

All4Zero presents 12 technological solutions to drive the decarbonization of industry

- **The hub, founded by ArcelorMittal, Holcim, Iberia and Repsol, has selected technologies with high potential related to water resource management, renewable hydrogen production, CO2 capture and use, waste management or the use of renewable fuels, with the aim of promoting their development and implementation in industry.**
- **The chosen solutions, from a total of 186 proposals received, provide a disruptive vision and represent a breakthrough in transforming the industry.**
- **The technologies have been devised in startups and technology centers in Spain, the United States, the United Kingdom and France and will be tested and developed in the laboratories and industrial facilities of All4Zero members.**
- **Scientists and experts at the hub have assessed the efficiency or circularity of proposals such as wastewater desalination, the use of CO2 in the production of efuels, the use of AI to drive the circular economy or the use of algae to generate renewable fuels.**
- **All4Zero thus reaffirms its commitment to the decarbonization of the industry and the goal of achieving net zero emissions by 2050.**

Madrid, June 20, 2024 - [All4Zero](#), the industrial technology innovation hub founded by [ArcelorMittal](#), [Holcim](#), [Iberia](#) and [Repsol](#), has presented the **12 technological solutions** it has selected to contribute to the reduction of emissions and the promotion of a circular economy, thus accelerating the transition to a more sustainable and decarbonized model of industry.

The hub has chosen several solutions for each of the five proposed challenges: water resources management, renewable hydrogen production, CO2 capture and use, waste management or the production of PBS and other renewable fuels, launched in its first call, to which 186 proposals were submitted.

The level of the technologies presented has been very relevant, since all of them provide a disruptive vision and represent a breakthrough to transform the industry. This has led the scientists and experts who have evaluated the proposals to increase the number of proposals selected, despite the initial announcement of the commitment to work with a maximum of ten.

The technology solutions selected come from startups and technology centers in Spain, the United States, the United Kingdom and France, reflecting the hub's capacity to promote and energize the innovation ecosystem and its international projection. Nine of the 12 technology solutions selected are Spanish, specifically from Catalonia, the Basque Country, Valencia, Aragon and Madrid.

The presentation took place during the **Tech Solutions Day** event, held at Repsol Technology Lab, the multi-energy company's innovation center in Madrid, where attendees were able to learn first-hand about the process of selecting the solutions and what each of them contributes to meeting **All4Zero's** objective with this initiative.

In addition to the scientists and technicians of the hub and those responsible for the solutions presented, the event was also attended by **Teresa Riesgo, Secretary General for Innovation of the Ministry of Science, Innovation and Universities, and Vicente Parras, Deputy Director General of Technological Innovation of the Community of Madrid**. During their speeches, both highlighted the importance of public-private collaboration to promote innovation and development in industry towards a more sustainable model, and pointed out that initiatives such as **All4Zero** are "vital" for the growth, development and implementation of new technologies, especially because of their focus on a key sector for progress, such as industry.

After weeks of analysis and study, the hub's technicians and specialists have selected the technological solutions according to the challenge to which they respond.

Challenge 1.- Efficient carbon capture and emissions reduction. All4Zero was looking for technological solutions that contribute to advance in the solution for CO₂ emissions that cannot be abated by other means and that are ready to be integrated into industrial production processes. The solutions chosen were:

- **Yama (France):** Electrochemical hybrid direct air capture (DAC) technology reduces energy consumption by 73%.
- **Tecnalia (Madrid, Spain):** Development of membranes for CO₂ capture, reducing energy consumption.

Challenge 2.- Securing water resources. The hub has valued technologies that optimize the use of water in industrial processes, promoting efficiency and circularity, as well as solutions for the recovery of water resources, water harvesting and water management. The solutions chosen were:

- **Eurecat (Barcelona, Spain):** Innovative industrial wastewater desalination method for maximum water recovery.
- **Teqma (Barcelona, Spain):** Compact wastewater filtration and disinfection system for irrigation, industry and aquifer recharge.

Challenge 3.- To boost efficiency in the production of renewable hydrogen. All4Zero sought in its open call technological solutions for the development of advanced electrolysis processes and other technologies for obtaining renewable hydrogen, as well as options to facilitate the transport and storage of this hydrogen safely. In this sense, the selected solutions have been:

- **Power H₂ (USA):** Electrolysis technology developed with NASA, producing hydrogen at a 35% lower cost.

- **Jolt (Barcelona, Spain):** Development of self-supporting industrial electrodes for renewable hydrogen, reducing costs and increasing durability.
- **Electrogenos (United Kingdom):** Alkaline electrolysis for efficient production of renewable hydrogen, reducing costs and installation time.

Challenge 4.- Generation of PBS and other renewable fuels and CO2 mineralization. The different uses that can be given to CO2 is one of the objectives pursued by the hub with the launch of this challenge with dual application. Therefore, they were looking for disruptive technologies to convert captured CO2 into new materials that can be used as raw materials in industrial processes, the production of SAF (Sustainable Aviation Fuel) and other renewable fuels for transportation. In this fourth challenge, the selected solutions were:

- **Aimplas (Valencia, Spain):** Conversion of CO2 to renewable aviation fuels by electroconversion to ethylene.
- **Macrocarbon (Gran Canaria, Spain):** Use of marine algae to absorb carbon and produce sustainable hydrocarbons and biochar.
- **SBS (Vizcaya, Spain):** CO2 capture and mineralization technology to reduce emissions and promote the use of industrial waste.
- **Eurecat (Barcelona, Spain):** CO2 and industrial waste mineralization process to obtain advanced materials.

Challenge 5.- Use of materials from waste. This challenge seeks solutions to reduce the waste that ends up in landfills and, therefore, contributes to the emission of greenhouse gases (GHG), since a large amount of this waste has a high potential and can be reintroduced into the production chain, thus promoting circularity. Following the experts' analysis, the solution chosen was:

- **CIRCE (Zaragoza, Spain):** Use of AI to optimize waste management and increase the incorporation of alternative fuels and raw materials.

All4Zero will drive these technologies and define the proof-of-concepts (PoC), which can be carried out in the laboratories and industrial facilities of the hub partners by expert technologists and scientists from leading industrial companies.

This project reaffirms **All4Zero's** commitment to industrial transformation and decarbonization, driving innovation and collaboration between startups, research centers and universities globally to accelerate the achievement of net zero emissions by 2050.

Partners and collaborators that add up

This new advance of **All4Zero** has had the support of all the companies and entities involved in the project: **Enagás, Aitex, Exolum, Hijos de Rivera, Sacyr, Técnicas Reunidas, Urbaser, Magna and Airbus, recently incorporated.** Also present were all the hub's collaborators: **Tecnalia, IMDEA Energía, the Iberian Energy Storage Research Center (CIIE), the National**

Renewable Energy Center (CENER), the Spanish National Research Council (CSIC), Eurecat and Idonial.

About All4Zero

All4Zero is a private, multi-sector and non-profit industrial technology innovation hub, unique in Spain, driven by ArcelorMittal, Holcim, Iberia and Repsol, leading companies in different sectors, which have joined forces in this pioneering initiative, motivated by a common goal: to accelerate the development of disruptive technologies and projects that contribute to decarbonization and the circular economy.

More Information

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