indicates if the actions are targeting either communication (C) and/or dissemination (D) purposes.

Table 7: Summary of the of DARE2X's D&C activities, including KPI and target groups

TOOLS & CHANNELS	TARGET GROUP	C	D	KPI
<ul style="list-style-type: none"> Events attended and organised, especially industrial fairs. Organisation of a workshop. Distribution of project's communication materials. 	Industry stakeholders and technology developers.	X	X	<ul style="list-style-type: none"> At least 50 companies reached directly as engaged stakeholders during the project. Participation in at least 10 European industry-relevant events.
<ul style="list-style-type: none"> Events attended and organised, especially conferences and seminars. Distribution of project's communication materials, especially the e-Newsletter. Scientific publications. 	Scientific-technical Community	X	X	<ul style="list-style-type: none"> Participation in at least 12 International scientific-technical events, reaching at least 40 participants to the webinars and other events. At least 10 publications/articles for specialised media.
<ul style="list-style-type: none"> Invitation to the Clustering & international workshops and other projects key events. Invitation to guided visits to the laboratories of the scientific partners. 	Political stakeholders	X		<ul style="list-style-type: none"> Participation of policy representatives in events organised by the Consortium.
<ul style="list-style-type: none"> Invitation to project's events. Invitation to guided visits to the laboratories of the scientific partners. 	Social actors (civil society, environmental agencies etc.).	X		<ul style="list-style-type: none"> At least 1 social stakeholder reached per partner, with an impact communication capacity of more than 200 people.



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TOOLS & CHANNELS	TARGET GROUP	C	D	KPI
<ul style="list-style-type: none"> Social media campaigns & distribution of project's communication materials. 				
<ul style="list-style-type: none"> Articles and scientific publications with technical and economic information. Interviews of project partners. invitation to attend project's events and guided visits. 	Specialised media		X	<ul style="list-style-type: none"> At least 10 publications/articles in specialised media, reaching more than 500 readers.
<ul style="list-style-type: none"> Press releases & interviews in partners' countries. Invitation to attend project's events and guided visits. Distribution of project's communication materials. 	General media	X	X	<ul style="list-style-type: none"> 1 press release per year per partner. 1 project video shared through online general media.
<ul style="list-style-type: none"> Press releases & interviews in in local media of partners' countries. DARE2X promotional video on social media and specific social media campaigns. Visits of local secondary schools to give a lecture on H₂/NH₃ energy and climate change. Presentation at Liverpool Pint of Science for public. 	General public	X		<ul style="list-style-type: none"> At least 30,000 people reached throughout all communication activities.

Up to M18, the consortium's work was focused on establishing the main tools and channels in order to reach the target groups through the communication of key messages. As shown also in Chapters 3 and 4, the **main progresses in reaching these KPIs have been achieved in the following activities:**

- **18** industrial companies reached as engaged stakeholders.
- Participation in **11** European industry-relevant events.
- Participation in **8** International scientific-technical events.
- Organisation of **1** webinar for scientific-technical community.
- Submission of **1** abstract by Hulteberg Chemistry and Engineering AB to attend the [15th European Congress on Catalysis - EUROPACAT 2023](#) and present DARE2X.
- Publication of **8** articles on **10** different media, both general and specialised magazines.
- Publication of **4** press releases after the Kick-off Meeting and General Assemblies on the project and partners' websites.
- Launch of **5** social media campaigns, "Meet the partners" "Reached a milestone", "DARE2X news & updates", "DARE2X events", and "Subscribe to our newsletter", in order to reach the widest number of audiences possible and maintain DARE2X social media constantly active.



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6.2 Website and social media metrics

Besides the KPIs established in the project proposal, another important indicator of the performance of the D&C activities, the visibility of the project and the profile of the target audiences reached is the analysis of the website and social media statistics.

The **website of the project** was launched in January 2023 and the following screenshots, extracted through Google Analytics, show the main numbers reached for each indicator from the 1st of January 2023 up to the 14th of March 2024.

Figure 15 shows that DARE2X website engaged **3.6K views** and **1K users** since its launch, with an average **engagement time of over 1 minute** and **an engagement rate of 51.3%**. This result is highly positive showing that more than half of our visitors interact with web elements after arriving to the site.

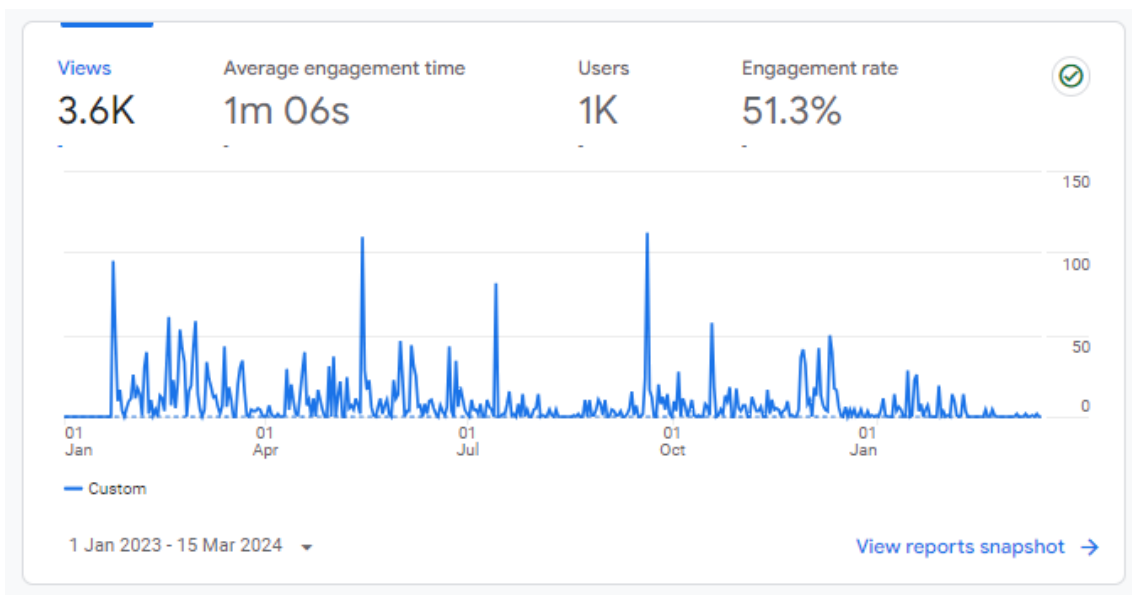


Figure 15: General statistics on the users of DARE2X website

When analysing the visitors of **DARE2X website by country**, we can observe that website users are from all over the world, particularly from Spain, Denmark, China, and the US (Figure 16). This data reveals that green ammonia production is an issue of interest in many countries beyond the European Union frontiers, confirming the interest North American and Chinese industries show in European R&I projects working on this topic.



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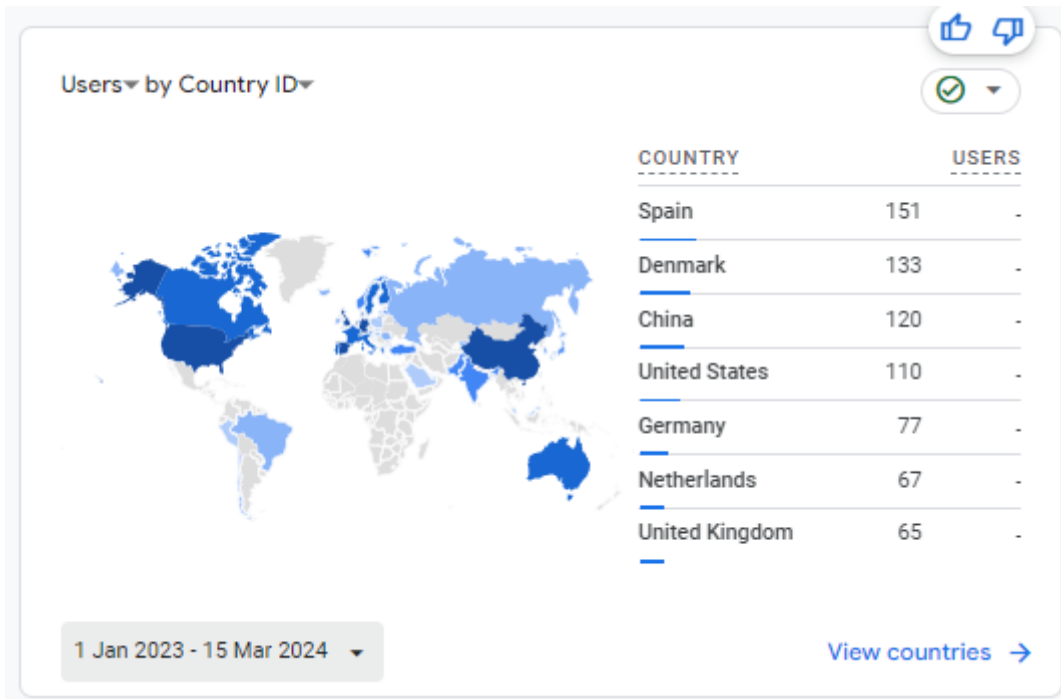


Figure 16: Users of DARE2X website according to the country identification

Finally, by looking at the pages of the website that attract more visitors, as shown in **Error! Reference source not found.**, it is interesting to observe that the sections of the website that are most visited are the ones that include more descriptive and informative text about the project, i.e. “Home” which summarises all the main information; “Project” which describes the objectives and activities; “News & Events” which details the entities behind the DARE2X consortium.

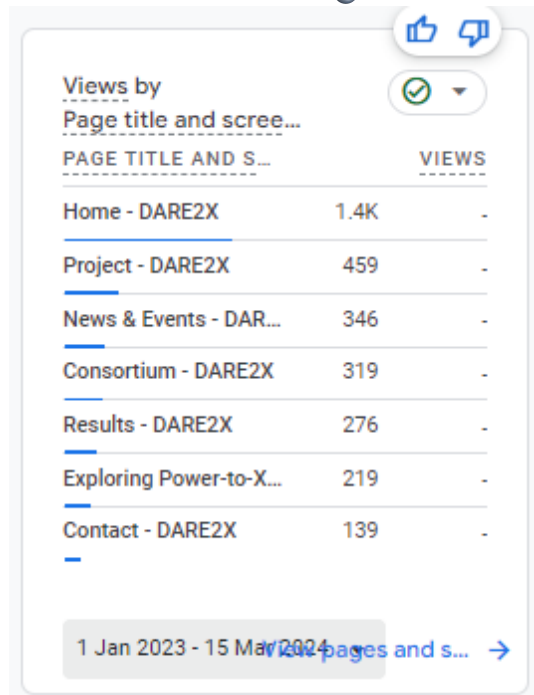


Figure 17. Views of DARE2X website by pages

Concerning the **social media accounts, LinkedIn (#DARE2X) and Twitter (@DARE2X EU) analytics** also allow to have a clearer view of the profile of the stakeholders attracted through these first D&C activities. From the 14th of December 2022 up to the 14th of March 2023, LinkedIn statistics allow to analyse the data both from the followers (i.e., people actively following DARE2X LinkedIn page) and the visitors point of views (i.e., people who are not subscribed and visit the page only occasionally). Figure 18 and Figure 19 highlight the main points of attention to be discussed.

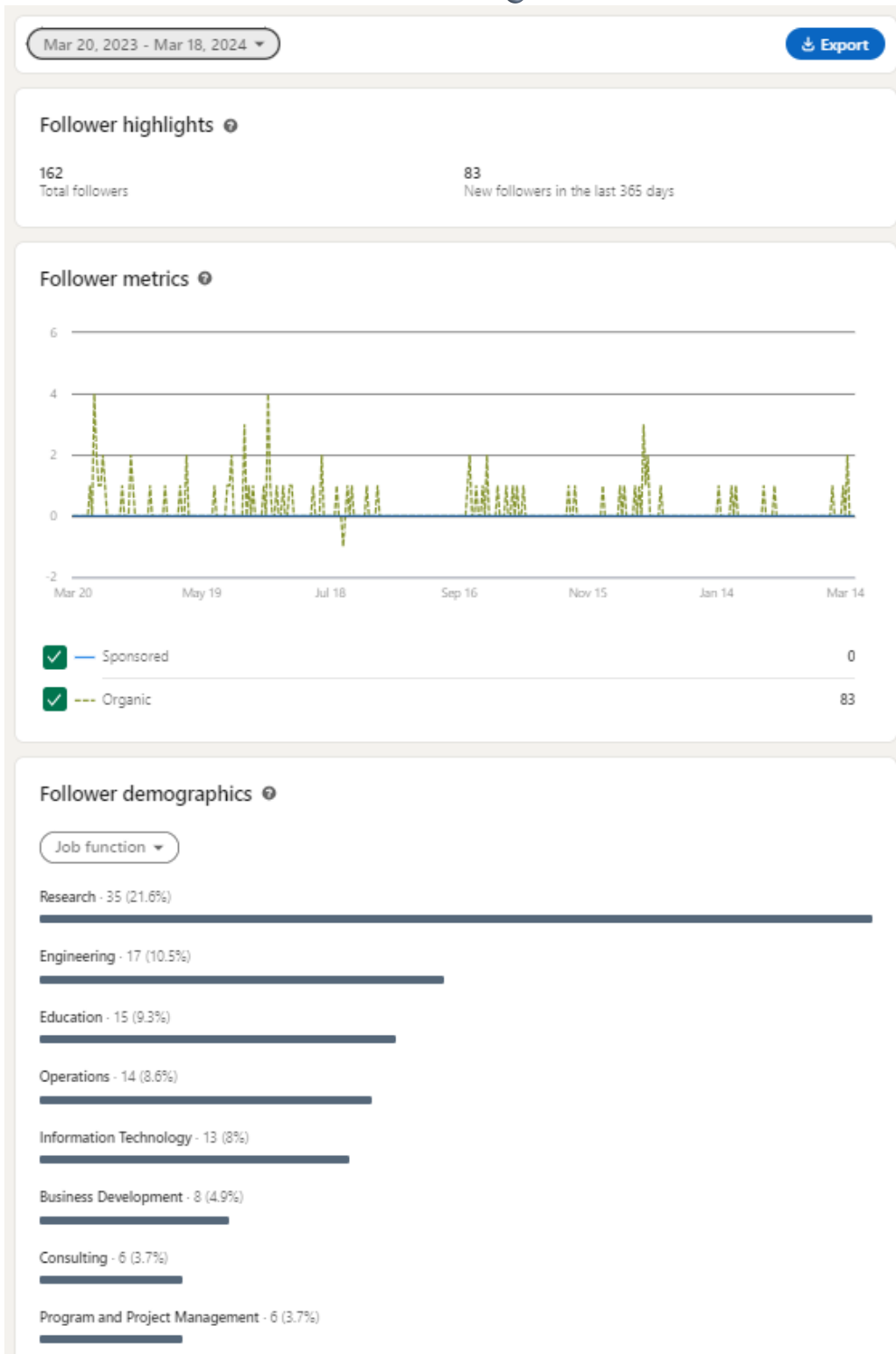


Figure 18: DARE2X LinkedIn follower analytics

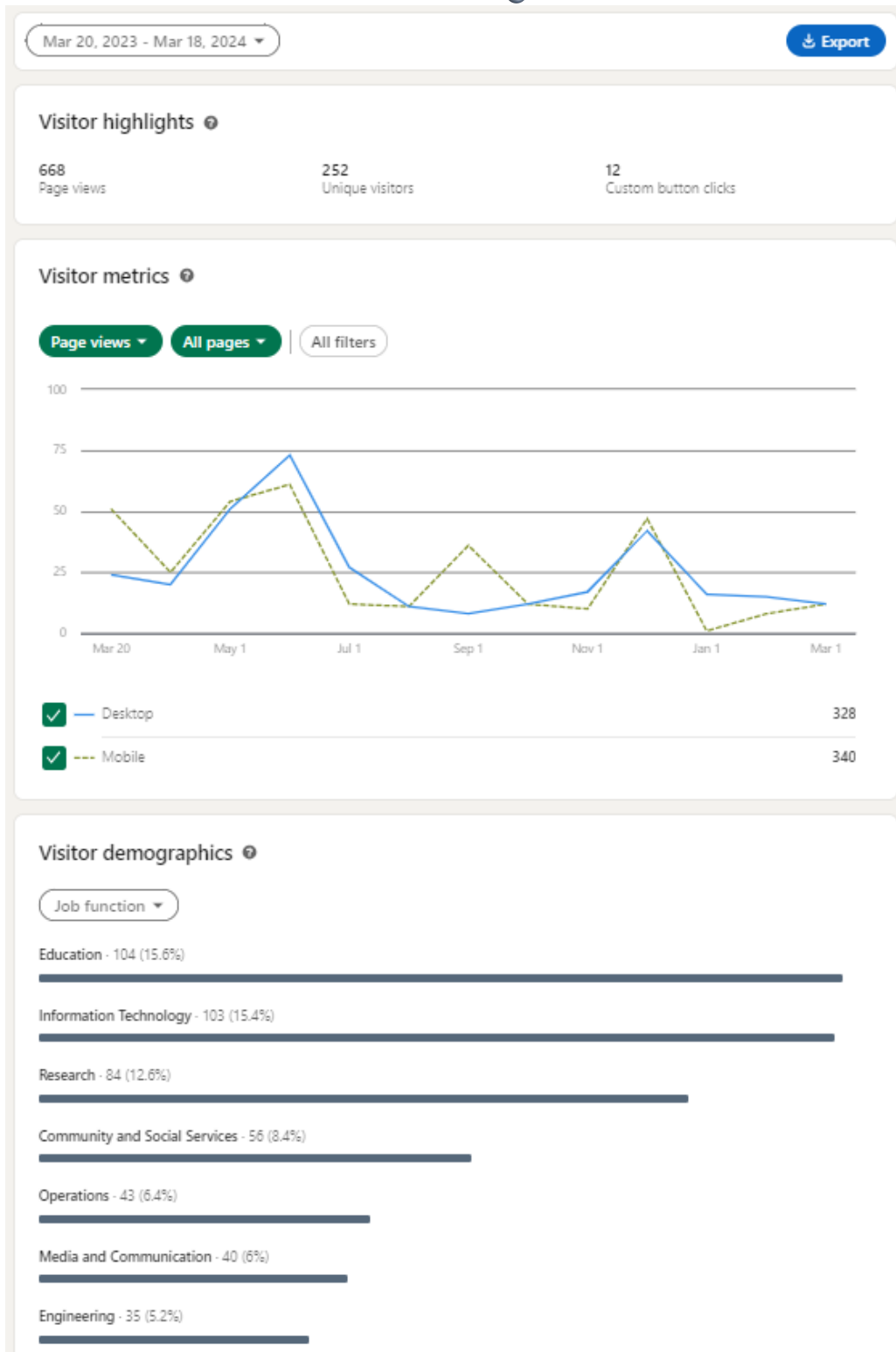


Figure 19: DARE2X LinkedIn visitor analytics



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From the followers' statistics, Figure 18 shows that DARE2X has gained **162 followers on LinkedIn**. These actors show a constant activity through the profile. According to their professional sector, more than **20% come from the R&I sector**, while other representative sectors include engineering (10%), education (9%), operations (8%) and IT (8%).

Regarding the visitors of DARE2X LinkedIn profile, Figure 19 shows that the page gained over **660 visitors**, of which 252 are unique visitors. Regarding their professional sector, we can emphasise the **diversity of sectors**, being **education, IT, and research backgrounds** the most represented (with 15.6% 15.4%, and 12.6% of the visitors, respectively).

Regarding **Twitter analytics**, DARE2X counts **51 followers** on this channel. Figure 20 shows that this number is relatively low compared to the number of followers on LinkedIn and this is quite common for Twitter accounts of European projects. Nevertheless, the shared content shows good results in terms of impressions, and our quarterly engagement has been around 4% during the last year. The DARE2X tweets gained over **1,000 impressions** between December 2023 and March 2024, showing a high level of visibility of the posts released during the project.

The analysis of the website and social media metrics shows that these tools have reached a satisfactory level of engagement among viewers, and that they are certainly valuable for the dissemination and communication of the project results and activities.

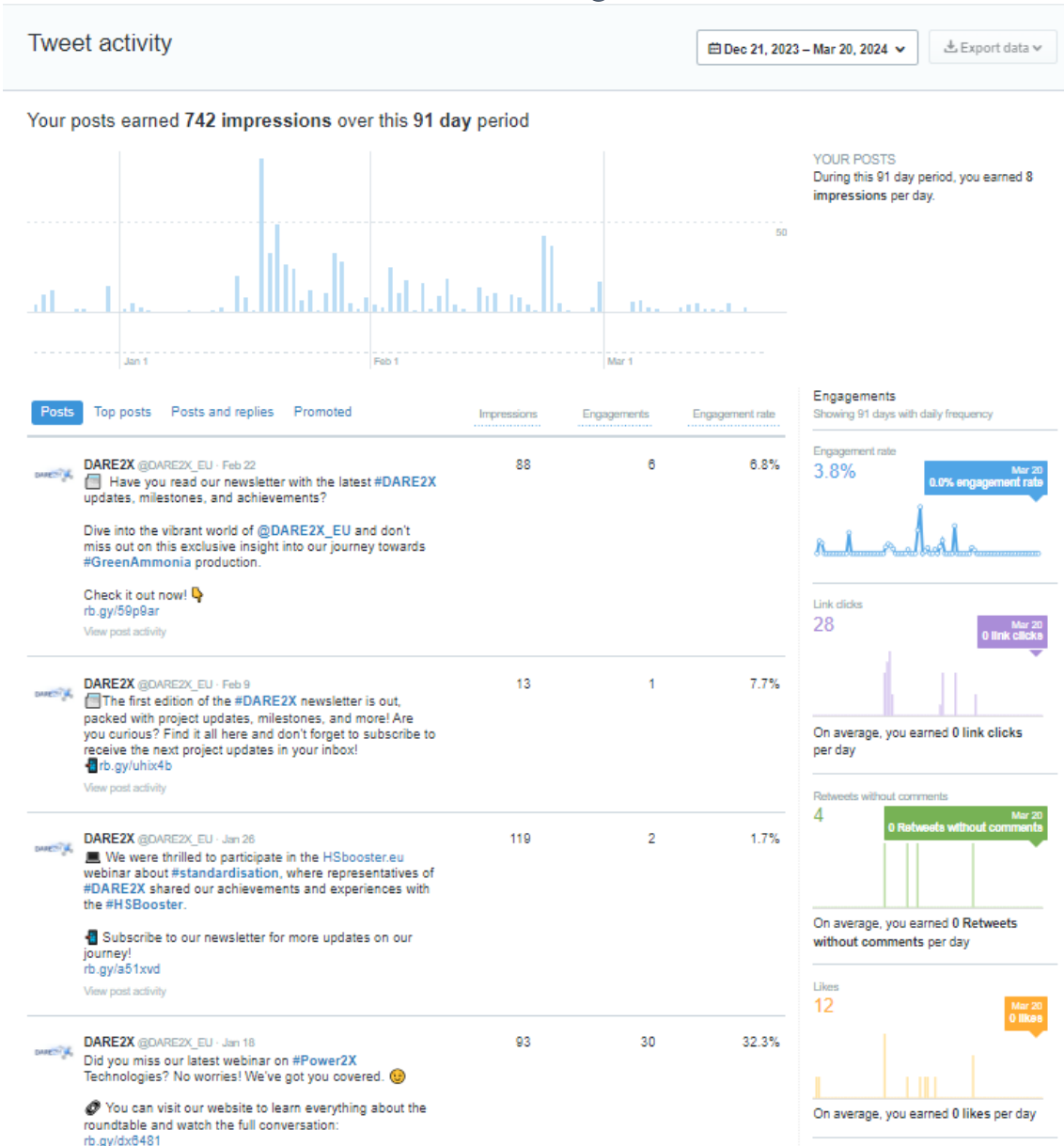


Figure 20: DARE2X Twitter analytics

7. Data Management Plan and Intellectual Property Rights

Along with the completion of deliverable D7.2 - Dissemination and Communication Plan - Version 2, the Data Management Plan (DMP) has been updated to ensure an adequate management of all project information. The objective of the DMP is to coordinate and integrate all the data that the DARE2X project generates during its lifetime, and to manage how it will be accessed, exploited, and preserved in the afterlife of the project, according to the Findability, Accessibility, Interoperability and Reusability principles (i.e. FAIR principles). The DMP also serves to collect the KERs from the partners as part of Task 7.2 Market Analysis & Watch Activities for DARE2X exploitation strategy.

Although the Grant Agreement foresees only one version of the Data Management Plan (D1.2) delivered in Month 6, LOM constantly updates it via a data collection sheet completed by the partners on a regular basis and that will be integrated in the periodic reports of the project.

During the lifetime of the project, and as soon as the scientific and industrial partners produce the first outputs, these aspects are addressed from the D&C perspective, considering the classification of the information contained in the DMP, and ensuring that D&C tools and channels also serve as a mean to implement the FAIR principles when it comes to public data.

The DARE2X project defines rules for the Intellectual Property Rights (IPR) over the knowledge gained in the project, focusing on the communication to the general public, the dissemination of new knowledge both within and outside of the consortium, and the implementation of the current EU R&D legal framework to ensure the development of the technology is protected, disseminated, and exploited to its full potential. These IPR rules are described in Articles 16, 17, and in Annex 5 of the GA.

The DMP and IPR rules are also managed and controlled through Task 1.3 – IPR and Data Management Plan (from the WP1) and the Task 7.2 Market Analysis & Watch Activities for DARE2X exploitation strategy (from the WP7). Therefore, updates on DMP and IPR will also be provided in the deliverables associated with these tasks.

8. Conclusions

DARE2X is an ambitious R&I project researching a new process to produce and decentralise the production of green ammonia as a key chemical to enabling the green energy transition. With such a strategic objective, the consortium has recognised the importance of establishing an ambitious and effective D&C plan defined in the present deliverable D7.2.

Taking into consideration the double objective of the D&C plan, up to M18 – March 2024 – the DARE2X consortium has made significant strides in **establishing effective communication channels and tools to engage with target audiences and disseminate key project messages**. As outlined in *Chapter 3 Communication tools and channels*, *Chapter 4 Dissemination tools and channels* and *Chapter 5 Clustering and networking activities*, notable progress has been achieved across various activities, meeting thus the key performance indicators (KPIs) of the plan.

These achievements include engaging with a significant number of stakeholders, participating in numerous EU industry-relevant and international scientific-technical events, and organising a successful webinar for the scientific-technical community. Additionally, the consortium has actively promoted project updates and milestones through the publication of articles in both general and specialised media, as well as distributing press releases following the Kick-off Meeting and General Assemblies.

The launch of targeted social media campaigns and the project's newsletter has enabled widespread outreach to stakeholders, ensuring active engagement and visibility for DARE2X across various platforms.

Thanks to the engagement of the project partners, all these efforts have shown that DARE2X is progressing positively towards the effective implementation of its D&C strategy to produce the desired impacts at scientific, economic, and social level.

This D&C Plan is an updated version of the first one and covered the period from Month 7 until Month 18 of the project implementation. A third and final version will be delivered at M36, in September 2025.

9. References

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European Commission, European Research Executive Agency (2021). What is the difference between dissemination, exploitation, and communication. Retrieved from: <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/support/faq/933>

European Commission (2018). A Clean Planet for all. A European strategic long-term vision for a prosperous, modern, competitive, and climate-neutral economy.



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ANNEX I: D&C QUESTIONNAIRE FOR PARTNERS



This questionnaire consists of five tabs covering different topics and information that LOMARTOV will collect throughout the project in order to fulfill the objectives of WP7. The purpose of this questionnaire is to collect as much information as possible to help define the communication, dissemination, and exploitation of the project. This questionnaire will be sent to you every six months, and you will be responsible for updating it with new information.

- 1) **Publications released and foreseen** during the whole duration of the project. You can choose in the scroll down menu: Paper, Magazine, Website, Other
- 2) **Participation in / organisation of events.** Report all relevant data regarding any event related with DARE2X that you have attended or organised.
- 3) **EU Projects** - possible synergies with DARE2X. Comment if one of the project selected is not relevant for you and add any other relevant project which we should consider to establish synergies.
- 4) **Social media activity.** Indicate the number of followers you have reached up to the current date.
- 5) **Private companies and organisations** that can be crucial to exploit and further scale-up DARE2X results. Indicate any relevant company or industrial partner which could be crucial for the future upscale and exploitation of DARE2X. These actors could also be part of the Advisory Board.

Please note the following:

- 1) Sometimes it won't be possible for you to fill out all entries for a given activity (e.g. the estimated audience at events where you presented/are going to present the project). That can happen and it is OK, just please keep in mind that the more inputs you manage to provide the better, as this kind of data is requested by the European Commission.

Please check the completeness of your contribution with the communication officers of your organisation



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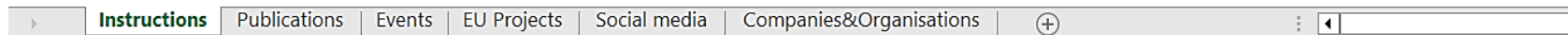


Figure 21: D&C questionnaires for partners - Instructions



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Please list the publications that you plan to release during the project with a date estimation.

Partner	Type of publication	Type of content	Title of the publication	[Expected] publication date DD/MM/YYYY	Useful information: pages, URL	Type of audience/Other comments
UoL	Paper	Article	Plasma catalysis ammonia synthesis using Ru/CeO2	M28		Scientific community
UoL	Paper	Article	Plasma catalysis ammonia synthesis using SAC catalysts	M28		Scientific community
UoL	Paper	Article	Plasma-catalytic ammonia production with Ni /zeolite 5A: effect of precursor and solvent	M24		Scientific community
UoL	Paper	Article	Ammonia production in plasma-catalytic system: effect of zeolite support	M24		Scientific community
UoL	Paper	Article	Plasma-enhanced Ammonia Synthesis via Surface Micro-Discharge: Impact of Ni and Co Catalysts Deposited on a Nickel Foam Electrode	M18	ACS Sustainable Chem Eng	Scientific community
	Paper	Article	Life cycle Associated with document assessment of NH3 production at low-pressure and long-term H2 storage strategy	M36		
	Paper	Article	Plasma catalytic NH3 synthesis using multicell DBD reactor and over Ni based bimetallic catalysts	M32		
	Paper	Article	Catalyst scale NH3 synthesis/decomposition reactions modelling	M24		
	Paper	Article	Catalytic and absorption materials for low pressure NH3 synthesis	M18-24		
NIC	Paper	Article	Scientific paper - title TBD	Jan- Dec 2024		Scientific community
	Paper	Article	Towards the understanding of the interplay between NH3 synthesis catalyst- NH3 absorption material for improving NH3 synthesis rate at low pressure	Year 2024		Scientific community
LOM	Our Website	News	Lomartov website - DARE2X News	30-Nov-2023		General public
NIC	Paper	Article	Atom scale NH3 synthesis/decomposition reactions modelling*, expected at M20	M20-M24		Scientific community
	Our Website	Other	1st DARE2X newsletter	30/1/2023		General public, scientific community
LOM		Press release	DARE2X Project Gears Up for Its Next Milestone: General Assembly in Sweden	21-Sep-2023		Addressed to local media in Lund/Malmö
		Other	Innovate UK funded projects since 2004	15-Jul-2023	https://www.ukri.org/publications/innovate-uk-funded-projects-since-2004/	Transparency data and Gateway to Research of UKRI
DTI	Magazine/newspaper	News	Automatik & proces - PIX-projekt skal skabe grøn energi. Et internationalt projekt, ledet af Teknologisk Institut, skal gøre det muligt at producere fossilt ammoniak	2-Mar-2023	https://www.automatik-og-proces.dk/nyheder-automatik-og-proces-dt/	Automatik & proces: Online media focused on automation and processes
DTI	Magazine/newspaper	News	Efektivt landbrug - Fossilm gødning og skibsrændstof skal produceres med grøn energi. Nyt internationalt projekt skal gøre det muligt at producere fossilt	2-Mar-2023	https://effektivlandbrug.landbrugnet.dk/nyheder/2023/02/03/effektivt-landbrug-fossilt/	Online media focused on agriculture.
DTI	Magazine/newspaper	Article	Allt om teknik - Fossilm gødning og skibsrændstof skal produceres med grøn energi. Nyt internationalt projekt skal gøre det muligt at producere fossilt	2-Mar-2023	https://alltomeknisk.dk/nyheder/2023/02/03/effektivt-landbrug-fossilt/	Online media about all kinds of technical solutions
DTI	Magazine/newspaper	News	Søfart - Fossilm gødning og skibsrændstof skal produceres med grøn energi. Nyt internationalt projekt skal gøre det muligt at producere fossilt ammoniak til	2-Mar-2023	https://www.sofart.dk/article/view/55716/fossilt-skibsrændstof-og-ny/	Media about marine sector
DTI	Magazine/newspaper	News	Martime Danmark - Nyt dansk leder Power-to-X projekt. // New Danish-led Power-to-X project	2-Mar-2023	https://maritimedanmark.dk/?id=50054	Online media focused on the maritime industry in Denmark
DTI	Magazine/newspaper	News	ELFOKUS - Nyt projekt skal udvikle PIX-anlæg der kan placeres lokalt ved vindmøller og solceller. // New project to develop PIX facilities that can be placed	8-Feb-2023	https://www.elfokus.dk/nyl-projekt-skal-udvikle-ny-anlaeg-der-kan-placeres-ved-vindmoller-og-solceller/	Online media for electricians and electrical engineering
DTI	Magazine/newspaper	News	Klimafokus - Ny PIX-teknologi anvender plasma og kan gøre ammoniakproduktion langt mere grøn. // New PIX technology uses plasma and	8-Feb-2023	https://www.klimafokus.dk/ny-PIX-teknologi-anvender-plasma-og-kan-gore-ammoniakproduktion-langt-mere-gron/	Online media focused on climate and environmental technologies
DTI	Magazine/newspaper	News	ShippingWatch - EU project aims to make marine fuels with green energy. A new international project intends to use surplus energy to produce ammonia fuel for	6-Feb-2023	https://shippingwatch.com/suppliers/article/14955077_eu/	Online media focused on news related to the shipping industry
DTI	Magazine/newspaper	News	Dansk Kemi - Brug af plasma i PIX-anlæg skal gøre produktion af ammoniak langt mere grøn. // Using plasma in PIX plants should make the production of	6-Feb-2023	https://www.kemifokus.dk/brug-af-plasma-i-PIX-anlaeg-skal-gore/	Online Media focused on chemistry in Denmark
DTI	Magazine/newspaper	News	Ingeniør - Teknologisk Institut i spidsen for internationalt projekt: Plasma til fremstilling af grøn ammoniak. // Technological Institute at the forefront of	3-Feb-2023	https://ingeniør.dk/nyheder/2023/02/03/teknologisk-institut-i-spidsen-for-internationalt-projekt-plasma-til-fremstilling-af-gron-ammoniak/	Specialized newspaper for Danish Engineers
LOM	Our Website	Press release	Lomartov website - Paving the way for green ammonia production	10-Nov-2022	https://lomartov.com/paving-the-way-for-green-ammonia-production/	General public

Figure 22: D&C questionnaires for partners - Publications



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DARE2X In this tab, you can include any events in which you plan to participate or organise.

Partner	Name of the event	Venue	Date (DD/MM/YYYY)	Topic	Importance for DARE2X	Type of audience (general, scientific community...)	Number of participants - Audience reached (after ...)	Link	Potential for clustering activities
DTI	Europacat25	Trondheim, Norway	31/8-5/9/2025	Catalysis	2X results and developments can be s	Scientific community from the catalysis sector, policymakers	TBD	https://www.ntnu.edu/europacat2025	
DTI	29th North American Catalysis Society Meeting (NACM)	Atlanta, GA, USA	8-13/6/2025	Catalysis	2X results and developments can be s	Scientific community from the catalysis sector, policymakers	TBD	TBD	
DTI	Hydrogen & P2X Conference 2024	Copenhagen, Denmark	19-20/6/2024	Hydrogen and Power2X technology	and Companies focused on hydrogen	Industry and researchers	~200	https://fortismedia.com/hydrogen-p2x-2024-4-jun-19-20-copenhagen	conference, potential for synergies act with other EU projects
NIC	Slovenian Chemical Days	Portoroz, Slovenia	18-20/6/2024	Modeling and/or synthesis	Presentation of scientific output	Scientific community in general	~200	https://skd2024.chem-soc.si/	
NIC	national symposium on chemical reaction engineering	Turku, Finland	18-20/6/2024	Synthesis	Presentation of scientific output	Scientific community in general		https://www.icre28.org/	
DTI	NHS Event	Rotterdam, Netherlands	6-7/6/2024	Green/ blue NH3 use and production	Dessmination and Networking	Industry and researchers	~200	https://nh3event.com/	Possibly, it's a networking event.
UoL	Plasma Processing Science Gordon Research Conference	Andover, United States	21-26/7/2024	Plasma catalysis	Presentation of scientific output	Scientific community from the catalysis sector, policymakers	~100	https://www.grc.org/plasma-processing-science-conference/2024/	
UoL	8th International Symposium on Plasmas for Catalysis and Energy Materials	Eindhoven, Netherlands	10-12/7/2024	Plasma catalysis	Presentation of scientific output	Industry and researchers	~200	https://www.ispcm24.com/	
LOM	Standardisation in practice: When is the right time for standardisation in research processes?	Online	1/2/2024			Industry, other projects, and policy		Standardisation in practice: When is the right time for standardisation in research processes? HSBooster.eu	
LOM	Boosting standardisation in R&I projects - Achievements, experiences and the road ahead	Online	16/1/2024	HS Booster	Discussion about HSBooster possibilities	Industry, other projects, and policy		Webinar: Boosting standardisation in R&I projects HSBooster.eu	
UoL	9th Asia-Pacific Congress on Catalysis (APCAT-9)	Hangzhou, China	30/10/2023-2/11/2023	Plasma catalysis	Presentation of the project	Scientific community from the catalysis sector	~700	https://www.apcat9.com/	
UoL	5th International Symposium on Plasma and Energy Conversion (ISPEC)	Nanjing, China	27-29/10/2023	Plasma catalysis	Presentation of the project	Scientific community from the catalysis sector	~350	https://www.ispec-conf.com/	
UoL	2nd Workshop on Catalytic Reactors with Ion Transfer through Interfaces (ITCAT2023)	Espoo, Finland	24-25/8/2023	Plasma catalysis	Presentation of the project	Scientific community from the catalysis sector	~100	https://www.itcat2023.com/	
UoL	IAEA Technical Meeting on Emerging Applications of Plasma Science and Technology	Vienna, Austria	19-22/9/2023	Plasma catalysis	Presentation of the project	Scientific community from the catalysis sector, policymakers	~100	https://conferences.iaea.org/event/733/	
UoL	4th International Symposium on Catalytic Science and Technology in Sustainable Energy and Environment (ISECAT)	Beijing, China	15-18/10/2023	Plasma catalysis	Presentation of the project	Scientific community from the catalysis sector	~230	https://www.isecat2023.com/	
DTI	Joint session on Plasma Catalysis projects at Lund University	Lund University	27/09/2023	Plasma catalysis	Interaction with researchers in other local Swedish projects on plasma catalysis	Scientific community from the plasma sector	15		All partners attended, it took place during the project GA in Lund
NIC	Slovenian Chemical Days	Portoroz, Slovenia	9/13/2023	Modeling and/or synthesis	Presentation of scientific output	Scientific community in general	~200	https://www.chem-soc.si/conference/	
HB	Europacat	Prague, Czech republic	8/27/2023	absorbent results	Abstract of the project	Scientific community in general	~1500 about 100 direct interactions	https://www.europacat2023.eu/	
UoL	19th European Congress on Catalysis Europacat	Prague, Czech republic	9/27/2023	Synthesis	Presentation of scientific output	Catalysis community		https://www.europacat2023.eu/	
UoL	ICGC 2023: International Conference on Green Chemistry	Venice, Italy	6/10/2023	please all partner check if you could assist this conference	First official presentation of the project in front of an audience	Scientific community from the ammonia sector		https://www.icgc2023.com/	
UoL	21st National Conference on Catalysis	Kunming, China	7/21/2023	Catalysis	Presentation of the project	Scientific community from the ammonia sector		https://www.cncc2023.com/	
UoL	Ammonia Energy symposium	Orleans	7/11/2023	Ammonia production, ammonia cracking, ammonia combustion	Presentation of the project	Scientific/industry community from the ammonia sector		https://www.ammoniaenergy.com/	Could be interesting for the first official ppt of DARE2X
UoL	Ammonia Economy - Making, Breaking and Utilising Ammonia	Nottingham	6/26/2023	Ammonia production, cracking and utilisation	Presentation of the project	Scientific community from the ammonia sector		https://www.ammoniaeconomy.com/	
DTI	Aerbus Power-to-X Symposium 2023	Aarhus, Denmark	6/12/2023	P2X technology, industrialisation to strategy and innovation	Presentation of the project	Industry and stakeholders from the ammonia sector		https://www.aerbus.com/en/innovation/energy/aerbus-power-to-x-symposium-2023	Could be interesting for the first official ppt of DARE2X
DTI	6th European Power to Ammonia Conference	Rotterdam, Netherlands	6/9/2023	please all partner check if you could assist this conference. Costs is about 149€ to present	Early 2023 the registration for this conference. Costs is about 149€ to present	Industry and stakeholders from the ammonia sector		https://www.european-power-to-ammonia.com/	Could be interesting for the first official ppt of DARE2X
UoL	243rd ECS Meeting	Boston, USA	5/28/2023	Synthesis	Presentation of scientific output	Electrochemistry community		https://www.electrochem.org/2023/	Could be interesting for the first official ppt of DARE2X
UoL	25th International Symposium on Plasma Chemistry (ISPC25)	Kyoto, Japan	5/21/2023	Plasma chemistry and plasma catalysis	Presentation of scientific output	Plasma chemistry community		https://www.ispc25.com/	Could be interesting for the first official ppt of DARE2X
UoL	Sustainable nitrogen activation Faraday Discussion	London, United Kingdom	3/27/2023	sustainable routes to ammonia production	Presentation of the project	Scientific community		https://www.rsc.org/events/detail/43194/sustainable-nitrogen-activation	Could be interesting for the first official ppt of DARE2X
LOM	MBTUS	Palacio de Congressos, Valencia	3/6/2023		Presentation of the project			https://www.mbtus.com/	Could be interesting for the first official ppt of DARE2X
LOM	6th Ammonia as Fuel World Summit 2023	Online	1/30/2023	The 6th Ammonia as Fuel World Summit 2023 has been individualy researched and curated to provide the most relevant information on ammonia as fuel	Networking / Viability of the project	Scientific community expert in the use of ammonia	>1000 attendees	https://www.ammonia-as-fuel.com/	Could be interesting for the first official ppt of DARE2X
LOM	6th AMMONIA AS FUEL WORLD SUMMIT	Online	1/30/2023		First official presentation of the project in front of an audience	Scientific community from the ammonia sector	Direct contact established	https://www.ammonia-as-fuel.com/	Could be interesting for the first official ppt of DARE2X

Figure 23: D&C questionnaires for partners - Events



Funded by the European Union

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In this tab, you can find a list of the clustered EU projects. Please add any other relevant initiative and related information.

Name of project	Link to CORDIS	Link to the project website	Coordinator	Keywords	Possible synergies with DARE2X
HyStrAm – Hydrogen Storage and Transport using Ammonia	https://cordis.europa.eu/project/id/101058643	https://www.hystram.eu/	Aalborg University Denmark	electrolysis, thermodynamics, catalysis, sorbents, energy and fuels, ammonia synthesis reactor,	kemijski institut is a partner in this project. Some synergies could be developed between these two projects.
MOF2H2 - Metal Organic Frameworks for Hydrogen production by photocatalytic overall water splitting	https://cordis.europa.eu/project/id/101084131	https://mof2h2.eu/	ECOLE SUPERIEURE DE PHYSIQUE ET DE CHIMIE INDUSTRIELLES DE LA VILLE DEPARIS France	photocatalysis, hydrogen energy	The project started in Nov 2022. Share results on water splitting technology?
ORACLE - novel routes and catalysts for synthesis of ammonia as alternative renewable fuel	https://cordis.europa.eu/project/id/101022738	Project – ORACLE (oracle-jp.eu)	AARHUS UNIVERSITET Denmark	electrocatalysis, electrolysis, energy and fuels	They hosted the first Aarhus PtX Symposium in 2022 including topics such as green fertilizer from green ammonia feedstock.
RECYCALYSE - New sustainable and recyclable catalytic materials for proton exchange membrane electrolysers	https://cordis.europa.eu/project/id/861960	https://recycalyse.eu/	TEKNOLOGISK INSTITUT Denmark	recycling, catalysis, sustainable economy	Coordinated by DTI. Sustainability aspects are also tackled by DARE2X and synergies could be established in the life cycle assessment methodology.
HiPowAR - Highly efficient Power Production by green Ammonia total Oxidation in a Membrane Reactor	https://cordis.europa.eu/project/id/951880	https://www.hipowar.eu/home	LEIBNIZ-INSTITUT FÜR PLASMAFORSCHUNG UND TECHNOLOGIE EV Germany	electrolysis, synthetic fuels, fuel cells, energy conversion	They propose a sustainable NH ₃ production and utilization in a SOFC, meaning significant decrease of primary energy demand by lower utilization of resources. The data from their study might be useful for the environmental assessment impact.
CAMPFIRE Wind and water to ammonia Marine fuel and energy storage for a zero-emission future	/	https://wir-campfire.de/en/home-02-en/	Leiterin Grüne Ammoniak Technologien Leibniz-Institut für Plasmaforschung und Technologie e.V. (INP) Felix-Hausdorff-Straße 2, 17489 Greifswald, Germany	ammonia production, renewable energies, Northern Germany	Coordinated by the same institution as HiPowAR. Larger initiatives which act in Northern Europe. Promoting different projects that could find links with DARE2X.
UP-TO-ME : Unmanned-Power-to-Methanol production	https://cordis.europa.eu/project/id/101083323	https://up-to-me.com/	VTT Technical Research Centre of Finland	methanol, ship, maritime, Heavy duty vehicles	For clustering activities: contributions to the carbon net-zero framework in EU
SOLAR X : Dispatchable concentrated Solar-to-X energy solution for high penetration of renewable energy	https://cordis.europa.eu/project/id/101084158	https://solarx-project.eu/	University of Lleida	solar, photocatalysis	For clustering activities: contributions to the carbon net-zero framework in EU

Figure 24: D&C questionnaires for partners – Clustering activities



Indicate any relevant company, industrial partner or association which could be crucial for the future upscale and exploitation of DARE2X. Associations are marked in blue. Please add any comment in the column G.

Name of the company/Organisation	Country and Headquarters	Possible synergies with DARE2X	Link to website	Have you contacted this company?	Keywords	Comments
Technip IT	Technip Energies N.V., ORIGINE, 2126 boulevard de la Défense, CS 10205,	World-leading engineering and technology player for the energy transition. Leveraging their engineering expertise and technologies to develop new projects in	https://www.technipenergies.com/en	Yes	Renewable energy, biofuels, Low carbon	
First Ammonia	OCI N.V. Honthorststraat 19 Drammenveien 131 0277 Oslo - Norway	USA based Company developing the first modular, commercial-scale plant to produce green NH3 from intermittent renewable energy and the first to use SOEC World's largest ammonia exporter of urea and ammonia combined, the largest producer of nitrogen fertilizers by production capacity in the Middle East and North America	https://firstammonia.com/	Yes	energy transition, Blue and green ammonia, bio ammonia	
Yara Clean Ammonia	Drummenveien 131 0277 Oslo - Norway	World's leading crop nutrition company and a provider of environmental and technical solutions. They also NH3 and its derivatives ammonia derivatives is the company announced in 2022 the development of the first phase of Project Catalina in partnership with Enagás, Naturgy, Fertilisera and Vestas. It is a pioneering Copenhagen start-up on green ammonia production based on Lithium salt reduction. Modular container sized technologies approved for farm applications.	https://www.yara.com/yara-clean-ammonia/	Yes	green fertilisers, green ammonia, green	
Copenhagen Infrastructure Partners (CIP)	Copenhagen Infrastructure Partners Asemette Plads 29	The company announced in 2022 the development of the first phase of Project Catalina in partnership with Enagás, Naturgy, Fertilisera and Vestas. It is a pioneering Copenhagen start-up on green ammonia production based on Lithium salt reduction. Modular container sized technologies approved for farm applications.	Link	Yes	green fertilisers, green ammonia, green	
Nitrofix Solutions	Denmark	Interested in green ammonia/they developed a green ammonia demonstration system in the UK	https://nitrofixsolutions.com/the-technology/	Yes	green ammonia, water solving	Met their team at NH3 Event in Rotterdam
Siemens UK	UK Orchard Road Royston SG8 5HE	UK R&D Facility supporting multiple global business units. Focused in the application of plasma technologies and catalysis.	paul.beale@siemens.com	Yes	green ammonia	Paul provided a supporting letter (to be a member of advisor board) for my RAEng grant application
Johnson Matthey Technology Centre	UK R&D Facility supporting multiple global business units. Focused in the application of plasma technologies and catalysis.	UK R&D Facility supporting multiple global business units. Focused in the application of plasma technologies and catalysis.	peter.hinde@matthey.com	No	Plasma catalysis	Peter Hinde from Johnson Matthey Technology Centre (UK) is happy to join our advisory board. He is the lead of their plasma catalysis team
CASALE SA	Switzerland	Interested in ammonia synthesis	Garbajo Alberto -A.Garbajo@casale.ch	Yes	Green ammonia, green bioammonia	
Switch2offshore company	Groothedekesbuige Stationsplein 45, unit A4.004 3013 AK Rotterdam The Netherlands Voor Nieuwmarkt Synergy Denmark A/S	Offshore green energy production - vision: to contribute to a sustainable world by production green hydrogen offshore at industrial scale. Once the technical and economic viability has been confirmed Switch2H2 will create a consortium of industry players, secure off takers and arrange funding for the full EPCI scope. We expect to be selling green H2 (or green ammonia) by 2028.	https://switch2offshore.com/	Yes, really interested in DARE2X	company working at the bigger scale, large project commercial	john.ristved@switch2offshore.com , Edoardo Furlan
Synergy Group	Key Fishers Plads 10 2300 Copenhagen S Denmark Tel: +45 21 44 29 89	Leading Global Ship Management Company	https://www.synergymarinegroup.com/	Yes		corporatecommunications@synergyship.com
Sunborne Systems	Sunborne Systems, The Lambourn, Wyndyke Furlong, Abingdon, Oxfordshire, OX14 1UJ London	technology is based on over a decade of research and development. Today, its capabilities range from the advanced thermal management necessary to make the real-time ammonia cracking practical, to the catalyst chemistry that makes it all possible.	https://sunbornesystems.com/	Yes		hello@sunbornesystems.com
Climate Council	Bedford House 69-79 Fulham High Street London, SW6 3JW Tel: +44 20 7384 8056	renewable energy community dedicated entirely towards the financing and scaling up of clean energy.	https://climatecouncil.com/	Yes		hjk.simpson@climatecouncil.com melanie.richards@climatecouncil.com
Maersk	DK	Shipping company who might want to replace their fleet with NH3 driven vessels instead. Right now they are experimenting with green methanol	Berit Hennemann, Head of Green Sourcing Strategy and Business Development at Maersk	No	shipping, green ammonia	Possible member of advisory board
H2SITE	Hydrogen Dnute, S.L. Camino Gogorrana 2 48180, Leku, Bizkaia - Spain	On-site high-quality hydrogen production systems. Hydrogen transport by different configurations: energy carriers + membrane reactor or hydrogen blend + membrane separator	https://www.h2site.eu/	Yes		https://www.h2site.eu/en/?page_contacto
InterContinental Energy	offices in Singapore, Perth, Dubai, and Muscat.	InterContinental Energy (ICE) is committed to delivering green hydrogen at scale to accelerate the energy transition.	https://intercontinentalenergy.com/	Yes		for press/media inquiries, please email: media@intercontinentalenergy.com for all other general inquiries, please email: info@intercontinentalenergy.com
ReMo	ReMo Energy, Inc. Boston, Massachusetts	ReMo is developing a fleet of distributed-scale ammonia plants that use renewable energy to make nitrogen fertilizers at prices competitive with those from the giant natural gas-fueled suppliers, optimizing the plant design for distributed scale and integration with an electrolyser. ReMo can build distributed plants using conventional components at far lower cost than conventional ammonia plant architectures	https://www.remo.energy/	Yes	ammonia production	info@remo.energy
UH2	Office at Seveden: Karl Nordströms väg 31 - 432 53, Valberg +46 76 313 75 61	UH2 specializes in green hydrogen and green ammonia energy solutions. Committed to a sustainable, reliable and affordable energy system, we work on solutions for green power production, distribution and storage. Able to provide the full project needs, UH2 strives to add value by implementing ongoing technologies and innovative solutions	https://uh2.eu/	Yes		info@uh2.eu
Tecnicas Reunidas	Parque Empresarial Adequa, Edificio 6 Avenida de Burgos, 89 28050 Madrid	engineering plants, Services to produce clean fuels that have a positive impact in the health of the communities. Services to produce petrochemical products, which are key for water distribution, food industry, improved efficiency in buildings and transport and health advancements among others. Services for the whole natural gas value chain, a key transition fuel for achieving a net zero-carbon energy supply. Services for the development of low carbon energy technologies, such as hydrogen, carbon capture and storage , bio energies and circular economy.	https://www.tecnicasreunidas.es/	Yes		tr@tecnicasreunidas.es Exclusive attention to the media comunicacionTR@tecnicasreunidas.es



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Figure 25: D&C questionnaires for partners – Industrial companies



Indicate any relevant company, industrial partner or association which could be crucial for the future upscale and exploitation of DARE2X. Associations are marked in blue. Please add any comment in the column G.

Name of the company/Organisation	Country and Headquarters	Possible synergies with DARE2X	Link to website	Have you contacted this company?	Keywords	Comments
Ammonia Energy Association (AEA)	Ammonia Energy Association 77 Sands Street, 6th Floor Brooklyn, NY 11201	They have an accessible large list of members that match the end-users stakeholders of DARE2X.	https://www.ammoenergy.org/about/	Yes	energy transition, decarbonization of ammonia	
Hydrogen Europe Association	Av. Tolison d'or 56-60, Brussels, Belgium	The main lines of work are developed in the policy field. *Interesting fact: in line with One of the main lines of work is energy efficiency. The IEA facilitates the exchange of knowledge through our training programs, workshops, and research collaborations.	https://hydrogeneurope.eu/	Yes	hydrogen	They expect to become member (membership fee)
International Energy Agency of hydrogen production (IEA)	9 rue de la Fédération Brussels, Belgium	Largest energy research community in Europe. It is a membership-based, non-profit association and brings together 250 universities and public research centres in 30 EUOP (Energy Technology Development and Demonstration Program) supports private companies and universities to develop and demonstrate new energy	IEA – International Energy Agency	Yes	hydrogen	
European Energy Research Alliance	Rue de Namur/Naamsestraat 72, 1000 Brussels, Belgium	EERA - European Energy Research Alliance (eera-set.eu)	https://ens.dk/en/our-responsibilities/research-	Yes		
Energy Technology Development and	Carsten Niebuhrs Gade 43 DK-1577 Copenhagen V	EUOP (Energy Technology Development and Demonstration Program) supports private companies and universities to develop and demonstrate new energy	https://ens.dk/en/our-responsibilities/research-	Yes		
MATERPLAT Plataforma Tecnológica Española de Materiales Avanzados y Nanomateriales,	C/ Eric Kandel, 2. Tecnogetafe	Accessible list of members, potentiate networking and B2B. Supporting with C&D of events or other news. Provide technical committees and participation.	https://materplat.org/	Yes, LOM association. Really interested in DARE2x		Really interested. Potential C&D can be foreseen
SUSCHEM Plataforma tecnológica Española de Química sostenible	c/ Hermosilla, 31. 28001 Madrid.91 431 79 64	Accessible list of members, potentiate networking and B2B. Supporting with C&D of events or other news. Provide technical committees and participation.	https://www.suschem-es.org/	Yes, LOM association.		
AEPIBAL	Oficinas Barcelona Gran Via de les Corts Catalanes, 774, 4º 08013 Barcelona	Accessible list of members, potentiate networking and B2B. Supporting with C&D of events or other news. Provide technical committees and participation.	https://aepibal.org/	Yes, LOM association.		
PTE-HPC Plataforma Tecnológica Española del Hidrógeno y de las Pilas de Combustible	RODOLFO ENRIQUETA Y MEDIOAMBIENTE, S.L. Ronda de Poniente 15, 1ª Int. Izda. 28760 Tres Cantos, Madrid	Accessible list of members, potentiate networking and B2B. Supporting with C&D of events or other news. Provide technical committees and participation.	https://www.ptehpc.org/	Yes, LOM association.		
International PTX Hub	c/o Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH Potsdamer Platz 10 10785 Berlin Germany	International PTX Hub work with our partners in the public and private sector to leverage these potentials: to start the transformation towards climate-neutral industries and economies now, everywhere, in parallel, and fast.	https://ptx-hub.org/	Yes	defossilised economy, energy transition	info@ptx-hub.org

Figure 26: D&C questionnaires for partners – Industrial associations



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ANNEX II: DETAILED STAKEHOLDER ANALYSIS MATRIX BY OBJECTIVE AND GEOGRAPHIC LEVEL

Objective 1: Increase general project awareness				
At Local (in your locality), National (in your country) & European (in other EU countries) levels				
Stakeholder	Stakeholder interest in the project	Assessment of impact	Relative prioritisation	Potential Strategies for Obtaining Support or Reducing Obstacles
List all the experts in the field that may affect or be affected by the DARE2X project directly and indirectly	Analyse: <ul style="list-style-type: none"> How does DARE2X technology concern them? How are the issues addressed by DARE2X relevant to their priorities? What is the DARE2X benefit (s) to them? What aspects of DARE2X might cause conflict for them? 	Analyse: <ul style="list-style-type: none"> How important are the experts' interests to the success of DARE2X? The role the experts in the field must play for DARE2X to be successful, and the likelihood that these experts will play this role. 	Analyse: <ul style="list-style-type: none"> How important is it to involve the stakeholder in DARE2X? 	Think of how you might approach each of the experts, i.e.: <ul style="list-style-type: none"> What motivates them? What kind of information will they need? What are their expectations from you and DARE2X?
List all the science magazines that may affect or be affected by the	Analyse: <ul style="list-style-type: none"> How does DARE2X technology concern them? 	Analyse:	Analyse: <p>How important is it to involve them in DARE2X?</p>	Think of how you might approach each of these European research groups, i.e.:



DARE2X project directly and indirectly	<ul style="list-style-type: none"> How are the issues addressed by DARE2X relevant to their priorities? What is the DARE2X benefit (s) to them? What aspects of DARE2X might cause conflict for them? 	<ul style="list-style-type: none"> How important are the experts' interests to the success of DARE2X? <p>The role the research groups must play for DARE2X to be successful, and the likelihood that these research group will play this role.</p>		<ul style="list-style-type: none"> What motivates them? What kind of information will they need? <p>What are their expectations from you and DARE2X?</p>
Local Level = in your locality				
Stakeholder	Stakeholder interest in the project	Assessment of impact	Relative prioritisation	Potential Strategies for Obtaining Support or Reducing Obstacles
List all the groups that form the relevant general public for DARE2X (age groups? Backgrounds? socioeconomic statuses? Neighbouring communities to DARE2X reactors...) that may affect or be affected by DARE2X directly and indirectly	<p>Analyse:</p> <ul style="list-style-type: none"> How does DARE2X technology concern them? How are the issues addressed by DARE2X relevant to their priorities? What is the DARE2X benefit (s) to them? What aspects of DARE2X might cause conflict for them? 	<p>Analyse:</p> <ul style="list-style-type: none"> How important are the GENERAL PUBLIC interests to the success of DARE2X? The role the GENERAL PUBLIC, or a specific group (s) from the general public, must play for DARE2X to be successful, and the likelihood that this GENERAL PUBLIC will play this role. 	<p>Analyse:</p> <p>How important is it to involve the GENERAL PUBLIC or a specific group of the GENERAL PUBLIC in DARE2X?</p>	<p>Think of how you might approach these local/national TV channels, i.e.:</p> <ul style="list-style-type: none"> What motivates them? What kind of information will they need? What are their expectations from you and DARE2X?



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<p>List all the local media (TV channels, RADIO, NEWSPAPERS) that may affect or be affected by the DARE2X project directly and indirectly</p>	<p>Analyse:</p> <ul style="list-style-type: none"> • How does DARE2X technology concern them? • How are the issues addressed by DARE2X relevant to their priorities? • What is the DARE2X benefit (s) to them? • What aspects of DARE2X might cause conflict for them? 	<p>Analyse:</p> <ul style="list-style-type: none"> • How important are these local media interests to the success of DARE2X? • The role these local media must play for DARE2X to be successful, and the likelihood that these local media will play this role. 	<p>Analyse:</p> <p>How important is it to involve these local channels in DARE2X?</p>	<p>Think of how you might approach each of these local media, i.e.:</p> <ul style="list-style-type: none"> • What motivates them? • What kind of information will they need? • What are their expectations from you and DARE2X?
<p>List all the secondary schools in your locality that may be interested to learn about H₂ energy and climate change.</p>	<p>Analyse:</p> <ul style="list-style-type: none"> • How a project like DARE2X concerns them? • How are the issues addressed by DARE2X relevant to their priorities? • What is the DARE2X benefit (s) to them? • What aspects of DARE2X might cause conflict for them? 	<p>Analyse:</p> <ul style="list-style-type: none"> • How important are these secondary schools interests to the success of DARE2X? • The role these secondary schools must play for DARE2X to be successful, and the likelihood that these secondary schools will play this role. 	<p>Analyse:</p> <p>How important is it to involve these secondary schools in DARE2X?</p>	<p>Think of how you might approach these secondary schools, i.e.:</p> <ul style="list-style-type: none"> • What motivates them to learn about H₂energy, climate change and DARE2X? • What kind of information will they need? • What are their expectations from you and DARE2X?



<p>List here any other stakeholder(s) we didn't include, that we want to reach to or include.</p>	<p>Analyse:</p> <ul style="list-style-type: none"> • How does DARE2X technology concern them? • How are the issues addressed by DARE2X relevant to their priorities? • What is the DARE2X benefit (s) to them? <p>What aspects of DARE2X might cause conflict for them?</p>	<p>Analyse:</p> <ul style="list-style-type: none"> • How important are the GENERAL PUBLIC interests to the success of DARE2X? <p>The role the GENERAL PUBLIC, or a specific group (s) from the general public, must play for DARE2X to be successful, and the likelihood that this GENERAL PUBLIC will play this role.</p>	<p>Analyse:</p> <p>How important is it to involve the GENERAL PUBLIC or a specific group of the GENERAL PUBLIC in DARE2X?</p>	<p>Think of how you might approach these local/national TV channels, i.e.:</p> <ul style="list-style-type: none"> • What motivates them? • What kind of information will they need? <p>What are their expectations from you and DARE2X?</p>
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OBJECTIVE 2: Share project knowledge and research outputs

European Levels = in other EU countries

Stakeholder	Stakeholder interest in the project	Assessment of impact	Relative prioritisation	Potential Strategies for Obtaining Support or Reducing Obstacles
<p>List all the European research groups in the fields of: CRM-free catalysts & sorption materials, carbon-free fuels, energy storage; transport... that may affect or be affected by the</p>	<p>Analyse:</p> <ul style="list-style-type: none"> • How does DARE2X technology concern them? • How are the issues addressed by DARE2X relevant to their priorities? 	<p>Analyse:</p> <ul style="list-style-type: none"> • How important are the experts' interests to the success of DARE2X? • The role the research groups must play for DARE2X to be successful, and the likelihood 	<p>Analyse:</p> <ul style="list-style-type: none"> • How important is it to involve them in DARE2X? 	<p>Think of how you might approach each of these European research groups, i.e.:</p> <ul style="list-style-type: none"> • What motivates them? • What kind of information will they need? • What are their expectations from you and DARE2X?



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DARE2X project directly and indirectly	<ul style="list-style-type: none"> What is the DARE2X benefit (s) to them? What aspects of DARE2X might cause conflict for them? 	that these research group will play this role.		
Graduate students & Early-stage researchers (young students and researchers to continue investigating and improving the DARE2X concept)				
Specialised media/Journals & Industrial Journals?				
OBJECTIVE 4: Inform the potential supporters				
Local (in your locality), national (in your country) and at EU level (EU institutions, EU Policy networks, etc.)				
Stakeholder	Stakeholder interest in the project	Assessment of impact	Relative prioritisation	Potential Strategies for Obtaining Support or Reducing Obstacles
List all policy makers that will affect or be affected by DARE2X directly and indirectly	Analyse: <ul style="list-style-type: none"> How does DARE2X technology concern them? 	Analyse: <ul style="list-style-type: none"> How important are the policy makers' interests to the success of DARE2X? 	Analyse: <p>How important is it to involve each of these policy makers in DARE2X?</p>	Think of how you might approach each of these policy makers, i.e.: <ul style="list-style-type: none"> What motivates them? What kind of information will they need?



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	<ul style="list-style-type: none"> • How are the issues addressed by DARE2X relevant to their priorities? • What is the DARE2X benefit (s) to them? • What aspects of DARE2X might cause conflict for them? • What is their attitude towards what you might be trying to do; are they hostile, cooperative, unsure...? • What aspects of DARE2X might cause conflict for the stakeholder? 	<ul style="list-style-type: none"> • The role the policy makers must play for DARE2X to be successful, and the likelihood that these policy makers will play this role. 		<ul style="list-style-type: none"> • What are their expectations from you and DARE2X?
List all standardisation bodies that will affect or be affected by DARE2X directly and indirectly	<p>Analyse:</p> <ul style="list-style-type: none"> • How does DARE2X technology concern them? • How are the issues addressed by DARE2X relevant to their priorities? • What is the DARE2X benefit (s) to them? 	<p>Analyse:</p> <ul style="list-style-type: none"> • How important are the standardisation bodies interests to the success of DARE2X? • The role the standardisation must play for DARE2X to be successful, and the likelihood that these standardisation bodies will play this role. 	<p>Analyse:</p> <p>How important is it to involve each of these standardisation bodies in DARE2X?</p>	<p>Think of how you might approach each of these standardisation bodies, i.e.:</p> <ul style="list-style-type: none"> • What motivates them? • What kind of information will they need? • What are their expectations from you and DARE2X?

	<ul style="list-style-type: none"> • What aspects of DARE2X might cause conflict for them? • What is their attitude towards what you might be trying to do; are they hostile, cooperative, unsure...? • What aspects of DARE2X might cause conflict for the stakeholder? 			
<p>List all social actors (civil society, environmental agencies, neighbouring communities of reactors, etc.) that will affect or be affected by DARE2X directly and indirectly</p>	<p>Analyse:</p> <ul style="list-style-type: none"> • How does DARE2X technology concern them? • How are the issues addressed by DARE2X relevant to their priorities? • What is the DARE2X benefit (s) to them? • What aspects of DARE2X might cause conflict for them? • What is their attitude towards what you might be trying to do; are they hostile, cooperative, unsure...? • What aspects of DARE2X might cause conflict for the stakeholder? 	<p>Analyse:</p> <ul style="list-style-type: none"> • How important are the standardisation bodies interests to the success of DARE2X? • The role the standardisation must play for DARE2X to be successful, and the likelihood that these standardisation bodies will play this role. 	<p>Analyse:</p> <p>How important is it to involve each of these standardisation bodies in DARE2X?</p>	<p>Think of how you might approach each of these standardisation bodies, i.e.:</p> <ul style="list-style-type: none"> • What motivates them? • What kind of information will they need? • What are their expectations from you and DARE2X?