

6th Issue,  
December 2024

# H4D Review



## Dear H4D Partners and Stakeholders:

The World Bank team is pleased to announce the release of the sixth quarterly newsletter, H4D Review. This publication aims to provide H4D's partners, stakeholders, and observers with up-to-date information on ongoing activities, analytical work, and forthcoming events related to clean and low-carbon hydrogen.

### List of H4D Partners

The Hydrogen for Development Partnership (H4D) has 49 partners, including associations, business organizations, hydrogen clusters, knowledge institutions, laboratories, public agencies, and development institutions. List of H4D Partners (status December 17, 2024):

- ✓ Africa Green Hydrogen Alliance (AGHA)
- ✓ Ammonia Energy Association (AEA)
- ✓ Australian Hydrogen Council (AHC)
- ✓ Centre for Hydrogen Energy Systems Sweden (CH2ESS)
- ✓ Chilean Hydrogen Association (H2Chile)
- ✓ Clean Fuel Ammonia Association
- ✓ Corporation for the Promotion of Production (CORFO)
- ✓ Costa Rican Hydrogen Alliance
- ✓ Development Agency of the State of Ceara (ADECE)
- ✓ Dii Desert Energy
- ✓ Electricity Commercialization Chamber of Brazil (CCEE)
- ✓ Freeport Saldanha
- ✓ Fuel Cell and Hydrogen Energy Association (FCHEA)
- ✓ Gas Regulatory Authority (GASREG)
- ✓ German Development Cooperation Agency (GIZ)
- ✓ Green Hydrogen Catapult
- ✓ Green Hydrogen Organisation (GH2)
- ✓ Green Hydrogen India (GH2 India)
- ✓ H2 Global Foundation
- ✓ H2 Korea
- ✓ H2 Mexico
- ✓ H2AR Consortium
- ✓ H2LAC
- ✓ Hydrogen Colombia Association (H2Colombia)
- ✓ Hydrogen Council
- ✓ Hydrogen Egypt
- ✓ Hydrogen Europe
- ✓ Hydrogen Task Force
- ✓ India Hydrogen Alliance (IH2A)
- ✓ International Finance Corporation (IFC)
- ✓ International Hydrogen Fuel Cell Association (IHCFA)
- ✓ Japan Bank for International Cooperation (JBIC)
- ✓ Japan Hydrogen Association (JH2A)
- ✓ Ministry of Energy and Mineral Resources of Jordan
- ✓ Ministry of Foreign Affairs of The Netherlands (MINBUZA)
- ✓ Moroccan Agency for Sustainable Energy (MASEN)
- ✓ Namibia Green Hydrogen Programme (GH2 Namibia)
- ✓ National Administration of Fuels, Alcohol, and Portland (ANCAP)
- ✓ National Renewable Energy Laboratory (NREL)
- ✓ Netherlands Enterprise Agency (RVO)
- ✓ Organization for Economic Co-Operation and Development (OECD)
- ✓ Pecem Complex (PECEM)
- ✓ Peruvian Hydrogen Association (H2Perú)
- ✓ Petroleum Development Authority of Sri Lanka (PDASL)
- ✓ Research Institutes of Sweden (RISE)
- ✓ Rocky Mountain Institute (RMI)
- ✓ State Renewable Energy Agency of Nuevo León
- ✓ Western Cape Government
- ✓ World Bank (WB)

The H4D team is delighted to welcome its new partners: the International Hydrogen Fuel Cell Association (**IHCFA**), the **State Renewable Energy Agency of Nuevo León**, the Gas Regulatory Authority (**GASREG**) and the Green Hydrogen India (**GH2 India**). These esteemed institutions have joined the initiative between September and December 2024.

# Achievements in 2024



IN  
FACTS  
DURING 2024



One additional  
workstream  
launched:  
**Hydrogen use  
in industry**



Growth in  
number of  
partners  
**from  
38 to 49**



1 in-person  
meeting in  
**Colombia**



**One report  
and  
One navigator**  
published in  
collaboration  
with partners



9 webinars  
organized in  
**collaboration  
with 10  
partners**

# Operationalizing H4D Partnership

On October 23rd, the H4D Partnership successfully held its third online meeting of the year. The session featured comprehensive updates on the progress across all active workstreams and introduced the new **Workstream (WS5) “Hydrogen use in industry”**. Over 30 partners participated in the session, highlighting the collaborative effort and commitment to advancing hydrogen development.

## H4D workstreams

**WS1. Clean hydrogen technologies, infrastructure, and systems integration.**  
**Facilitated by:**



Herman Jonker  
Co-chair  




Mike Enskat  
Co-chair  




Hiroaki Machii  




Rafael Ben  


**WS2. Enabling frameworks (policies, laws, regulations, and institutional capacities).**  
**Facilitated by:**



Mikaa Mirald  
Co-chair  




Ricardo Gedra  
Co-chair  




Carolina Lopez Rocha  




Carmen Conde  
Pardavila  


**WS3. Investments, financing, business models and procurement.**  
**Facilitated by:**



Deger Saygin  
Co-chair  




Dolf Gielen  




Michelle Carvalho  
Metanias Hallack  


**WS4. Socioeconomics and sustainability.**  
**Facilitated by:**



Simran Sinha  
Co-chair  




Monica Gasca  
Co-chair  




Carolina Lopez Rocha  




Ignacio Berreta Sartini  


**New**  
**WS5. Hydrogen use in industry.**  
**Facilitated by:**



Ana María Ruz  
Co-chair  



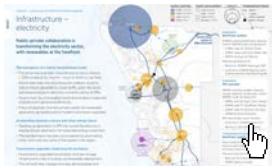

Dolf Gielen  




Megan Meyer  




# Key Highlights



## AEA | Namibia Green Industrialisation Blueprint

Namibia launched its Green Industrialisation Blueprint, outlining a strategic plan to leverage its vast solar and wind resources. This initiative aimed to develop a thriving green hydrogen industry, attracting investment and creating thousands of skilled jobs. The blueprint emphasized Namibia's strategic location and stable political climate as key advantages. It highlighted the potential for green hydrogen to drive economic transformation and support global decarbonization efforts.



## CCEE | The Chamber of Electric Energy Commercialization (CCEE) launches Brazilian platform for renewable energy certification

CCEE launched a national platform for renewable energy certification. This initiative aimed to strengthen the market for Renewable Energy Certificates (RECs) and attract investments from companies committed to environmental sustainability. The platform centralized data from all generating plants and certification issuers in the country, ensuring the integrity and traceability of the energy's origin. The CCEE's efforts were particularly significant for the hydrogen sector, as reliable certification supports the integration of hydrogen solutions into the broader energy transition.



## GH2 India | High-level roundtable on "Navigating Certification and Regulatory Challenges for Green Hydrogen from India"

During European Hydrogen Week, GH2 India participated among other Indian stakeholders and the European Union at the Certification Roundtable. The discussion focused on the Renewable Fuels of Non-Biological Origin (RFNBO) standards under the EU's Renewable Energy Directive (RED) and the pathways to align India's burgeoning green hydrogen industry with these requirements.



## GH2O | Green Hydrogen Organisation helps convene open letter to stimulate additional demand for low- and near-zero-carbon materials, chemicals and fuels including those made with green hydrogen

GH2 helped to convene the Industrial Transition Accelerator's open letter urging all governments to strengthen their policy frameworks between COP29 and COP30 to stimulate additional demand for low- and near-zero-carbon materials, chemicals and fuels including those made with green hydrogen.



## H2COLOMBIA | Moving towards a sustainable future: Hydrogen certification in Colombia

H2 Colombia conducted an analysis for the implementation of renewable energy certifications. This initiative aimed to establish a robust certification framework to ensure the credibility and traceability of renewable energy sources. The analysis focused on identifying best practices and regulatory trends to support the hydrogen sector. By implementing these certifications, H2 Colombia sought to enhance investor confidence and promote the adoption of green hydrogen technologies.



## H2LAC | Uruguay and the European Union jointly promote the advancement of green hydrogen

Uruguay and the European Union jointly advanced green hydrogen development by signing a declaration of intent. This agreement, formalized during the V European Investment Forum in Uruguay, included a €2 million grant from the EU to strengthen Uruguay's green hydrogen sector. The initiative aimed to update regulatory frameworks, support public engagement, and enhance infrastructure. Uruguay's Green Hydrogen Roadmap projected a \$18 billion investment by 2040, creating over 30,000 jobs.



## H2PERU | H2 Peru and the Netherlands: A key partnership for the development of renewable hydrogen

H2 Perú and the Netherlands signed a Memorandum of Understanding (MoU) to promote renewable hydrogen development in Peru. This agreement aimed to foster a favorable environment for hydrogen implementation and export to Europe. The MoU focused on exchanging best practices, regulatory trends, and technological innovation. It also emphasized creating dialogue spaces among public, private, and academic sectors to position hydrogen as a key energy vector.



## HYDROGEN EUROPE | Hydrogen Europe signed a Memorandum of Understanding (MoU) with GH2 India and with the Chilean Hydrogen Association

During the European Hydrogen Week, Hydrogen Europe signed a MoU with GH2 India and with the Chilean Hydrogen Association (H2 Chile). These agreements aim to foster collaboration and mutual support, enhancing knowledge exchange to advance the hydrogen sector.



## IH2A | Industry Whitepaper

The IH2A released a comprehensive market assessment for hydrogen derivatives and low-carbon fuels for 2025-2030. The report highlighted the anticipated growth in green hydrogen projects, focusing on heavy-duty transport sectors such as long-haul trucking, shipping, and aviation. Key projections included the production of 194 million liters of green methanol and 263 million liters of green ammonia for shipping and trucking. Additionally, the assessment estimated the use of 19,500 kilograms of hydrogen for trucking and 15-45 million liters of sustainable aviation fuel.



## JBIC | JBIC Signs MOU with Morocco

JBIC signed a Memorandum of Understanding (MOU) with Morocco's Ministry of Energy Transition and Sustainable Development during COP29 in Azerbaijan. This MOU aimed to strengthen collaboration in energy transition and sustainable development, focusing on renewable energy, decarbonization of industrial supply chains, and energy efficiency. Significantly, it emphasized developing international integrated hydrogen and ammonia supply chains, aligning with global efforts to promote green hydrogen as a sustainable energy source.



## PECEM | World Bank allocates \$9 million to boost Pecém Verde energy transition program

The World Bank allocated \$9 million from the Livable Planet Fund to support the Pecém Verde Energy Transition Program. This initiative focused on the implementation of a clean hydrogen project in the Pecém complex. The funding aimed to reduce the costs associated with this strategic initiative, which was designed to accelerate the transition to a cleaner energy matrix. Total financing for Pecém Verde was estimated at \$175 million over five years, combining loans and grants from various international institutions.



## RMI | Stakeholders Across Maritime Value Chain Align to Accelerate Adoption of Zero-Emission Fuels by 2030 for a Sustainable Shipping Future

More than 50 maritime industry leaders signed a Call to Action at COP 29 to accelerate the adoption of zero-emission fuels by 2030. Organized by RMI and other partners, the statement aims to increase the use of low-emission fuels, investment in zero-emissions vessels, and development of global green hydrogen infrastructure.

# A New Milestone for Clean Energy at COP29

## Joint DFI Communiqué: Supporting the 10 GW Renewable Hydrogen Lighthouse Initiative

On November 14 at COP29, the World Bank Group, in collaboration with 10 leading international development finance institutions, launched the transformative 10GW Lighthouse Initiative at a roundtable hosted by the Breakthrough Agenda and moderated by the Hydrogen Council.

This ambitious initiative is designed to accelerate the development of renewable hydrogen projects, with a capacity ranging from 100 MW to 1 GW, across emerging markets and developing countries (EMDCs). The objective is to reach Final Investment Decisions (FID) by 2030, which will be a pivotal step in driving global decarbonization, energy transition, and sustainable economic growth.

By prioritizing practical and scalable solutions, the 10GW Lighthouse Initiative positions renewable hydrogen as a cornerstone of the green transition. It demonstrates the importance of collaboration between the public and private sectors in enabling EMDCs to lead the charge toward a net-zero future.



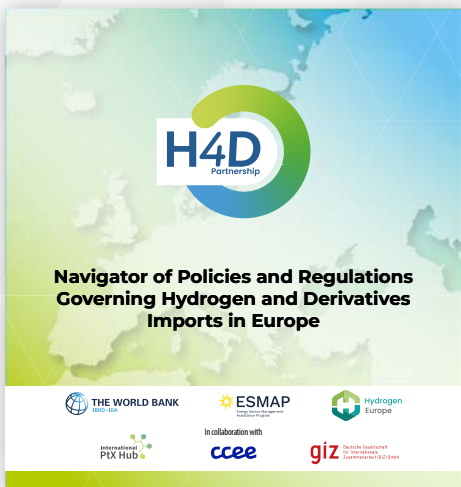
# Launch of H4D’s Navigator of H2 imports at the European Hydrogen Week

## Navigator of Policies and Regulations Governing Hydrogen and Derivatives Imports in Europe

On November 19, during European Hydrogen Week, the World Bank, ESMAP and Hydrogen Europe launched the Navigator of Policies and Regulations Governing Hydrogen and Derivatives Imports in Europe. This collaborative effort, in partnership with the International Power-to-X Hub, GIZ, and CCEE under the H4D Partnership, aimed to streamline the process for imports of hydrogen into Europe.

The Navigator served as a comprehensive guide to the policies and regulations governing the import of hydrogen and its derivatives into Europe. It provided consolidated insights and direct links to key resources, making it a one-stop-shop for exporting countries seeking to comply with European regulations and investors seeking clarity on market opportunities.

The official launch included a dynamic roundtable discussion with exporters and H4D Partnership partners, highlighting the importance of clear guidance in developing a global hydrogen market. The Navigator was the first in a series of tools designed to map the regulatory landscape for hydrogen imports in different regions of the world.




Download the Navigator

# OECD and World Bank Report: Mitigating Risks to Unlock Global Clean H2 Investments

## Report: Leveraging De-Risking Instruments and International Co-ordination to Catalyse Investment in Clean Hydrogen

On December 17, the OECD, in collaboration with the World Bank, released a pivotal report titled "Leveraging De-risking Instruments and International Co-ordination to Catalyse Investment in Clean Hydrogen." The report identifies significant financial and market barriers that currently impede the growth of the clean hydrogen sector. Additionally, the report emphasizes the importance of global collaboration in establishing common standards and sharing best practices.

**The report highlights:**

- How de-risking instruments can address key barriers faced by investors in clean hydrogen projects.
- The methods to allocate risks among actors.
- Viable actions to enhance international co-ordination for scaling clean hydrogen financing for development.




Read the full report


View the infographic



# Latest events and presentations by World Bank and H4D Partners

## MEDIA

### ESMAP Webinar Global Trade in Green Hydrogen Derivatives: Trends in Regulation, Standardization and Certification

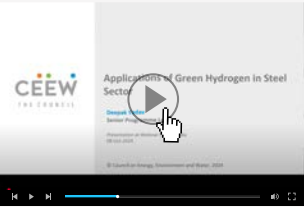


IRENA presented the latest update of its global green hydrogen standards and certification report. In this session, participants learned about the regulatory development for hydrogen and its derivatives in first mover markets and received recommendations for policy approaches to support international harmonization.

### ESMAP Webinar Charting the course: strategies for ports to supply zero-emission fuels



World Bank staff and RMI experts discussed different strategies for ports in EMDCs to become early adopters in offering green methanol and ammonia bunkering services. The discussion also highlighted how the emerging market for zero-emission fuels presents a unique opportunity for developing countries to position themselves as key players in the green maritime fuel industry, driving economic growth while supporting global sustainability goals.



### GH2 India Webinar: Green Hydrogen Application in the Steel Sector

India's steel sector, accounting for 12% of the country's CO2 emissions, stands at the forefront of the decarbonization challenge. This session showcased the transformative potential of green hydrogen to reduce emissions by over 90% in Direct Reduced Iron (DRI) processes. Participants learned about advancements in hydrogen-based steel making, its cost implications, and its role in helping India achieve its net-zero target by 2070.

## EVENTS RECAP



### Clean Energy Ministerial 15/Mission Innovation 9 and G20 Meetings [September 30 – October 4, 2024, Foz do Iguaçu, Brazil, In-person].

Brazil hosted one of the year's largest clean energy events, convening the Clean Energy Ministerial and Mission Innovation communities with the G20 Energy Ministers to put forward an action-focused agenda to accelerate the global clean energy transition.

The Hydrogen Council was present at the event to meet government officials, the COP29 presidency, and international partners, as well as to co-host the third International Hydrogen Trade Forum. The forum's focus was on three key areas: access to finance, demand creation, and certification.



### 14th Dii Desert Energy Leadership Summit [October 15-16, 2024, Vienna, Austria, In-person].

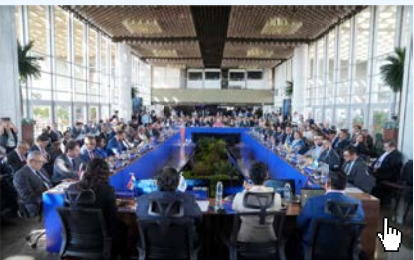
The summit brought together the leaders of the energy transition and provided a forum to discuss and address critical challenges, issues, and progress in clean energy initiatives. The World Bank team representatives had the opportunity to engage in discussions on innovative financing schemes and mechanisms for H2 production, transport, and offtake and moderate a discussion on the role of critical minerals in clean energy technologies with experts from the Middle East and North Africa (MENA) region.



### OECD Forum on Green Finance and Investment 2024 [October 15-16, 2024, Paris, France, In-person].

Under the theme "*Shifting the financial system and strengthening enabling environments to mobilize trillions*", this year's edition brought together leading actors from the green and sustainable finance and investment community to promote effective engagement, collaboration and action on green finance and investment.

The meeting highlighted the need for substantial capital investment to achieve global climate objectives, emphasising the importance of international collaboration and supportive policy frameworks. Focused particularly relevant to the hydrogen sector, as scaling up clean hydrogen technologies requires significant investment and coordinated efforts to integrate hydrogen solutions into the broader energy transition.



### IX Energy Week [October 28 – November 1, 2024, Asuncion, Paraguay, In-person].

The Energy Hydrogen Week promoted collaboration between governments, companies, academia, and international agencies to innovate and advance equity in the energy sector. Key topics included renewable energy, advanced strategies for energy transitions ('transitions 2.0'), gender equality, and energy adaptation. Representatives from the 27 OLADE Member Countries, along with key public and private sector leaders in energy, participated in the event.

The forum's focus on next-generation fuels and decarbonization was particularly relevant for the development and deployment of hydrogen in emerging markets and developing countries (EMDCs). By fostering collaboration and knowledge exchange, this regional event aimed to promote sustainable growth and energy security.



### European Hydrogen Week [November 18-22, 2024, Brussels, Belgium, In-person].

Hydrogen Europe, the European Commission, and the Clean Hydrogen Partnership joined forces to unite the entire hydrogen sector for an exceptional week of conferences, exhibitions, and unparalleled networking opportunities.

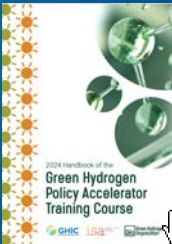
The conference streams featured dynamic panels with leading stakeholders from across the hydrogen industry, addressing the most critical topics shaping this emerging sector: the urgent yet pragmatic need for a robust regulatory framework, the unique decarbonization challenges faced by various industries, and hydrogen's pivotal role in overcoming them. Discussions also explored strategies to maintain leadership in a field that is rapidly gaining global attention.

In the exhibition hall, attendees had the opportunity to engage with cutting-edge innovations, including the latest advancements in electrolyser and fuel cell technologies, showcasing the tangible progress driving the hydrogen economy forward.

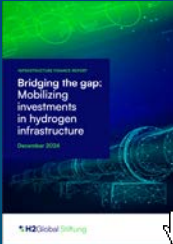
Selected publications and articles on clean hydrogen from H4D Partners



Liquid hydrogen - powering the energy transition [White paper] - **Dii Desert Energy**



2024 Handbook of the Green Hydrogen Policy Accelerator Training Course [Publication] - **Green Hydrogen Organisation**



Bridging the gap: Mobilizing investments in hydrogen infrastructure [Report] - **H2Global**



Keep it simple: Aligning auction objectives for success [Report] - **H2Global**



Unlocking potential: Scaling demand through hydrogen hubs [Report] - **H2Global**



Clean Hydrogen Monitor 2024 [Report] - **Hydrogen Europe**



Green Hydrogen Economy Insight [Report] - **IHFCA**



Assessing a Louisiana-Japan Green Dry Bulk Corridor [Report] - **RMI and Green Hydrogen Catapult**

Major hydrogen project financing updates in the news



The European Commission opened the second auction under the European Hydrogen Bank (EHB), planned to allocate €1.2 billion to support renewable hydrogen production projects in the European Economic Area. [Link](#)



Brazil’s majority state-controlled oil and gas company, Petrobras, announced the launch of its first pilot green hydrogen plant in the first quarter of 2026, following an investment of \$16.1 million. [Link](#)



Colombia’s majority state-owned oil and gas company, Ecopetrol, announced its plans to build a new green hydrogen plant at its refinery in the Caribbean city of Cartagena for around \$28.5 million. [Link](#)



The European Climate, Infrastructure and Environment Executive Agency (CINEA) received 74 project proposals requested approximately €4 billion of funding for works and studies of cross-border infrastructure projects under the Connecting Europe Facility for Energy (CEF Energy). [Link](#)



UAE-Moroccan private venture announced an investment of \$25 billion in a green hydrogen and ammonia project in the Atlantic Port of Dakhla, with government approvals already granted. [Link](#)



India approved three pilot projects of steel production under the National Green Hydrogen Mission, which received about \$40 million to be commissioned in the next 3 years. [Link](#)

Upcoming WB and H4D Partners activities



Hyvolution Paris  
January 28–30, 2025 | Paris, France, In-person.



5th American Hydrogen Forum  
February 12–13, 2025 | Houston, United States, in-person.



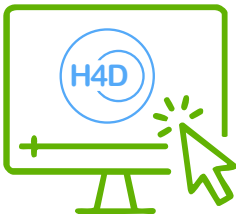
H2Global Stakeholder Engagement Workshop  
February 20, 2025 | Cape Town, South Africa, in-person.



4th International Hydrogen Congress  
April 1–2, 2025 |Bogota, Colombia, In-person.



India Green Hydrogen Assembly (IHGA) 2025  
April 7–9, 2025 | Gandhinagar, Gujarat, India, In-person.



Upcoming H4D Webinars:

- February 11, 2025, 9 am (ET): OECD - World Bank Joint Report “Leveraging De-Risking Instruments and International Co-ordination to Catalyse Investment in Clean Hydrogen”
- March 18, 2025, 9 am (ET): Electric Grid Integration
- April 15, 2025, 9 am (ET): Presentation of the Navigator of Policies and Regulations Governing Hydrogen and Derivatives Imports in Europe.