Ref. Ares(2026)6820391 - 08/07/2026

Funded by the European Union

**ANDREAH**

**AMMONIA BASED MEMBRANE REACTOR FOR GREEN HYDROGEN PRODUCTION**

**HORIZON EUROPE GRANT AGREEMENT NUMBER: 101112118**

**Start date of project: 01/07/2023** **Duration: 4 years**

# WP6 – Dissemination and Communication

# D6.8
# ANDREAH dissemination activities M36 (including training, visit demo, etc)

**Topic:** HORIZON-JTI-CLEANH2-2022-02-04
**Funding scheme:** Research and innovation actions
**Call identifier:** HORIZON-JTI-CLEANH2-2022-2

| Due date of deliverable: | Actual submission date: | Reference period: |
|---|---|---|
| 30-06-2026 | 08-07-2026 | 01-01-2025 – 30-06-2026 |
| Document classification code (*): ANDREAH-WP6-D68-DLR-TUE-08072026-final.pdf | | Prepared by (**): TU/e |

| Version | DATE | Changes | CHECKED | APPROVED |
|---|---|---|---|---|
| v01 | 02/07/2026 | First Release | 1CUBE | S.Scoppa |
| V02 | 06/07/2026 | Second release | TECNALIA | J.Ollo |
| V03 | 07/07/2026 | Third Release | 1CUBE | S.Scoppa |
| | | | | |
| | | | | |

**Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or Clean Hydrogen Joint Undertaking. Neither the European Union nor the granting authority can be held responsible for them.**

| Dissemination Level | | |
|---|---|---|
| **PU** | Public | X |
| **SEN** | Sensitive, limited under the conditions of the Grant Agreement | |

*(*) for generating such code please refer to the Quality Management Plan, also to be included in the header of the following pages*

*(**) indicate the acronym of the partner that prepared the document*

## Content

***1. EXECUTIVE SUMMARY*** ..... ***3***

1.1. Description of the deliverable content and purpose ..... 3

***2. Background of the Project*** ..... ***4***

2.1. Scientific and technological targets ..... 4

2.2. Project Structure and Plan ..... 4

***3. Dissemination and Communication phases*** ..... ***8***

3.1. Dissemination and Communication tools ..... 8

3.1.1. ANDREAH visual identity ..... 9

3.1.2. ANDREAH videos ..... 9

3.1.3. ANDREAH Flyer/banners/posters ..... 14

3.1.4. Other printed materials ..... 15

3.1.5. Project website ..... 16

3.1.6. Social Media ..... 17

3.1.7. Newsletters and Press Release ..... 18

3.1.8. Scientific publications ..... 18

3.1.9. No scientific articles ..... 18

3.1.10. Posters and presentations: ..... 19

3.1.11. Liaison / collaboration with relevant projects ..... 22

***4. CONCLUSIONS*** ..... ***22***

***5. ANNEXES*** ..... ***23***

# 1. EXECUTIVE SUMMARY

## 1.1. Description of the deliverable content and purpose

The role of dissemination and communication in the ANDREAH project is crucial. These activities play a key role in sharing scientific knowledge and technological advancements with a wide audience. The goal is not only to boost the project's visibility and that of its partners but also to ensure proper recognition and future opportunities for implementation.

To maximize impact, these efforts are directed at key European forums and platforms that align with the project's theme. By targeting the right audience, the ANDREAH project enhances its reach and influence.

This document outlines the various dissemination and communication activities carried out in the ANDREAH project by Month 36. These initiatives align with the Dissemination and Communication Plan detailed in Deliverables D6.3, D6.5, D6.6 and D6.7.

For the first and second years of the project, the focus is on:

1. Implementing Dissemination and Communication Strategies
    - Developing external and internal communication tools.
    - Creating both public and private websites.
    - Producing project-related communication materials.
2. Conducting Internal and External Dissemination Activities
    - Strengthening collaboration among Work Packages (WPs).
    - Building a strong network among all project participants.
    - Maintaining and regularly updating the project website.
3. Presenting at International Events and Scientific Forums
    - Showcasing public deliverables.
    - Participating in global conferences and workshops.
    - Engaging in scientific discussions through webinars and academic schools.

As ANDREAH project enters in the third and fourth years of the project, the focus is on:

1. Maximising Dissemination and Communication Impact
    - Promoting the project's key achievements and final results to target audiences.
    - Updating and expanding communication materials to reflect project progress and outcomes.
    - Ensuring continuous engagement through the project website, social media, newsletters, and other communication channels.
2. Strengthening Exploitation, Stakeholder Engagement, and Sustainability
    - Supporting the uptake and exploitation of project results by relevant stakeholders.
    - Expanding collaboration with external networks, policymakers, industry, and the scientific community.
    - Developing sustainability strategies to ensure the long-term use and impact of project outcomes beyond the project's lifetime.
3. Disseminating Final Results at International Events and Scientific Forums

- Presenting the project's final achievements, methodologies, and innovations at international conferences, workshops, and scientific meetings.
- Publishing scientific papers, policy briefs, and other project outputs.
- Organising final dissemination events and webinars to share lessons learned, best practices, and recommendations with the wider community.

By maintaining a structured approach to communication, the ANDREAH project ensures effective knowledge sharing and long-term impact.

## 2. Background of the Project

ANDREAH's main objective is to provide a quantum leap in the development of advanced $NH_3$ cracking to produce ultra-pure $H_2$ (>99.998%) by developing an innovative system, based on a Catalytic Membrane Reactor (CMR) for the cracking of Ammonia, positioning Europe as a reference in this field and significantly promoting the deployment of the hydrogen economy in the EU. In this way, optimised heat management, improved conversion per pass and purification/recycling for more cost-efficient and resource-effective ammonia decomposition at lower temperatures (400-450 °C) will be achieved.

The development of new catalysts and carbon membranes integrated into CRM will provide huge process intensification enabling the distributed generation of $H_2$ from $NH_3$ as long-term storage and energy carrier for long distances transportation and thus, new associated business opportunities will emerge, e.g. for use in hydrogen refuelling stations or as backup for refineries or steel industries, where it is more efficient to store hydrogen in the form of ammonia and to operate a cracking system for the production of the required $H_2$.

As a result of the preliminary business case, a cumulative direct job creation during the period (2032-2037) of more than 500 new jobs and an indirect and induced job creation of more than 3000 new jobs have been obtained. In the long term, the project will allow creation of more than 25000 new jobs.

### 2.1. Scientific and technological targets

ANDREAH is divided in the following specific targets:

1. To develop and demonstrate at 10$kg_{H2}$/day scale, a new Intensified ammonia cracking system based on Catalytic membrane Reactor Technology through advanced Carbon Molecular Sieve Membranes integrated with Novel Catalyst.
   - To develop an innovative, environmentally friendly and with less critical materials, structured catalyst that can be used at much lower temperatures compared to state-of-the-art process.
   - To develop innovative membranes for selective separation of $H_2$ during production process.
   - To develop novel sorbents for polishing the $H_2$ recovered by the membranes.

2. To develop a full LCA, LCC and Health and Safety Analysis (HSE) of ANDREAH

3. To pave the way for future exploitation of ANDREAH Key Exploitable results.

4. To promote the dissemination and communication of ANDREAH's results and expand its impact.

### 2.2. Project Structure and Plan

**ANDREAH: A Three-Phase Approach to Technology Validation**

The ANDREAH project is structured around three distinct phases, ensuring a seamless and well-structured transition from the current stage of technology development to a validated system at Technology Readiness Level 5 (TRL5). This phased approach allows for a systematic progression, minimizing risks while maximizing efficiency in scaling up the proposed solutions.

As illustrated in Figure 1, the ANDREAH methodology follows a logical progression, starting with upstream research and development (R&D) activities, moving through the selection and refinement of the final prototype, and culminating in the validation of the primary technology. During the final phase, the key performance indicators (KPIs) for hydrogen ($H_2$) production from ammonia ($NH_3$) will be thoroughly analyzed to ensure optimal performance and viability.

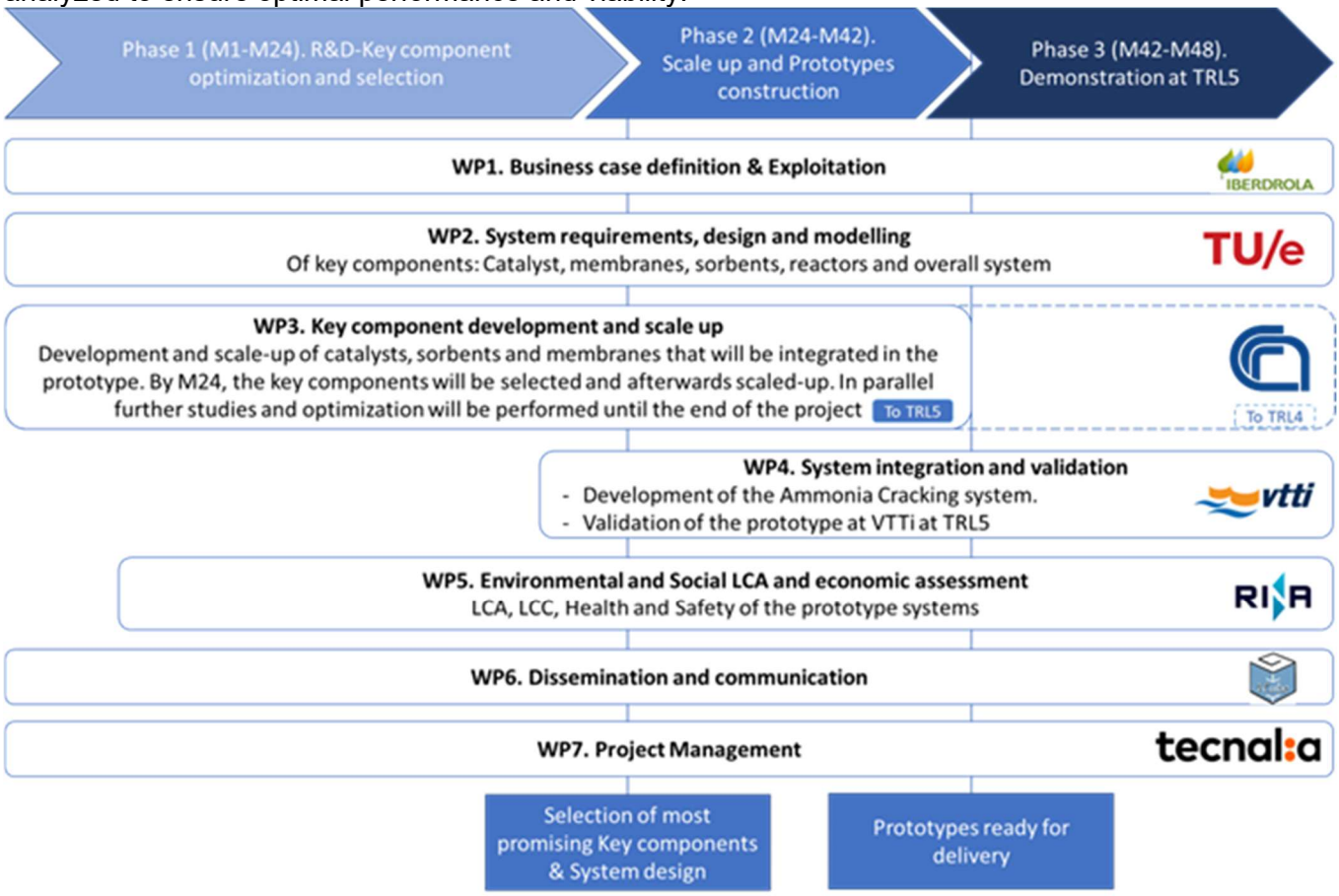



**Figure 1. ANDREAH methodology and validation action.**

### Phase 1 – Research & Development (M1-M24)

The first phase, spanning from Month 1 to Month 24, is led by universities, research and technology organizations (RTOs), and industrial partners. This phase primarily focuses on optimizing the key technological components, including:

- Membranes (developed by TEC)
- Catalysts (developed by CNR and UMI)
- Ammonia sorbents and reactors (developed by TUE)

Most of the experimental work during this stage will take place at laboratory or small-scale settings, allowing for controlled testing and iterative improvements. The research efforts in this phase will go beyond the current state-of-the-art by systematically refining each key component to enhance performance, efficiency, and scalability.

To streamline and enhance the R&D activities, this phase is structured into three interconnected pillars:

#### Pillar 1: Computational Modeling and Simulation

The first step involves advanced modeling and simulation activities, conducted by TUE. These computational tools will guide R&D teams in identifying the optimal combination of catalysts, sorbents, reactors, and membranes. By leveraging simulation-driven insights, experimental efforts will be focused on the most promising configurations, reducing trial-and-error iterations and improving efficiency.

**Pillar 2: Experimental Validation of Individual Components**
In this stage, researchers will conduct experiments using well-established $H_2$ and $NH_3$ processes. The goal is to first validate the computational models by comparing theoretical predictions with real-world experimental results. This step ensures that the models accurately reflect physical and chemical behaviors, providing a solid foundation for further development.

**Pillar 3: Integrated System Testing and Optimization**
The final stage of Phase 1 focuses on combining different components into an integrated system. This involves performing complex experiments that integrate membranes, catalysts, sorbents, and reactors based on the knowledge gained from Pillars 1 and 2. As part of this approach, a Design of Experiment (DoE) methodology will be employed to identify the optimal combination of parameters and processing routes. This systematic approach significantly reduces the number of experimental iterations required to reach the best-performing configuration, thereby saving both time and resources.

*Key Outcomes of Phase 1:*
The ultimate goal of Phase 1 is to select the most effective key components for scaling up in Phase 2. However, beyond this immediate objective, additional R&D efforts will also be dedicated to exploring alternative solutions for components at lower TRL levels (up to TRL4). These parallel investigations will provide valuable insights into potential future advancements and backup strategies, ensuring the long-term success of the ANDREAH project.

By structuring the R&D process in a phased and systematic manner, ANDREAH ensures a highly efficient transition from laboratory-scale research to real-world applications, paving the way for a more sustainable and effective hydrogen production technology.

**Phase 2 – Scale up of key Components and construction of prototypes (M24-M42)**
The second phase, spanning from Month 25 to Month 48, focuses on translating the results of Phase 1 into a larger-scale integrated prototype. Following the optimization and selection of the most promising technological components, the project shifts from laboratory-scale validation towards component scale-up, system integration, and prototype demonstration under representative operating conditions. This phase is primarily led by industrial partners, with strong support from research organizations and universities to ensure seamless integration and performance optimization.

The selected catalysts will be scaled up by UMICORE, while TEC will manufacture and supply the membranes required for the ammonia decomposition membrane reactor developed by TUE. Building on the knowledge generated during Phase 1, the partners will leverage their extensive expertise in catalyst and membrane manufacturing to increase not only the Technology Readiness Level (TRL) of the individual components but also their Manufacturing Readiness Level (MRL), ensuring that the technologies are suitable for future industrial implementation. In parallel, TUE will procure and assemble all additional components required for the prototype, including the Balance of Plant (BoP), instrumentation, control systems, and testing equipment.

To ensure an efficient transition from component development to system demonstration, Phase 2 is organized into three interconnected pillars.

**Pillar 1: Component Scale-up and Manufacturing Readiness**

The first stage focuses on scaling up the key components selected in Phase 1. UMICORE will manufacture catalysts at the required scale while TEC will produce membrane modules compatible with the prototype reactor. Throughout this process, manufacturing routes will be optimized to ensure reproducibility, quality, and scalability. These activities will significantly increase both the TRL and MRL of the critical technologies, bringing them closer to commercial deployment.

**Pillar 2: Prototype Assembly and System Integration**

Once the scaled-up components become available, TUE will assemble the complete ammonia decomposition prototype. This includes integrating the membrane reactor with the Balance of Plant, gas handling systems, instrumentation, sensors, control architecture, safety systems, and auxiliary equipment. Particular attention will be devoted to ensuring the compatibility of all subsystems, reliable operation under realistic conditions, and straightforward maintenance and operability.

**Pillar 3: Prototype Validation and Performance Demonstration**

The final stage of Phase 2 focuses on the experimental validation of the fully integrated prototype. Comprehensive testing campaigns will be conducted to evaluate hydrogen production efficiency, ammonia conversion, hydrogen purity, membrane performance, catalyst stability, system reliability, and overall energy efficiency. The experimental results will be compared with the models developed in Phase 1, allowing further refinement of the predictive tools and confirming the scalability of the technology. The validation activities will also provide the technical data required for techno-economic assessment, life-cycle analysis, and future industrial exploitation.

**Key Outcomes of Phase 2**

The main objective of Phase 2 is to demonstrate the ANDREAH technology at prototype scale, significantly increasing its Technology Readiness Level while simultaneously advancing the Manufacturing Readiness Level of its key components. By successfully integrating scaled-up catalysts, membranes, reactors, and auxiliary systems into a fully operational prototype, the project will validate the feasibility of the proposed ammonia-to-hydrogen technology under representative operating conditions.

Beyond demonstrating technical performance, Phase 2 will generate valuable manufacturing know-how, operational experience, and system-level data that will support future pilot-scale demonstrations and commercial deployment. This systematic scale-up approach ensures that the technologies developed within ANDREAH are not only scientifically validated but are also manufactured and integrated in a manner compatible with future industrial implementation.

## 3. Dissemination and Communication phases

The ANDREAH project aims to attain TRL5 by the project's conclusion. Given the project's moderate Technology Readiness Level (TRL), it becomes feasible to delineate communication and dissemination activities across various developmental stages of the technologies.

A closer examination of the ANDREAH methodology, depicted in the Figure 1, reveals a structured division into three interconnected phases: Phase 1 involves Research and Development (M1-M24), Phase 2 encompasses the Scale-up of Key Components and the construction of prototypes (M24-M40), and Phase 3 focuses on the Validation of prototypes (M36-M48).

Coherently with the project phases, the Dissemination and communication (and exploitation as well) will be structured in three different phases. These phases are described as:

- Phase 1 involves an Awareness phase, aiming to heighten awareness within a qualified community/stakeholder and the public regarding the project and its objectives.

- In Phase 2, termed the Results phase, the focus shifts to promoting the project's outcomes, ensuring that potentially interested parties are informed about the achievements and associated benefits.

- Moving to Phase 3, known as the Validation phase, specific activities are undertaken to facilitate the exploitation of the results.

### 3.1. Dissemination and Communication tools

The ANDREAH project has identified and will exploit the following dissemination channels/tools as already optimized in other projects in the same energy and chemicals areas:

**Table 1. Summary of the dissemination channels/tools in ANDREAH.**

| Means / channel | Objective, target and quantifiable indicators |
|---|---|
| Project technical e-publication | A project e-publication will be produced during the second phase of the project to collect relevant results in the form of data and observations from the validation site and from Business simulation activities, thus giving comprehensive evidence of the advantages of the developed enabling technologies and of the concept as a whole.<br>Technical project e-publication downloads: <35 = poor; 35-70 = good; >70 = excellent |
| Scientific/technical publications and oral/poster presentations at conferences, symposia, seminars, workshops, etc. | The project's results will be published in the international scientific/technical literature, such as Energy, Membranes, JMS, Chemical Engineering Journal, Applied Energy, Journal of Power Engineering, ASME and ELSEVIER journals as well as in relevant scientific/technical literature at national level mainly in the member states where the partners are established, Results will also be presented at relevant conferences, symposia, seminars, workshops, and other events, such as the ICCMR17 (in 2025 in China, the main conference on membrane reactors), DHC+ Annual Congress, Sustainable Places, SSPCR conferences etc., either through oral or poster presentations. The project will furthermore promote its results at the national level in the various Member States of the partners. The highest impact open access journals within the relevant sector will be identified.<br>❖ At least 8 papers will be published on Open Research Europe OA platform.<br>❖ All publications will be collected in a dedicated space within the project website for open access/download. Open Access to peer-reviewed scientific publications will be provided.<br>❖ Number of papers submitted: <8 = poor, 8-10 = good, >10 = excellent |

| | |
|---|---|
| | ❖ Number of conference presentations: <6 = poor, 6-8 = good, >8 = excellent |
| Education sessions | Education sessions integrating the knowledge developed within the project will be offered at local as well as international level to students (undergraduate and postgraduate) and researchers in high level MSc and postgraduate courses in TUE, thanks to the presence in the consortium of researchers and professors from these institutions and already established collaboration<br>❖ At least 1 seminar/workshop year about hydrogen storages and material at TUE<br>❖ At least 2 PhD specific programmes at TUE, and Tecnalia |
| Liaison with EU communities | The consortium will seek liaison with most relevant EU communities on ANDREAH topics, including the relevant EU Technology Platforms (ETPs) such as Hydrogen Europe |
| Liaison / collaboration with relevant projects | The consortium will seek liaison and collaboration with other hydrogen HE projects that could complement project activities and provide synergies, also to effectively disseminate project results |

### 3.1.1. ANDREAH visual identity

The ANDREAH project logo, crafted by 1CUBE within the inaugural month of the project, is linked to the project acronym, with a pronounced emphasis on the ammonia and hydrogen components of the project

**Figure 2. ANDREAH Project Logo.**

Following the creation and selection of the project logo, the development of the ANDREAH project identity ensued, marked by the creation of various templates. These templates, tailored specifically for the ANDREAH project, encompass a PowerPoint presentation template, a Deliverable's template (such as the one employed for this particular deliverable), a Meeting Agenda template, Meeting Minutes template, and a versatile template suitable for any internal documents (derived from the deliverable template).

These project templates have been distributed to all consortium members through email and are conveniently stored on the internal site of ANDREAH (maintained by Tecnalia in the TEAMS environment). Accompanying documentation elucidating the utilization of these templates has also been made accessible to ensure seamless integration into project communications and documentation.

### 3.1.2. ANDREAH videos

The first video of ANDREAH project has been produced by 1CUBE at month 6 and has been corrected and improved after checking of partners and coordinator.

The video is available here
https://www.youtube.com/watch?v=E7T_goSZjLU

The video, 2.10 minutes long, is made with a combination of general footages, videos based on the ANDREAH proposal and video shooting taken at the labs of Eindhoven University of Technology.

Below a few pictures from the video

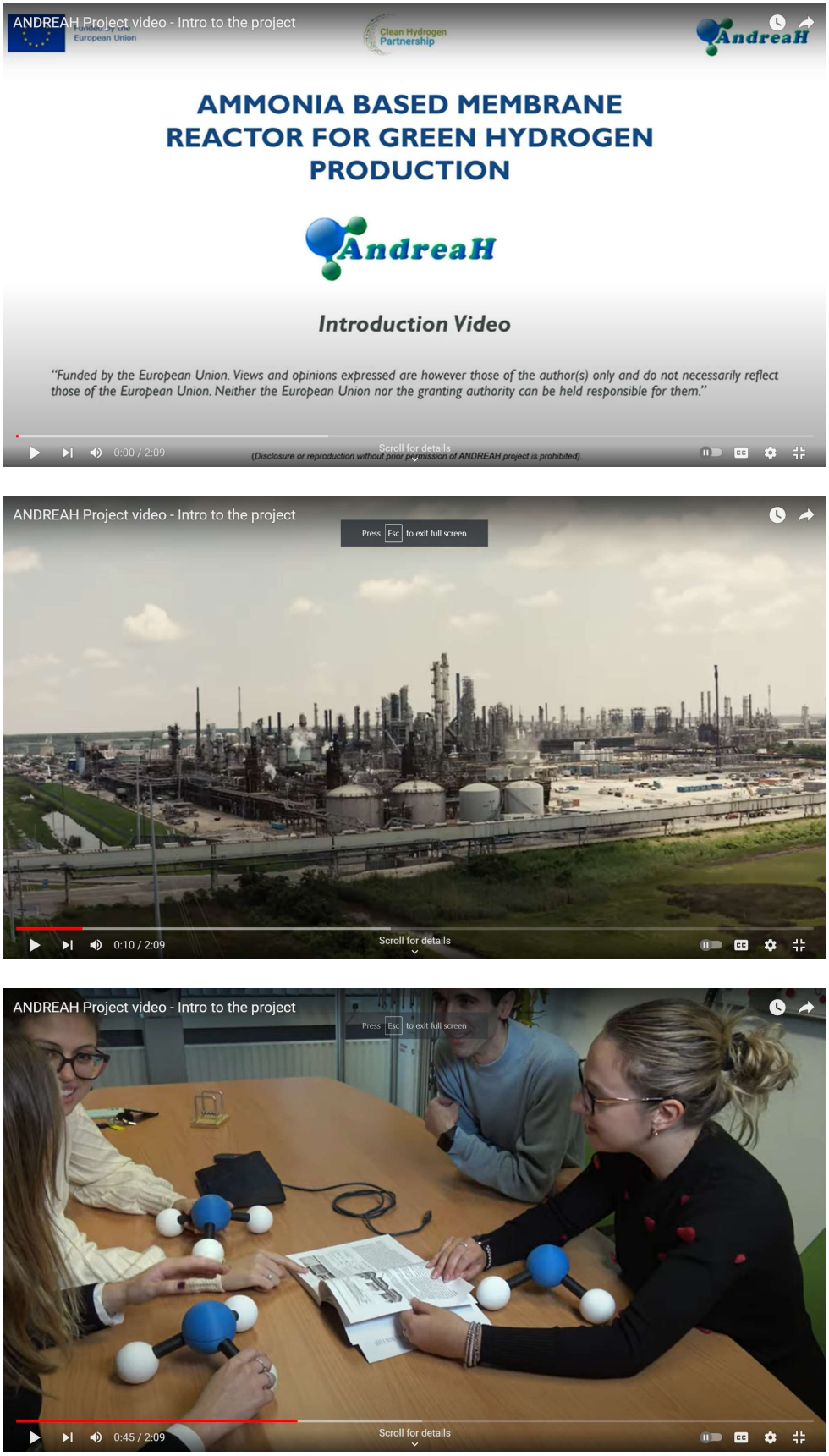



**Figure 3. Pictures from the first video of ANDREAH.**

A second short video has been created to disseminate the project on Linkedin. The video is available at https://www.youtube.com/watch?v=j4M63xthDGs




**Figure 4. Picture from the second video of ANDREAH.**

Other dissemination videos have been created by 1CUBE during M18-M36, related to the event that 1CUBE has organized and they have been uploaded at this page https://www.andreahproject.eu/articles-papers/

- Winter school 2025 where partners from CNR-ITAE and TECNALIA participated.

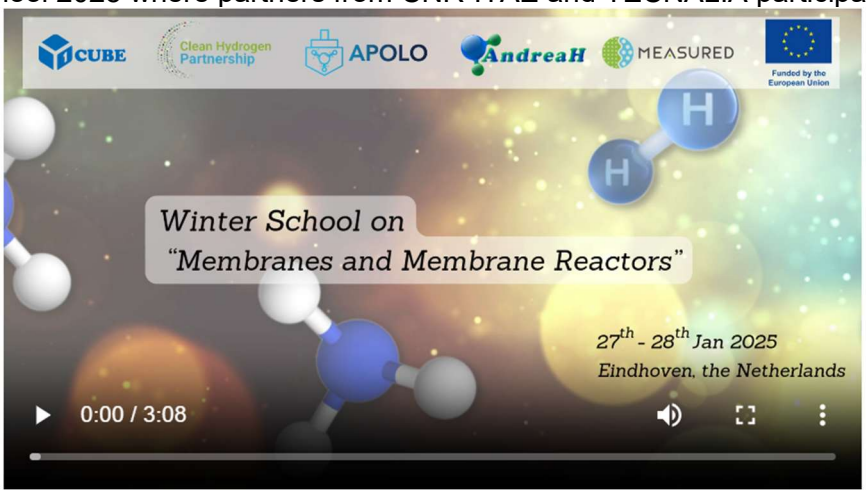



**Figure 5. Screenshot of the video on the website**

- In May 2025, 1CUBE organized a TEENTECH2 for teenagers in collaboration with AMBHER and APOLO projects, where young students have been introduced to cutting-edge scientific research and innovation through hands-on activities and engaging presentations.

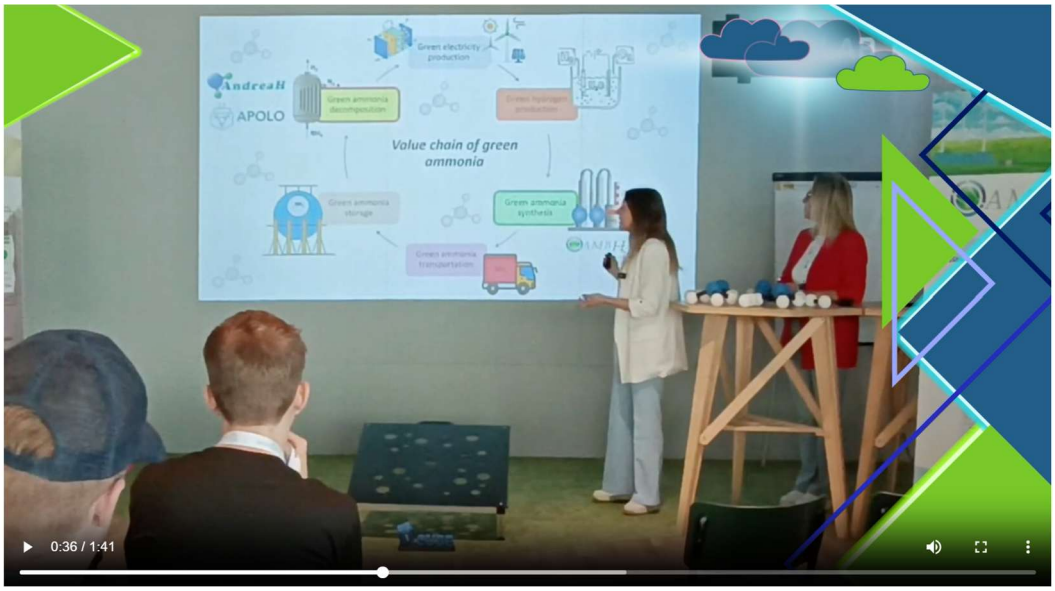



**Figure 6. Screenshot of the video**

- In 2025, two Virtual Tech Forum have been organized with the collaborations of other EU projects: AMBHER, APOLO and MemCat. The first Virtual Tech Forum focused on “Catalysts and Green Fuel”, while the second one on “Hydrogen as Green Energy”

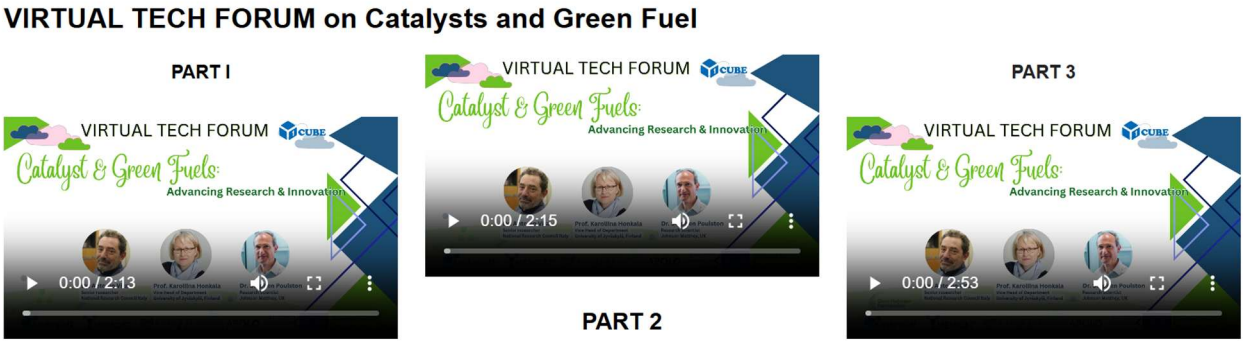



**Figure 7. Screenshot of the three sub-videos**

VIRTUAL Tech Forum: "Hydrogen as Green Energy"




**Figure 8. Screenshot of the second Virtual Tech Forum available also in You-Tube Channel**

- In September 2025, CNR-ITAE made a video abut TPMS Gyroid Catalyst preparation at their facilities. Video available by following the below link: https://www.andreahproject.eu/2025/09/17/video-from-cnr-itae/




**Figure 9. Screenshot of the video by CNR-ITAE**

- In March 2026, 1CUBE participated at the 10th International Women's Day in Eindhoven. A short video of our coordinator has been presented within ANDREAH as inspiration for other women in leading the project and to emphasize the importance of sustainability.




**Figure 10. Screenshot of the video**

- In June 2026, ANDREAH project participated at the event TEENTECH2 Day in Italy with other 4 Eu projects: AMBHER, APOLO, MemCat and EXBRINER.




**Figure 11. Screenshot video TEENTECH2 Day available also in [You-Tube Channel]**

### 3.1.3. ANDREAH Flyer/banners/posters

Different flyers, posters and banners will be created by 1CUBE in coordination with the partners to advertise ANDREAH in different events. The material will be custom made per event, while some general materials will be also created and printed that can be used in every dissemination event. A first poster has been created to advertise the start of ANDREAH at the international conference on membrane reactor held in San Sebastian in October 2023 (see image below).




**Figure 12. First poster presented in San Sebastian at ICCMR16.**

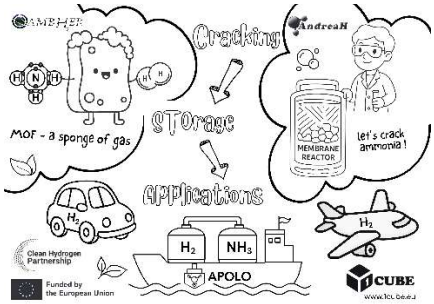
Several other posters and presentations are available in the website at

https://www.andreahproject.eu/dissemination/

### 3.1.4. Other printed materials

To support outreach and public engagement activities, 1CUBE developed a word search game, a colouring sheet, and a printed Cluster flyer, all incorporating the project's visual identity.
These materials were designed to communicate the project's key messages in an accessible and engaging way for different audiences, with a particular focus on children and families.

The materials were successfully used during different events, such as the International Women's Day and TEENTECH2 initiatives, contributing to increased project visibility, encouraging active participation, and fostering awareness of energy technologies among a wider audience.









### 3.1.5. Project website

The ANDREAH project website has been developed according to schedule. The project website is accessible at https://www.andreahproject.eu/ and will be maintained by 1CUBE for at least 5 years after the conclusion of the project. Afterwards it will be incorporated as section within 1Cube website.

An impression of the project is in the picture below.

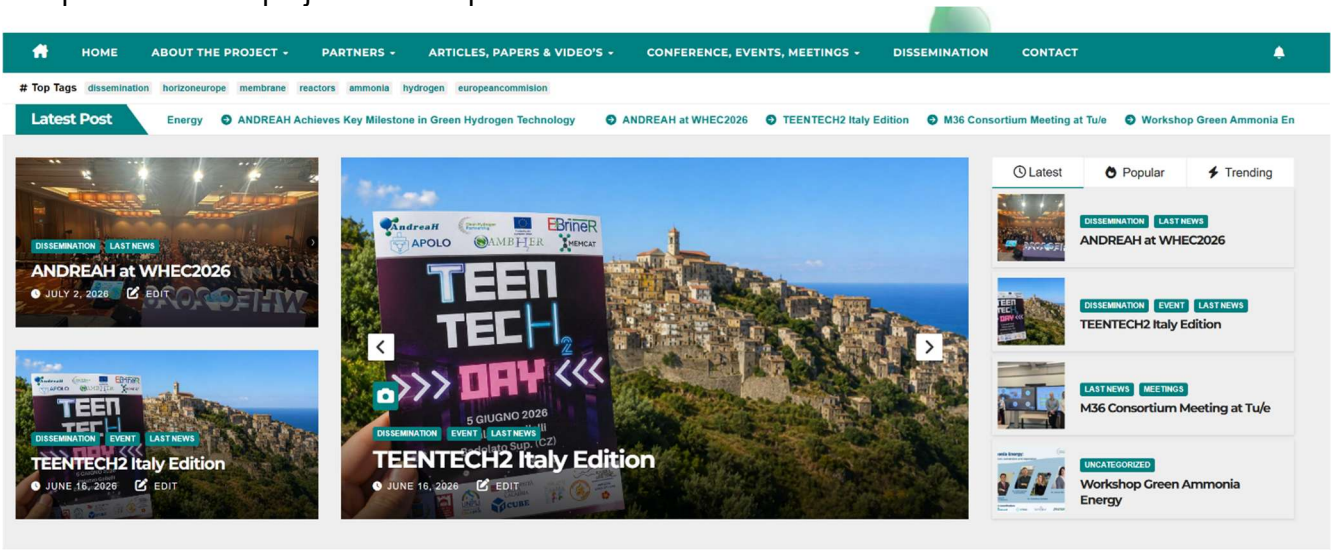



**Figure 13. updated ANDREAH project website, home page.**

The website has been designed in order to present the project aims as well as the main activities and results to all interested stakeholders.

The role of the website in the communications strategy is to provide a place for people interested in the project to get more in-depth information about the project activities and results. The dedicated website will produce an extensive record of all publications and communications originated on the course of the project.

The main website sections and their sub-pages available to each user are listed below:

- Home
- About the project: Introduction – Objectives – Expected results
- Partners
- Conferences, Events & Meetings
- Articles and papers
- Dissemination
- Contacts

During this last 18 months other subpages have been successfully added due to the contribution of the partners and to the dissemination activities that ANDREAH project has participated such as workshops, cluster projects and other journal and no scientific article.

### 3.1.6. Social Media

A strategic social media approach is actively underway, aimed at fortifying the ANDREAH project's visibility across scientific, industrial, and general public online domains.

To enhance efficiency, LinkedIN has been designated as the primary platform for disseminating key project updates and news. These updates will be seamlessly cross promoted on other social media channels such as Facebook, ensuring a synchronized and expanded outreach across diverse audiences.

The account of ANDREAH project for LinkedIN is reported in the figure below. It follows the same project identity used in different dissemination channels. It can be reached at https://www.linkedin.com/company/andreah-project/?viewAsMember=true

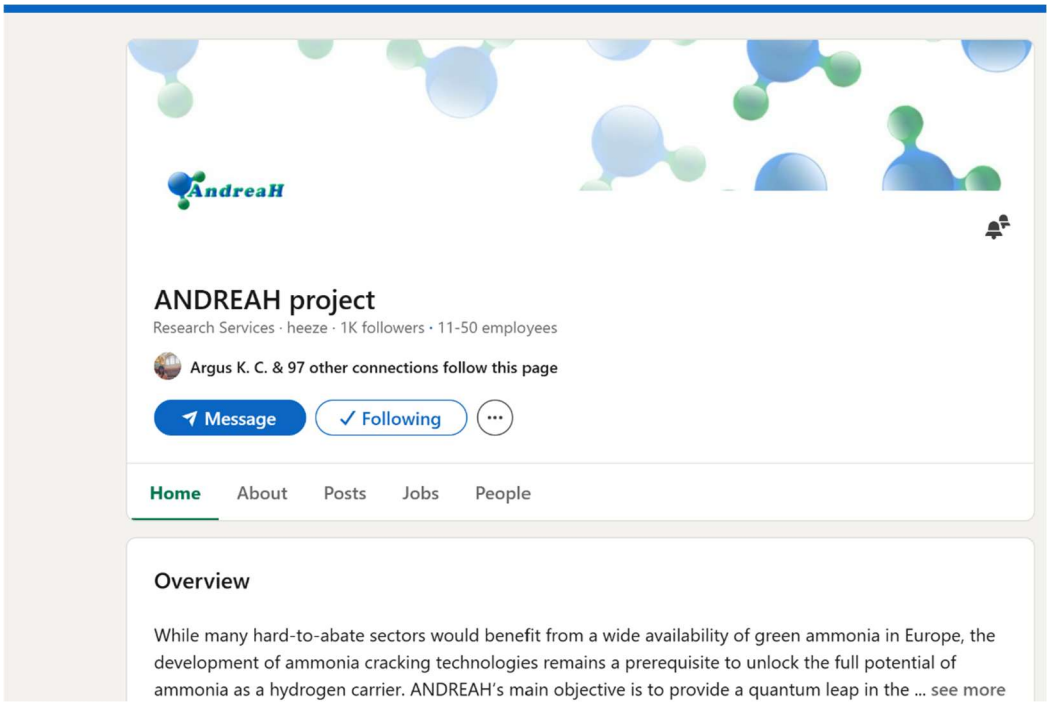



**Figure 14. ANDREAH project updated LinkedIN page.**

### 3.1.7. Newsletters and Press Release

Three newsletters and one press release have been released along the period, that can be downloaded from the public website https://www.andreahproject.eu/dissemination/ . The newsletters and press releases were also disseminated via LinkedIn, via email and available also in ZENODO community.

### 3.1.8. Scientific publications

Given that the ANDREAH project is advancing from TRL3 to TRL5, a significant portion of its outcomes is inherently of high scientific interest. The dissemination strategy will involve sharing these results through scientific, open-access, peer-reviewed publications.

The first paper has been already published and is available at:

Cechetto, V.; Anello, G.; Rahimalimamaghani, A.; Gallucci, F. Carbon Molecular Sieve Membrane Reactors for Ammonia Cracking. Processes 2024, 12, 1168. https://doi.org/10.3390/pr12061168

To increase dissemination a video has also been created on this paper and is available at https://www.youtube.com/watch?v=KJoJI7ePY7w

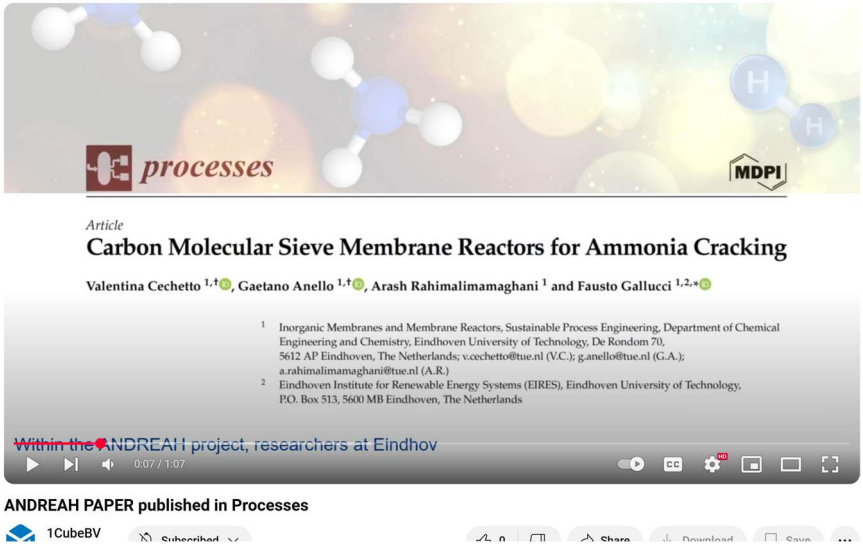



**Figure 15. Video on the first paper published in ANDREAH.**

A second paper has been published in processes:

Italiano, C.; Marino, G.; Thomas, M.; Hary, B.; Nardone, S.; Richard, S.; Saker, A.; Tasso, D.; Meynet, N.; Olivier, P.; et al. "Carbon-Free $H_2$ Production from Ammonia Decomposition over 3D-Printed Ni-Alloy Structures Activated with a $Ru/Al_2O_3$ Catalyst. Processes 2024, 12, 2663. https://doi.org/10.3390/pr12122663

The video of this journal is being produced.

### 3.1.9. No scientific articles

A total of six non-scientific articles were published specifically to raise awareness of energy storage within the ANDREAH project. Instead, awareness was successfully promoted through the organisation of

the TEENTECH2 Day in Italy, which provided an opportunity to engage students and the wider public in discussions on energy storage technologies and their role in the energy transition.
The event contributed to increasing public understanding of the project's objectives and highlighted the importance of innovation in sustainable energy solutions.
Those no scientific articles can be found by following this link: https://www.andreahproject.eu/other-journal-articles/

In addition, several presentations and posters have been presented at international conferences. The list is below with the link to the presentations that are open access available on the website of ANDREAH.

### 3.1.10. Posters and presentations:

**Posters**

- Poster by G.Anello at Symposium en Posterdag, 11th October 2024 https://nmg.nu/symposium-en-posterdag/
- Poster by M. Thomas (CNR-ITAE) at Hyceltec 2024, 30th June-3rd July
- Poster of ANDREAH project at ICCMR16 in San Sebastian
- Poster by CNR-ITAE at the 3rd edition of the Winter School Gasification and Membrane Reactors 2026

**Presentations:**
**2024**

- V. Cecchetto presentation (TU/e) at NPS19 2024, 8th and 9th October
- V. Cecchetto presentation (TU/e) at 3rd SoAE 2024, from 22nd to 26th Sept.
- V. Cecchetto presentation (Tue) at Hyceltec 2024, 30th June-3rd July
- A.P.Tanaka presentation (Tecnalia) at Hyceltec 2024, 30th June-3rd July
- Gallucci presentation (Tue) at Hyceltec 2024, 30th June-3rd July

**2025:**

- Winter School on Membranes and Membrane Reactors, 27th and 28th January in 1Cube facilities
- M. Thomas (CNR-ITAE) at ICSET, 22-26th June, Lipari
- A. Pacheco (TECNALIA) at 2nd Winter School of Membranes and Membrane Reactors, 27-28th January 2025, Eindhoven
- R. Montesano and P. Pinto (RINA) at 2nd Winter School of Membranes and Membrane Reactors, 27-28th January 2025, Eindhoven
- C. Italiano (CNR-ITAE) at 2nd Winter School of Membranes and Membrane Reactors, 27-28th January 2025, Eindhoven
- Minju Thomas (CNR-ITAE) at ICSET 2025, Lipari
- Jaione Ollo, Tecnalia 21st-23rd October SEPTech Conference, Eindhoven (NL) *General Presentation Project*
- Valentina Cechetto (TUE) 21st-23rd October SEPTech Conference, Eindhoven (NL)
- Minju Thomas (CNR-ITAE), 21st-23rd October SEPTech Conference, Eindhoven (NL)
- Jaione Ollo, Tecnalia 24th October Workshop on Ammonia as Energy Carrier, Eindhoven (NL) General Presentation Project
- Antonio Vita, CNR-ITAE, 24th October Workshop on Ammonia as Energy Carrier, Eindhoven (NL)
- Carolina Perez, Iberdrola 24th October Workshop on Ammonia as Energy Carrier, Eindhoven (NL)
- Valentina Cechetto, ICCMR17, 26-29 October, China

**2026:**

- TECNALIA & CNR-ITAE at Workshop Green Ammonia Energy 2026

- TU/e Valentina Cechetto at WHEC 2026 Singapore

In October 2024 a webinar on ammonia energy carrier was organized together with the project AMBHER.




**Figure 16. Joint webinar on Ammonia organised by AMBHER and ANDREAH.**

The presentations are available in the website of ANDREAH and the links also reported here
Presentations Webinar 17th October 2024:

- Dr. José Luis Viviente
- Dr. Margot Anabell LLosa Tanco
- Dr. Antonio Vita
- Mr. Gaetano Anello
- Dr. Valentina Cechetto

A video is also available at https://www.youtube.com/watch?v=HBBfIWPJcvk

RINA-C has also showcased the ANDREAH project at the Hydrogen Week in 2024.



**Figure 17. ANDREAH present at the Hydrogen Week in 2024.**

A second part of the Workshop "Ammonia as Energy Carrier", part II was organized at the end of October 2025. Program, speakers and presentations can be found by following this link: https://www.andreahproject.eu/workshop-october-2025/

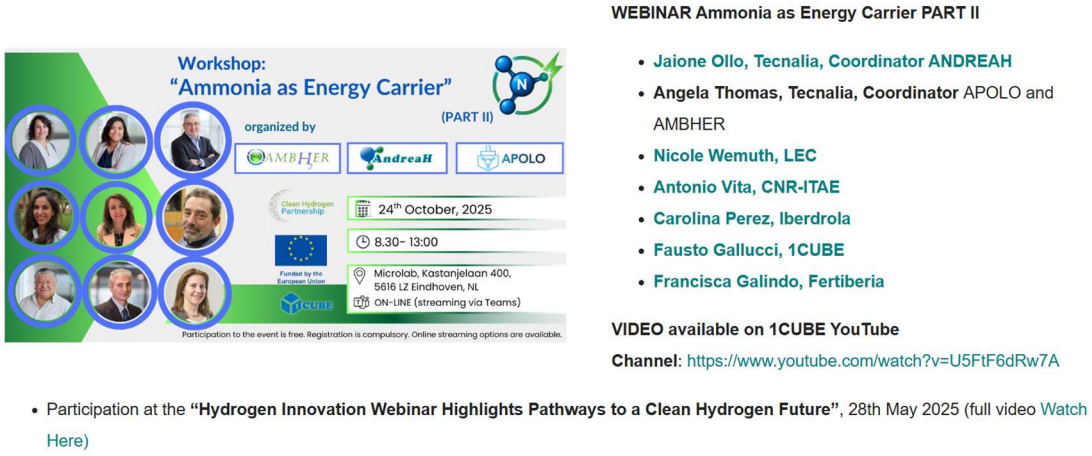



**Figure 18. Screenshot of the D&C page**

In April 2026, ANDREAH participated in another workshop "Green Ammonia Energy: intensified production, conversion and separation", where other five EU-funded projects were invited to participate: AMBHER , APOLO, CAIPIRINH3A, FASTER and MEASURED.
There is a specific webpage in ANDREAH website: https://www.andreahproject.eu/2026/02/03/workshop-april-2026/ where program, presentations and video have been collected.
Below some banners for communicating the workshop in the social media. The video of all presentation can be found in 1CUBE YouTube Channel, for example https://youtu.be/am4mghNDB1A









**Figure 19. Social media Banners**

Also, ANDREAH rollup has been showcased during the workshop and in the folder ANDREAH brochure has been distributed to all the attending researchers and stakeholders.




**Figure 20. Picture of ANDREAH rollup during Port Rotterdam Authority speaker**

### 3.1.11. Liaison / collaboration with relevant projects

During the last two years of the project, ANDREAH strengthened its collaboration with other complementary EU-funded projects.
With APOLO and AMBHER, ANDREAH project is part of the “A.A.A. Cluster” with the aim of maximizing the visibility, impact, and exploitation of the three initiatives and provided a common platform for coordinating dissemination and communication activities, exchanging knowledge, and promoting synergies among the projects.

1CUBE also contributed to the establishment of a broader cluster, “EUH2 Cluster, bringing together ÄNDREAH, APOLO, AMBHER, MEASURED, CARMA-H2 and, HYIELD.

Through the AAA and EUH2 clusters, numerous joint activities were organised, including workshops, webinars, conference sessions, and stakeholder engagement events, as described above. These initiatives enabled the participating projects to reach wider audiences, engage with the scientific community, industry, policymakers, and other relevant stakeholders, while enhancing the dissemination, exploitation, and long-term impact of their research and innovation outcomes.

## 4. CONCLUSIONS

The communication actions within the first 36 months of ANDREAH project are fully in line with the actions identified in the proposal and in the previous deliverables of WP6.

In the last year it is expected that more actions will be carried out, above all in the paper publications, other conferences, participation at general dissemination events etc.

# 5. ANNEXES

## Appendix I: dissemination follow up

The tables below are intended to report and keep track of all the dissemination initiatives at the partners' level to be updated each six months

**Table 2. Dissemination and communication activities:**

| Type of activities | Main leader | Title | Date | Place | Type of audience | Estimated Number of persons reached | Countries addressed |
|---|---|---|---|---|---|---|---|
| Participation in the ICCMR conference | 1CUBE | ANDREAH project, membrane reactors for ammonia decomposition | 15-18 October 2023 | San Sebastian, Spain | Scientific | 115 | EU, Japan, China, India |
| Participation in Hyceltec 2024 conference | TUE | Hydrogen production from ammonia in carbon molecular sieve membrane reactors | 29/6-3/7 2024 | Milazzo | Scientific | 150 | EU, Japan, China, Australia, US, India |
| Participation in Hyceltec 2024 conference | TUE | Membrane reactors for hydrogen production | 29/6-3/7 2024 | Milazzo | Scientific | 150 | EU, Japan, China, Australia, US, India |
| Participation in Hyceltec 2024 conference | TEC | AmmoNia baseD membRane rEActor for green Hydrogen production | 29/6-3/7 2024 | Milazzo | Scientific | 150 | EU, Japan, China, Australia, US, India |
| Participation in Hyceltec 2024 conference | CNR-ITAE | Activation of Triply Periodic Minimal Surface (TPMS) microarchitectures with LaNiO3 based perovskites for low temperature ammonia decomposition | 29/6-3/7 2024 | Milazzo | Scientific | 150 | EU, Japan, China, Australia, US, India |
| Poster at NPS netherlands | TUE | Carbon membranes for ammonia decomposition in membrane reactors | 8-9 Oct. 2024 | Groningen | Scientific | 225 | EU |
| Presentation at NPS | TUE | Techno-economic assessment of a decentralized system for pure hydrogen production via green ammonia decomposition | 8-9 Oct. 2024 | Groningen | Scientific | 225 | EU |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Presentation at ICSET | CNR-ITAE | MAGNESIUM-DOPED LANTHANUM NICKELATEPEROVSKITES FOR AMMONIA DECOMPOSITION: KINETIC ANALYSIS AT LOW TEMPERATURES | 22-26th June 2025 | Lipari | Scientific | 250 | EU |
| Presentation at winter School 2025 | TECNALIA | Pd and Carbon membranes for hydrogen separation | 27-28 February 2025 | Eindhoven | Scientific | 30 | EU |
| Presentation at winter School 2025 | RINA | Life Cycle Assessment (LCA) Methodology, Applications and Case Studies | 27-28 February 2025 | Eindhoven | Scientific | 30 | EU |
| Presentation at winter School 2025 | CNR-ITAE | Reaction kinetics of heterogenous catalysts. On the mechanism of hydrogen production from ammonia decomposition | 27-28 February 2025 | Eindhoven | Scientific | 30 | EU |
| Presentation at SEPTECH conference | TU/e | Design of a CMSMbased membrane reactor system for ammonia decomposition (ANDREAH project) | 21-23 October 2025 | Eindhoven | Scientific | 120 | International |
| Presentation at SEPTECH conference | CNR-ITAE | Mg-Doped LaNiO3 Perovskites for Ammonia Decomposition: Kinetic Analysis at Low Temperatures | 21-23 October 2025 | Eindhoven | Scientific | 120 | International |
| Presentation at Workshop on Ammonia as Energy Carrier | TECNALIA | General presentation of ANDREAH project | 24th October 2025 | Eindhoven | Scientific | 30 | EU |
| Presentation at Workshop on Ammonia as Energy Carrier | CNR-ITAE | CATALYSTS “AMMONIA SYNTHESIS” | 24th October 2025 | Eindhoven | Scientific | 30 | EU |
| Presentation at Workshop on Ammonia as Energy Carrier | IBERDROLA | Green Energy Carriers | 24th October 2025 | Eindhoven | Scientific | 30 | EU |
| Presentation at ICCMR17 | TUE | Marine auxiliary power from ammonia: a techno-economic assessment of a membrane reactor-based system | 28TH October 2025 | Nanjing | Scientific | | International |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Presentation at Workshop Green Ammonia Energy 2026 | CNR-ITAE | SCALE-UP OF PERIODICAL OPEN CELLULAR STRUCTURED (POCS) CATALYSTS: LESSONS LEARNED FROM AMBHER AND ANDREAH PROJECTS FOR INTENSIFIED AMMONIA SYNTHESIS AND DECOMPOSITION IN MEMBRANE REACTORS | 1st April 2026 | Eindhoven | Scientific | 60 | EU |
| Presentation at Workshop Green Ammonia Energy 2026 | TECNALIA | Project public presentation | 1st April 2026 | Eindhoven | Scientific | 60 | EU |
| Poster at 3rd Winter School 2026 | CNR-ITAE | Mg-doped LaNiO3 perovskites for ammonia decomposition: Kinetic Analysis at low temperatures | 25-26February 2026 | Eindhoven | Scientific | 35 | EU |
| | | | | | | | |

**Table 3. Scientific publications (This field is only for peer reviewed articles)**

| Type of scientific publication | Title of the scientific publication | DOI | ISSN or eSSN | Authors | Title of the journal or equivalent | Number, date | Publisher | Place of publication | Year of publication | Relevant pages | Public & private participation | Peer-review | Is/Will open access provided to this publication |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Article in Journal | Carbon Molecular Sieve Membrane Reactors for Ammonia Cracking | https://doi.org/10.3390/pr12061168 | | Valentina Cechetto , Gaetano Anello, Arash Rahimalimamaghani and Fausto Gallucci | Processes | 12, 2024 | MDPI | Switzerland | 2024 | 1168 | *NO* | *YES* | Yes - Gold OA |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Article in Journal | Carbon-Free H2 Production from Ammonia Decomposition over 3D-Printed Ni-Alloy Structures Activated with a Ru/Al2O3 Catalyst | doi.org/10.3390/pr12122663 | | Cristina Italiano, Gabriel Marino, Minju Thomas , Benjamin Hary, Steve Nardone, Simon Richard, Assia Saker, Damien Tasso, Nicolas Meynet, Pierre Olivier, Fausto Gallucci and Antonio Vita | Processes | 12, 2024 | MDPI | Switzerland | 2024 | 2663 | *YES* | *YES* | Yes - Gold OA |