PEACE

NEWSLETTER No. 7

on hydrogen production

October 2025

Content

1. Editorial

We are pleased to share the latest updates from the PEACE project as we move closer to demonstrating our **pressurized alkaline electrolyser technology**. This issue celebrates another key milestone: the successful qualifica**tion of electrochemical cell under pressurized conditions,** paving the way for short stack construction and testing.

Alongside technical progress, we highlight new developments in i**ntellectual property management**, a fresh **DLR publication**, and PEACE's strong presence at **major scientific conferences.**

As the project continues advancing toward its demonstrator stage, we remain committed to translating our research results into **impactful innovations** that will strengthen Europe's **green hydrogen capabilities**.

Dr. Fatemeh Razmjooei, PEACE project coordinator

German Aerospace Center (DLR)
Institute of Engineering Thermodynamics / Energy System Integration Department
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PEACE project website

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 FURTHER PEACE MILESTONE REACHED ON THE CELL LEVEL

After around six months of rigorous electrochemical cell testing under pressurized conditions, PEACE researchers from **Eindhoven University of Technology** (TU/e) and **German Aerospace Center** (DLR) have submitted their findings on **cell qualification under pressurized conditions** to the Clean Hydrogen Partnership.

The resulting report provides the foundation for substrate selection, membrane/diaphragm selection, and cell design for larger-scale testing within the PEACE project. It builds on earlier qualification work performed at lower pressures at the beginning of the PEACE project (see Newsletter No.5).

Electrochemical and gas purity tests under pressurized conditions were carried out at both DLR and TU/e (Fig). The project reached to the goal of **performance at 1 A cm^{-2} below 1.8 V with the large cell of 100 cm^2 under pressurized conditions.**

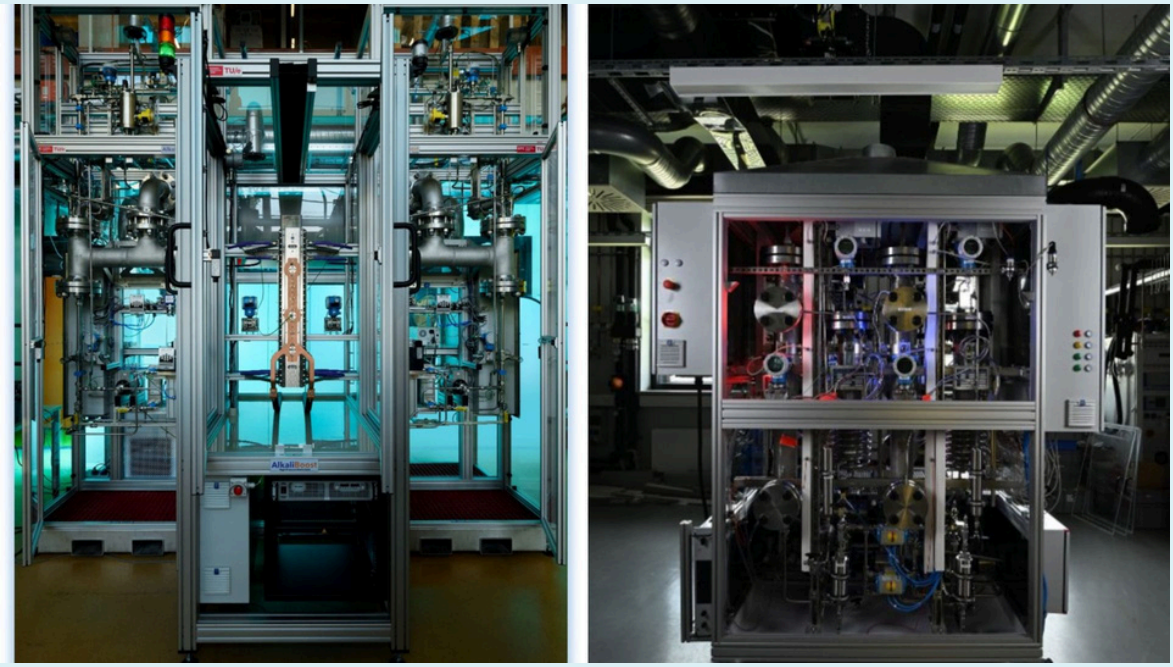

Figure 2: TU/e (left) and DLR (right) facility for electrochemical performance testing under pressurized conditions used within the PEACE project, Source: TU/e & DLR (CC-BY-NC-ND 4.0)

The results demonstrate that **pressurized operation has no major influence on electrochemical performance** and confirm that efficient alkaline water electrolysis operation at higher current densities is feasible.

2.2 ROUTE TOWARDS THE PEACE DEMONSTRATOR: SHORT STACK CONSTRUCTION

The PEACE project is getting closer to the demonstrator stack assembly! The industrial partner **Materials Mates Italia (MMI**) has produced and assembled a **three-cell short stack** for further qualification.

The short stack has been specifically designed to ensure seamless integration within the **Brandenburg University of Technology Cottbus - Senftenberg (BTU)** pressure vessel, meeting the required performance and safety standards.

The PEACE **short stack** consists of: Plastic parts (separator body & gasket press), Metal parts (bipolar plates & current collector plates), Elastic element, Sealings, Cell components & Endplates (see Figure 3).

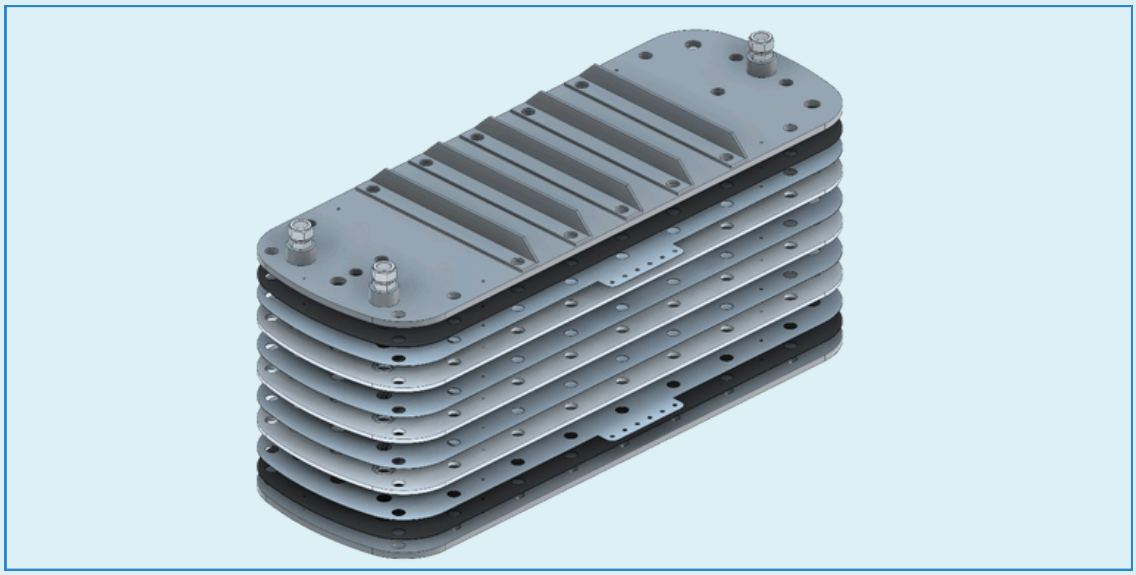

Figure 3: PEACE short stack (exploded view), Source: MMI (CC-BY-NC-ND 4.0)

The short stack underwent **leak and pressure tests** to verify mechanical integrity and gasket performance. It is now on its way to **BTU**, where it will be mounted, with the assistance of MMI, into a pressure vessel for series of high-pressure performance tests.

This achievement highlights the **strong collaboration between industrial and research partners** within the PEACE consortium. The joint efforts of MMI and BTU, building on previous results of DLR and TU/e, exemplify how combining industrial know-how with academic excellence accelerates technological progress towards the PEACE demonstrator.

2.3 IMPORTANT UPDATES TO THE PEACE INTELLECTUAL PROPERTY RIGHTS STRATEGY AND THE COMMUNICATION, DISSEMINATION & EXPLOITATION STRATEGY

During the summer, partner **GRANT Garant (GG)** delivered **two updated reports** to the granting authority – both addressing project results and ways to maximize their impact.

Firstly, the matured version of the **Intellectual Property Rights (IPR) strategy** presented PEACE's main intellectual assets – the **Key Exploitable Results** (KERs) – together with their anticipated forms of protection (Figure 4).

Key Exploitable Results (KER)	Owner(s)
KER1: Extension of modelling data set and test protocols for dynamic operation	DLR Deutsches Zentrum für Luft- und Raumfahrt German Aerospace Center
KER2: Dispatch model for integrated plant	HyCC
KER3: Stack components design	MaterialsM Instruments
KER4: HAZOP / FMEA Analysis	MaterialsM Instruments; b-tu Brandenburg University of Technology Cottbus - Senftenberg
KER5: Improved small-scale cell for alkaline water electrolysis	TU/e Eindhoven University of Technology
KER6: AEL dual stage pressure system	MaterialsM Instruments; b-tu Brandenburg University of Technology Cottbus - Senftenberg
KER7: Life cycle inventory data	DTU *& all PEACE scientific and technical partners*

Figure 4: PEACE Key Exploitable Results, Source: PEACE (CC-BY-NC-ND 4.0)

Subsequently, an updated version of the **PEACE Plan for the Exploitation and Dissemination of Results (PEDR)** was submitted, which brought new insights into KERs exploitation. Scientific exploitation remains predominant and is foreseen to some extent by all PEACE partners. Follow-up R&I activities will be undertaken to increase the TRL of key results.

Direct **commercial exploitation** will be pursued by MMI, who aims to expand its product portfolio. Meanwhile, **indirect commercialisation** routes are being explored by several partners, such as licensing results to third parties or establishing spin-offs (TU/e).

The PEACE project remains on track with its dissemination and exploitation efforts and is expected to further **expand its impact** towards the end of the project.

2.4 NEW PEACE PUBLICATION BY THE DLR TEAM

Researchers from the **Institute of Engineering Thermodynamics, German Aerospace Center (DLR)**, have co-authored a new peer-reviewed article in **Journal of Membrane Science** (Elsevier).

The paper, titled "Tuning properties of PEO-functionalized ion-solvating blend membranes via PEO side chain length: Impact on alkaline water electrolysis performance" demonstrates the high-performance potential of **ion-solvating-type membranes in alkaline water electrolysis (AWE).**

The study introduces a polymer blend strategy to create high-performance membranes with excellent conductivity, stability, and durability under demanding electrochemical conditions.

Key highlights:

- **Innovative Membrane Design:** Novel PEO-functionalized copolymers blended with m-PBI which resulted in membranes that combine mechanical stability with high ionic conductivity.
- **Promising Electrolyzer Performance:** The DLR-tested membranes, developed with PEACE support, outperformed commercial benchmarks in current density while maintaining satisfying level of safety (in terms of hydrogen crossover).

The AWE-based developed membranes represent a promising pathway to improve efficiency and durability in large-scale green hydrogen production.

Article details

Title: Tuning properties of PEO-functionalized ion-solvating blend membranes via PEO side chain length: Impact on alkaline water electrolysis performance

Authors: Sara Gjoshi, Charalampos Anastasopoulos, Kamal Ghotia (DLR), Davide Grilli (DLR), Franz Egert (DLR), Syed Asif Ansar (DLR), Fatemeh Razmjooei (DLR), Valadoula Deimede

Journal: Journal of Membrane Science, Elsevier, 2025, Volume 773, no. 124368

Access: Open access - check it out HERE!

2.5 PEACE PROJECT ON THE CONFERENCE STAGE

The PEACE team had a busy summer, filled with both research progress and outreach activities. **Disseminating PEACE results** within the scientific and research community remains one of the project's key communication priorities.

Recently, the PEACE project was represented at:

• Water Electrolysis Gordon Research Conference - Waterville Valley (US)

• Fifth International Conference on Electrolysis (ICE 2025) - Freiburg (DE)

• 76th Annual Meeting of the International Society of Electrochemistry - Mainz (DE)

The PEACE team has also been active in **academic lecturing**. At TU/e, the new academic brought the opportunity to inform and inspire students within the **Chemical Engineering MSc curriculum** using the latest knowledge from PEACE on alkaline water electrolysis technology.

Furthermore, **Dr. Paola Granados Mendoza (HyCC)** represented PEACE at the **10th European Summer School on Electrochemical Engineering (ESSEE)**, where she delivered lectures on the industrial implementation of green hydrogen. Her sessions highlighted how PEACE's research on highly pressurized alkaline electrolysis supports the development of a competitive and sustainable hydrogen economy in Europe.

3. Hydrogen News

3.1.GERMANY LAUNCHES SECOND GLOBAL HYDROGEN FUNDING ROUND

Germany's Federal Ministries for Economic Affairs and for Research have announced a second **international funding call** to support **renewable hydrogen** and derivative projects outside the European Economic Area and Switzerland. Building on the 2021 guidelines, the new scheme aims to strengthen Germany's global hydrogen partnerships and create opportunities for German companies in this strategic sector.

The initiative comprises two funding modules: Module 1 (managed by the Ministry for Economic Affairs) supporting construction of renewable hydrogen and derivative production facilities abroad, as well as preparatory scientific studies; Module 2 (led by the Ministry for Research), supporting R&I, industrial trials, and training programmes directly linked to Module 1 projects overseas.

Source of the news

3.2 CLEAN HYDROGEN PARTNERSHIP 2025 CALL: EVALUATION RESULTS

In April 2025, the Clean Hydrogen Partnership (CHP) closed its 2025 Horizon Europe call, offering grants worth €184.5 million. The **call attracted 212 proposals** (see Newsletter No. 6), representing a 40% increase compared to 2024 call.

An overview of evaluation results, published in August, showed that over 67% of proposals scored above the quality threshold.Total budget requested for all these above-threshold proposals stands at some €778 million, which, compared to the grants available, suggests that the call was **highly competitive**. Ultimately, only **24 projects were selected for funding**.

The **highest competition** was observed in the **renewable hydrogen field**, particularly in topics 01-05: Innovative co-electrolysis systems and integration with downstream processes and 01-07: Towards exploration and evaluation of European natural hydrogen potential, both requiring 15 points to reach the funding threshold. High funding threshold (14 points) was also reported for the topic Hydrogen End Uses: Clean Heat and Power.

Source of the news

4. Hydrogen Events

EU Hydrogen Research and Innovation Days, 24-25 November, 2025, Brussels (BE)

A high-visibility platform for policymakers, researchers, and stakeholders to assess progress and achievements across the pillars of the Clean Hydrogen programme and to discuss future priorities and key issues for research and innovation in the clean hydrogen field.

Event link

Madrid Electrolyser Conference, 25-26 November, 2025, Madrid (ES)

The 9th edition of the flagship event in industrial electrolysis moves from its traditional home in Berlin to Madrid. An exploration on the latest advances in the development, manufacturing, and deployment of next-generation industrial electrolysers will be on display.

Event link

Hyvolution Paris, 27-29 January, 2026, Paris (FR)

Discussions addressing the key challenges of the hydrogen sector will be held at the main stage, covering the topics of H2 & derivates, carbon capture & management, H2 for mobility, H2 industrial applications, H2 infrastructure, and optimization & sector coupling. Several workshops are to be organised and large exhibition arena ready to show the latest innovations in the hydrogen market.

Event link

5. Hydrogen Project Funding Opportunities

A sustainable and green rail system

A forthcoming innovation action (HORIZON-JU-ER-2025-FA4-01) will fund **one flagship project** (budget: €26.6 million) to deliver solutions to energy and CO_2 savings in the rail system and support a resilient rail, leading to a healthier, safer and more attractive railway system. The selected project, to be completed by 2028, will deliver complex innovative solutions, amongst others also in hydrogen-related areas, including hydrogen hybrid trains (TRL7) and universal hydrogen refuelling interface & digital algorithms to improve refuelling efficiency (TRL6/7).

Opening date: 30 October, 2025
Submission date: 11 February, 2026

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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.**

PEACE PROJECT MEMBERS

DLR Deutsches Zentrum für Luft- und Raumfahrt German Aerospace Center

MaterialsM Instruments

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

b-tu Brandenburg University of Technology Cottbus - Senftenberg

HyCC

GRANT GARANT

DTU

Clean Hydrogen Partnership

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