PEACE

NEWSLETTER No. 6

on hydrogen production

May 2025

Content

1. Editorial

As spring unfolded, so did a crucial phase in the PEACE project's journey—marked by intensive internal discussions and focused evaluations with the Clean Hydrogen Partnership (CHP). This issue of our newsletter offers a behind-the-scenes look at a season filled with strategic alignment.

We begin with a recap of our latest project meeting, where partners gathered to take stock of technical progress and refine our shared roadmap. The momentum continued with a focused internal workshop, enriched by insights from guest experts, bringing new perspectives to our R&D efforts.

Our presence at Hannover Messe 2025 offered another important opportunity to showcase PEACE innovations on a global stage—demonstrating our relevance and readiness in the rapidly evolving hydrogen landscape.
Finally, this issue covers our formal project review with CHP—a vital checkpoint that not only assessed our achievements but also shaped expectations for the months ahead.

As always, we thank our consortium members and stakeholders for their continued commitment. Stay connected with us as we push the frontiers of cost-effective, flexible alkaline electrolysis.

PEACE project website

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2. About PEACE

"Pressurized Efficient Alkaline EleCtrolysEr" (PEACE) project is a research and innovation activity funded under the EU Horizon Europe programme by the Clean Hydrogen Partnership and coordinated by the German Aerospace Center (DLR). The PEACE project will deliver **high-pressure alkaline electrolysis** (AEL) technology which will substantially **reduce hydrogen production costs**. We will propose a new concept of hydrogen production with **two-stage pressurization** that will be demonstrated on an AEL system of 50 kW capable of operating at pressures exceeding 50 bar. The integration of advanced components, innovative design, and optimized operation strategies will be explored through modelling and experimental testing, ultimately aiming to demonstrate a system with impressive efficiency characteristics (see more on PEACE website).

Project members: German Aerospace Center (DLR); Materials Mates Italia (MMI); Eindhoven University of Technology (TU/e); Brandenburgische Technische Universität Cottbus Senftenberg (BTU); GRANT Garant (GG); The Hydrogen Chemistry Company (HyCC); Technical University of Denmark (DTU)

Fig. 1 PEACE Project Team (Feb. 2024), Source: PEACE project (CC-BY-NC-ND 4.0)

2.1 FOURTH PEACE PROJECT MEETING

In early February 2025, the PEACE project coordinating institution, the **DLR Institute of Engineering Thermodynamics,** hosted the **fourth all-hands project meeting** in Stuttgart, followed by an internal workshop (see section 2.2).

The mid-term hybrid meeting assessed the progress of the PEACE's research into highly pressurized alkaline electrolysis (AEL) where we aim to reduce the cost of (green) hydrogen production and its subsequent utilisation.

By late 2024, the project had met its first major **research targets**: (1) the qualification of cell components, and (2) the design and production of stack components for high-pressure AEL operation (see more in Newsletter#5). These achievements were discussed, and the next steps were outlined, as 2025 is set to be a year full of key milestones.

The meeting was opened by the Coordinator, Dr. Fatemeh (Sanaz) Razmjooei, Institute of Engineering Thermodynamics at German Aerospace Center (DLR). She summarised the project's main achievements at mid-term: PEACE has delivered twelve reports to the Clean Hydrogen Partnership (the granting authority) in accordance with the project plan.

Figure 2: PEACE Project team during the 4th project meeting, Source: DLR (CC-BY-NC-ND 4.0)

The Work Package (WP) Two **(WP2)** team at Eindhoven University of Technology (TU/e) and DLR summarised the latest findings on the **qualification of cell components**. The high-performance benchmark of 1 A/cm^2 at 1.8V was fulfilled.

Tested **separators** demonstrated comparable and reasonable gas purity within a specific current density range. Outcomes of this achieved task guided the careful selection of substrates and membranes, as well as informed the design of a PEACE cell. **Cell design** will be elaborated as to minimize contact resistances and reduce gas crossover which is assumed to be a major challenge for high pressure hydrogen production.

As outlined by contribution of Eindhoven University of Technology (TU/e) , the qualified components were undergoing further comparative testing at TU/e (in a pressurized single cell under the following conditions: 50 barg, 80°C, and over 100 hours of continuous operation) (see Fig. 3). Results are expected soon.

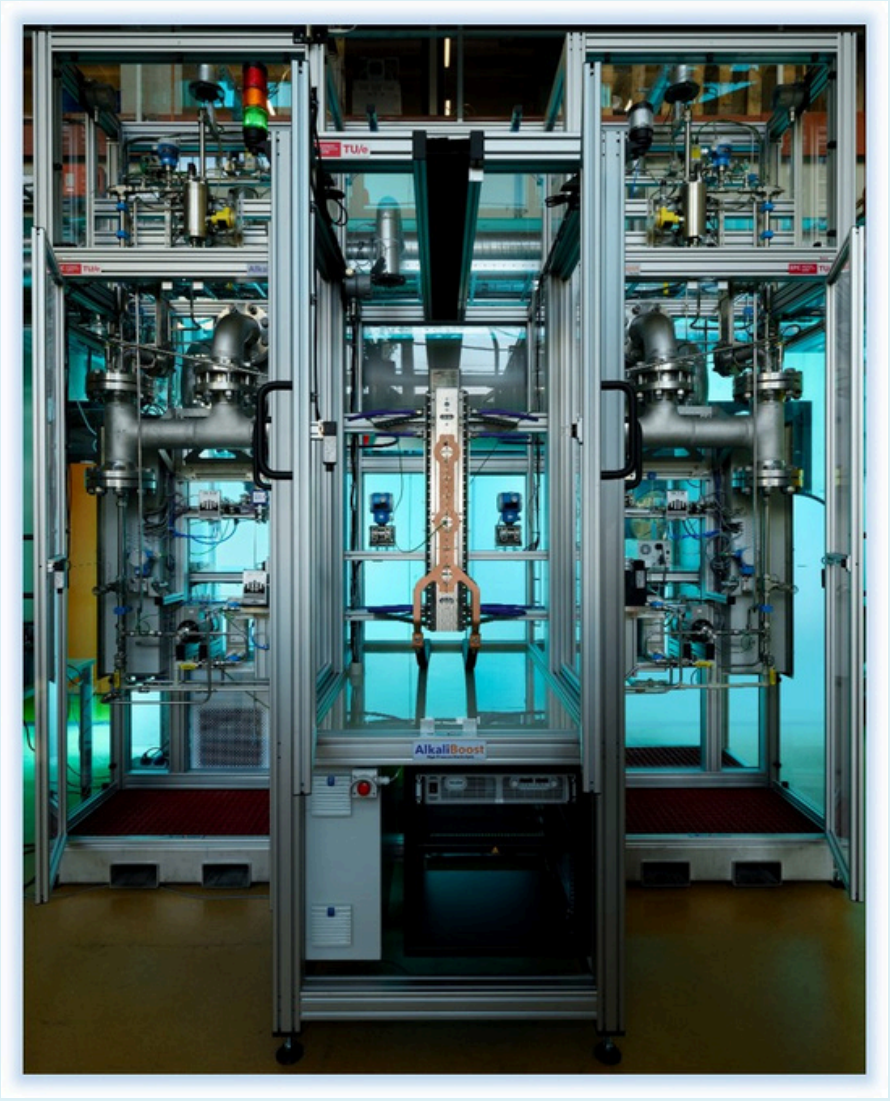

Figure 3: TU/e testing facility for electrochemical performance under pressurized conditions, Source: TU/e (CC-BY-NC-ND 4.0)

In **WP3**, the partner Materials Mates Italia (MMI) reached an important milestone at the end of 2024 with the **design of the PEACE stack components**. All the materials and technologies required for constructing the PEACE demonstrator stack were set with a vision of sustaining high-efficiency of the hydrogen production while lowering the overall cost of the stack.

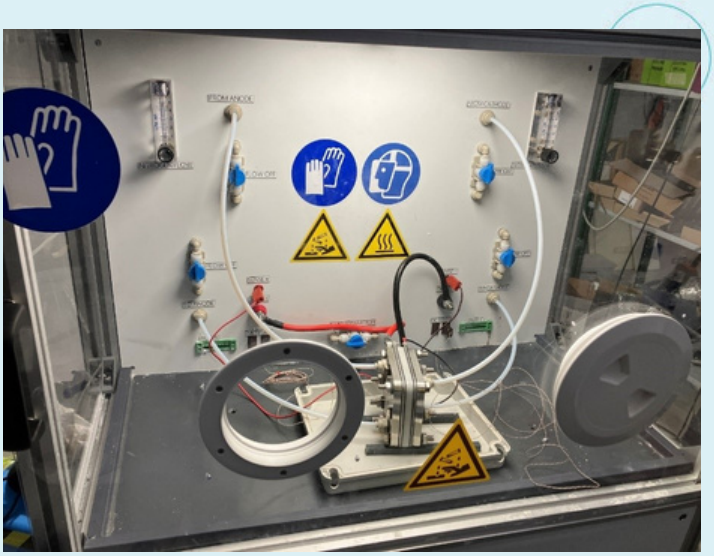

Figure 4: MMI Test bench, Source: MMI (CC-BY-NC-ND 4.0)

MMI designed and leak-tested under pressurized conditions a laboratory-scale **cell for material evaluation**. It was subsequently scaled up to a full-size model and measurements of performance for components such as elastic elements and O-ring gasketing were performed (see the test bench in Fig. 4). MMI is currently ready for the short stack assembly where the identified technologies and components will be integrated into a life-size object.

PEACE **WP4** is led by the team of Brandenburgische Technische Universität Cottbus Senftenberg (BTU). In their presentation, they have concluded the **Piping and Instrumentation diagram** (P&ID) for the high-pressure setup of the PEACE demonstrator that would be mounted at their premises. They had already prepared the spot by dismantling the "old" test stack (see Fig. 5). Hardware and sensors for the demonstrator are on their way. **Safety protocols and procedures** are being developed in accordance with the Hazard and Operability (HAZOP) framework and the Failure Mode and Effects Analysis (FMEA) approach.

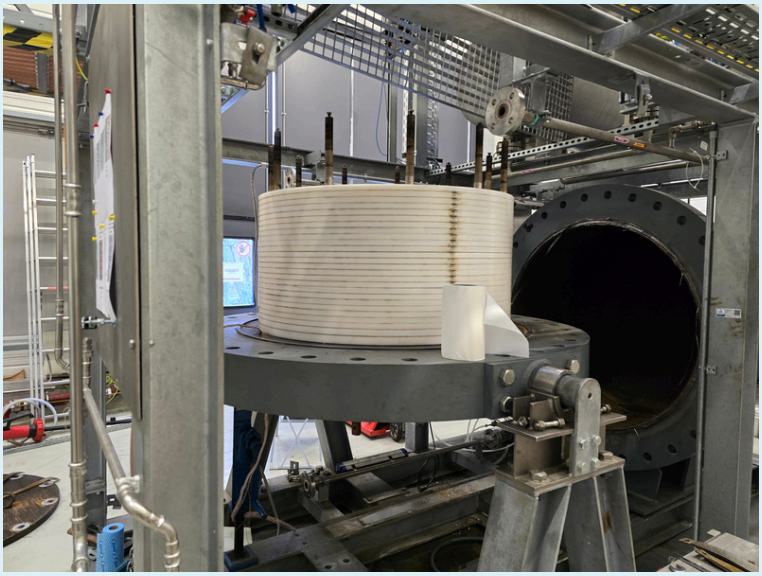

Figure 5: The old BTU stack was cleaned and each cell was dismounted and stored, Source: BTU (CC BY-NC-ND 4.0)

The **WP5** team at DLR presented its outcomes of the **TEMPEST modelling framework** to complete the PEACE electrolyser system (pressure vessel and other BoP parts). Operating strategies are currently defined to improve gas purity in the PEACE stack.

Simultaneously, DTU team works upon a **life cycle assessment** to quantify the environmental impacts of the PEACE technology. A set of life-cycle-inventory data for PEACE high pressure alkaline water electrolysis is currently under preparation with reference data collection.

WP6 leader, GG, sustains a continuous **communication** flow on the PEACE project towards the external audience through the PEACE website, PEACE X and LinkedIn profiles (Fig. 6). Strong engagement and audience growth were reported supporting the project's impact.

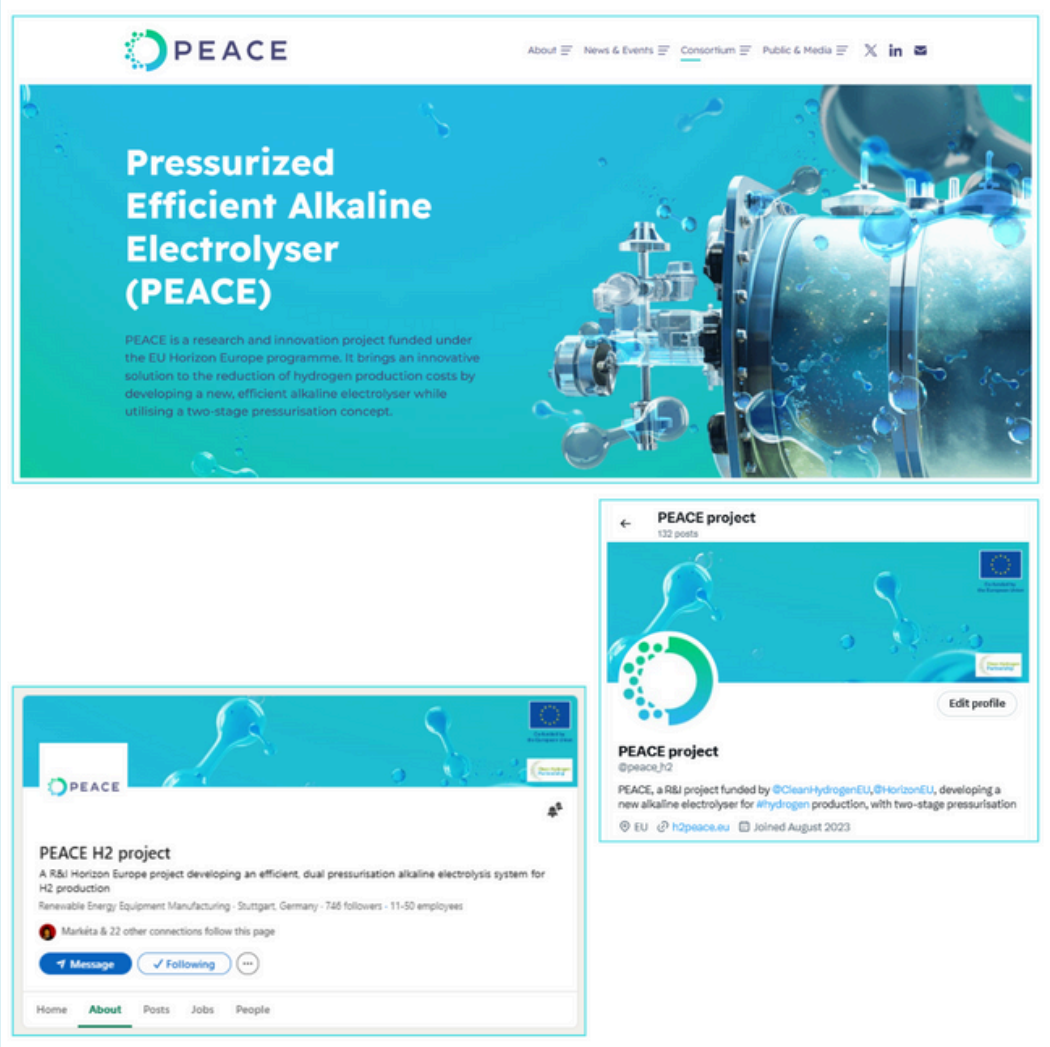

Figure 6: PEACE Project Communication channels (website, LinkedIn, X), Source: GG (CC BY-NC-ND 4.0)

The meeting featured in-depth discussions, brainstorming, and knowledge sharing among all partners. We concluded that the PEACE project is progressing well, with significant **research targets ahead**.

2.2 PEACE INTERNAL WORKSHOP WITH SPECIAL GUESTS ON HYDROGEN PRODUCTION

Folowing the PEACE project meeting, an **internal workshop on alkaline electrolysis and green hydrogen production** was organised by the PEACE project coordinator, Dr. Fatemeh (Sanaz) Razmjooei (DLR Institute of Engineering Thermodynamics). PEACE project members gathered alongside **invited experts** working on various electrolyser technologies.

Key insights into alkaline water electrolysis were shared by **prof. Thomas Turek** (Technische Universität Clausthal). **Olivier Bucheli** (Adele Hydrogen) provided an inspiring outlook on the future of green hydrogen production, with a focus on advanced alkaline electrolysers.

The workshop also featured valuable contributions from representatives of hydrogen production-oriented research and innovation projects. Colleagues from the **HYPRAEL project** presented their work on advanced alkaline electrolysis technologies for compressed hydrogen production. Gareth Keeley (Commissariat à l´énérgie atomique et aux énergies alternatives) introduced the **AEMELIA project**, which is innovating in anion exchange membrane water electrolysis. Additionally, the Horizon Europe project **CLEANHYPRO** shared its approach to establishing an Open Innovation Test Bed, aimed at scaling up circular innovative materials and components for electrolysis.

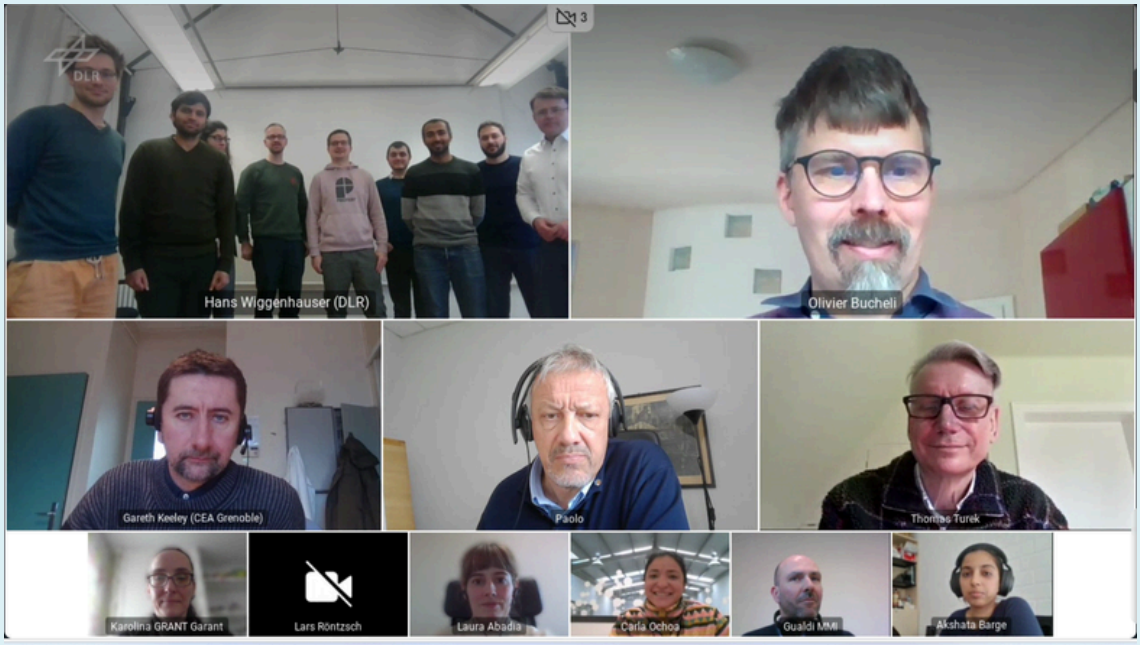

Figure 7: PEACE Internal workshop participants, Source: PEACE project (CC-BY-NC-ND 4.0)

The workshop was an excellent opportunity for research and innovation networking, fostering discussions on sustainable and cost-effective hydrogen production across different electrolysis technologies.

2.3 PEACE PROJECT AT HANNOVER MESSE

The PEACE project team represented by prof. Lars Röntzsch & Hesham Mahfouz, M.Sc., Brandenburg University of Technology Cottbus - Senftenberg (BTU), successfully participated at **Hannover Messe 2025**. One of the world's largest and most influential industrial trade fairs hosted this year more than 4,000 exhibitors and 120,000 visitors, with a strong presence of hydrogen community.

Thanks to the direct support of Brandenburg University of Technology Cottbus - Senftenberg (BTU), the PEACE project was proud to present its innovative two-stage pressurization concept for developing a new and more efficient alkaline electrolyser. This breakthrough aims to significantly reduce the cost of green hydrogen production, helping deliver practical, scalable solutions for a decarbonised energy future.

Figure 8: PEACE project at Hannover Messe 2025, Source: PEACE project (CC-BY-NC-ND 4.0)

But Hannover Messe was more than just a stage for technology. It was a **hub of dynamic exchange** — bringing together researchers, industry partners, and policy advocates from around the world. These connections reinforced our shared vision of hydrogen as a central pillar of a clean, sustainable energy system. "The conversations we had were energizing and reaffirmed our commitment to accelerating green hydrogen innovation.", summarised prof. Lars Röntzsch.

2.4 FORMAL REVIEW WITH THE CLEAN HYDROGEN PARTNERSHIP

In March, the PEACE project successfully underwent a **formal review with its granting authority**, the Clean Hydrogen Partnership, supported by two external expert reviewers, to close down its first reporting period within the Horizon Europe programme scheme.

Following the submission of our **mid-term project report**, an online technical review was jointly organised by the project coordinator and the granting authority. The review assessed the project's progress in relation to the management plan and the expected scientific and technological impacts outlined in the Grant Agreement.

During more than half a day of presentations and discussions, the PEACE consortium showcased the **main achievements of all project work packages** and outlined the way forward. We received valuable and much-appreciated feedback from the Clean Hydrogen Partnership, particularly on our management and dissemination activities. The external experts positively assessed the technological milestones reached so far, expressed support for the project's current direction, and encouraged further progress.

The evaluators stimulated a **fruitful discussion**, focusing on ways to broaden the project's potential impact and on project key innovations. No major disagreements emerged, which confirms that the PEACE project is progressing well—moving steadily toward achieving its ambitious research targets.

3. Hydrogen News

Clean Hydrogen Partnership 2025 call for projects closed

In late April, the Clean Hydrogen Partnership (CHP) closed its **2025 Horizon Europe call for proposals.** Grants totalling €184.5 million will be awarded to hydrogen innovation projects across 19 predefined areas. The call attracted **212 proposals** in total.

The strongest interest among applicants (88 proposals) was seen in the field of **renewable hydrogen production**, accounting for approximately 40% of all submitted proposals. This reflects the sector's focus on cost reduction and efficiency improvements in various renewable hydrogen production pathways, with **electrolysis as the dominant technology.** Most proposals in the domain of renewable hydrogen production addressed the topic of enhancing the lifetime and reducing the cost of low-temperature electrolysers (HORIZON-JU-CLEANH2-2025-01-01).

As CHP also supports innovations in **alternative hydrogen production routes**, such as direct sunlight-driven processes (e.g. thermal dissociation of water using concentrated solar energy or photocatalysis), as well as biomass, biogas, or other biological methods, significant interest was also shown in the area of hydrogen and solid carbon production from renewable gases or biogenic waste, with 14 proposals submitted. The exploration of natural hydrogen (HORIZON-JU-CLEANH2-2025-01-07) received a similar level of attention, also with 14 submissions.

Another highly popular area within the CHP call (35 proposals) was the **development of hydrogen valleys** - integrated hydrogen ecosystems covering specific geographic areas (such as industrial clusters, ports, or cross-border corridors), where various final applications share a common hydrogen supply infrastructure. Projects are expected to demonstrate how different hydrogen technologies can work in synergy and integrate with existing assets such as renewable energy sources, gas networks, electricity and heat grids, and energy storage systems.

The area of **end uses of hydrogen**, particularly in the heat and power sector, also proved competitive. Nineteen proposals were submitted under the call "Demonstration of stationary fuel cells in renewable energy communities" (HORIZON-JU-CLEANH2-2025-04-01), aiming to showcase combined heat and power generation using hydrogen technologies in real-world settings.

Overall, the 2025 call attracted a high level of interest and competition across all areas. Final evaluation is expected to be announced in August 2025.

Source of the news

Second Hydrogen Bank auction attracted 61 bids: 15 projects were selected

The European Hydrogen Bank's second auction for the production of renewable hydrogen, with the total funding of €1.2 billion, has drawn **strong interest**, **with 61 bids submitted by projects from 11 countries** within the European Economic Area. The auction was designed to support the production of renewable hydrogen through a fixed premium scheme.

Project developers submitted bids for support in the form of a fixed premium per kilogram of renewable hydrogen produced over a period of up to 10 years. The premium, for which project promoters bid in the auction, covers the gap between the cost of production and the price buyers are currently willing to pay for renewable hydrogen.

The evaluation results of the auction have been just announced: **15 projects** across the EU will receive a total of €992 million, with the goal to produce 2.2 million tonnes of renewable hydrogen over ten years, avoiding 15 million tonnes of CO2 emissions. Most successful project are located in Spain (8) and Norway (3), followed by Germany (2), the Netherlands (1), and Finland (1).

Meanwhile, preparations are underway for a third auction, which is expected to launch before the end of 2025.

Source of the news

4. Hydrogen Events

Water Electrolysis Gordon Research Conference, 15-20 June, 2025, Waterville Valley (USA)

The Water Electrolysis Gordon Research Conference, titled Empowering Low Temperature Electrolysis through Fundamentals Illumination and Materials Innovation, was dedicated to advancing the boundaries of water electrolysis research. The program featured cutting-edge presentations, interactive poster sessions, and informal networking opportunities. A wide range of topics was covered, including electrode kinetics, catalyst design, membrane polymer synthesis, as well as system integration, aiming to advance low to intermediate-temperature electrolysis technologies.

Dr. Thijs de Groot, a distinguished member of the PEACE project team from Eindhoven University of Technology, gave a speech on June 18, 2025, and focused on flexibility in alkaline water electrolysis — a key topic in the drive toward more efficient and adaptable hydrogen production systems.

Event link

European Electrolyser and Fuel Cell Forum, 1 – 4 July, 2025, Lucerne (CH)

The 29th issue of the well-renowned conference is dedicated to low-temperature fuel cells, electrolysers and hydrogen processing. It includes exhibition and tutorials.

Event link

ICE 2025, 5th International Conference on Electrolysis, 25-29 Aug., 2025, Freiburg (DE)

This year, the International Conference on Electrolysis (ICE) - key platform for sharing breakthroughs in electrolysis technology, energy conversion, and green hydrogen production—moves to Freiburg, Germany. Five days of scientific sessions are complemented by lab tours and hands-on workshops on CCM production research for membrane electrolysis, career development in hydrogen, and green hydrogen. Registration is still open – don't miss this landmark event!

The PEACE project is definitely heading to Freiburg! We are proud to announce that **Dr. Thijs de Groot** of Eindhoven University of Technology will represent PEACE as invited speaker in the scientific program. In addition, **Saksham Pandey**, also from Eindhoven University of Technology, will present an interesting poster titled "Minimizing ohmic resistance in alkaline water electrolyzers". Follow our PEACE LinkedIn page to get more updates!

Event link

5. Hydrogen Project Funding Opportunities

Coordinated call with India on waste to renewable hydrogen

An open Horizon Europe call for Research and Innovation action (HORIZON-CL5-2025-02-D2-08) aims to support the development of innovative technologies **for producing renewable hydrogen from biogenic wastes without recycling potential** such as agricultural, forest and biogenic part of municipal wastes, sewage sludge and industrial waste waters using biochemical and thermochemical pathways. The expected outcomes include improved sustainability, safety, and affordability of renewable hydrogen production, an expanded technology portfolio for developers in the EU and India. Proposals are expected to demonstrate coordinated efforts between EU and Indian partners, with joint activities, synchronized timelines, and shared targets. A 10,000,000 EUR budget is expected to be attributed to two selected grants.
Submission deadline: 02 September 2025

European Research Council (ERC) Proof of Concept grants

A special type of grant (ERC-2025-POC) **dedicated only to Principal Investigators** of the ERC funded research which aims to facilitate exploration of the commercial and social innovation potential of their ERC funded research. A lump sum of EUR 150,000 for a period of 18 months will be granted to finance proof of concept of ERC studies for Principal Investigators in an ongoing main grant or in a main grant that has ended after 1 January 2024.
Next cut-off date: 18 September, 2025

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"Pressurized Efficient Alkaline EleCtrolysEr" (PEACE) is a research and innovation project funded under the EU **Horizon Europe programme** by the **Clean Hydrogen Partnership.**

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