



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



GLOBAL PROGRAMME
HYDROGEN IN INDUSTRY

GLOBAL PROGRAMME FOR HYDROGEN IN INDUSTRY

Driving net zero industrial development and wealth generation in developing countries



A HYDROGEN ECONOMY:

OPPORTUNITIES FOR DEVELOPING COUNTRIES

Produced from renewable energy sources, green hydrogen (GH₂), also known as renewable hydrogen, is the fuel of the future. It is clean, storable and portable, and can be blended into existing energy networks and integrated with current infrastructure. Green hydrogen and low-carbon hydrogen[1] are key to decarbonization of hard-to-abate industries such as steel production, cement, chemicals and heavy transport, which together account for 30 per cent of global CO₂ emissions. In short, hydrogen can help countries around the world achieve their climate goals.

[1] Hydrogen derived from non-renewable sources, and that meets a greenhouse gas emission reduction threshold of 70% compared to fossil-based hydrogen.



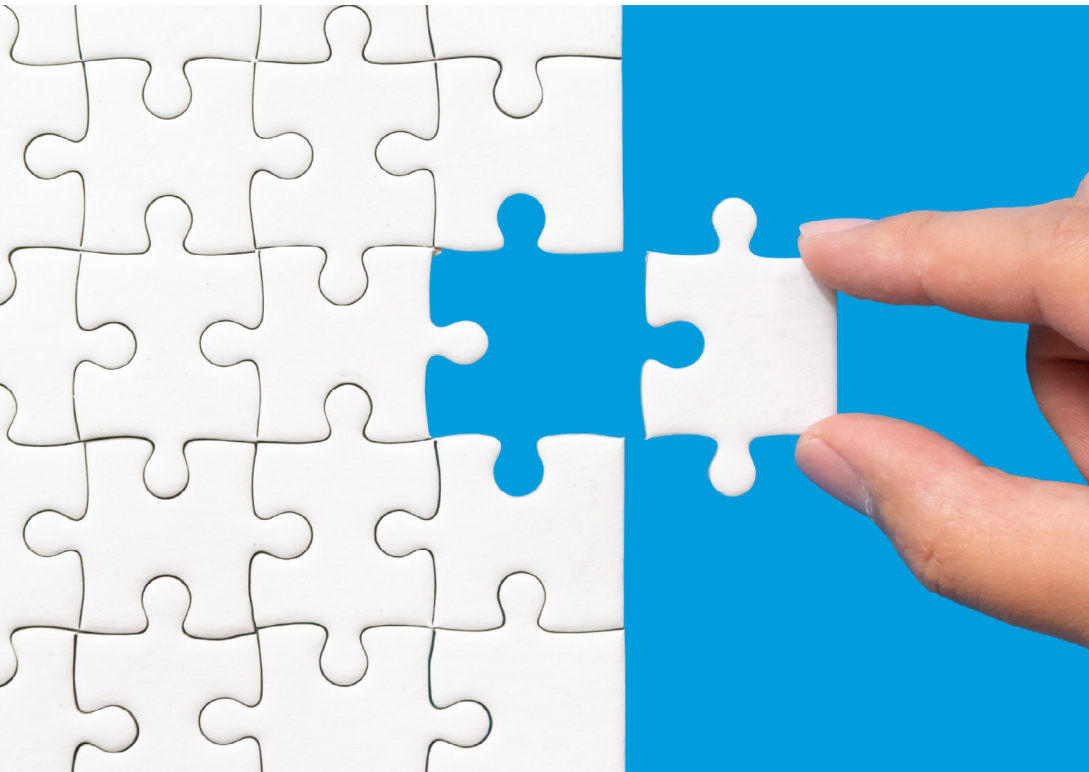
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Melting point: -259.14°C
Boiling point: -252.87°C
HYDROGEN
Latin name: *Hydrogenium*

Green hydrogen offers unique opportunities for net zero industrial development in developing countries with abundant renewable power potential. It can pave the way for job creation, skills upgrading, investment mobilization, energy security and participation in global hydrogen trade. Green hydrogen can reinforce developing countries' overall resilience and drive a diversified and knowledge-based economy. Many countries with an already existing gas infrastructure can pursue the goals of net-zero industrialisation through the concurrent application of low carbon hydrogen and green hydrogen.

CHALLENGES

HINDERING THE POTENTIAL OF HYDROGEN

Several obstacles currently hinder developing countries and transition economies from creating a sustainable hydrogen economy, i.e. absence of a domestic green hydrogen market and the necessary infrastructure as well as lack of access to global trade. This prevents them from taking advantage of the opportunities which hydrogen offers.



The most serious challenges for developing countries are a lack of:

- **Conducive policies and regulations** for promoting a hydrogen ecosystem to underpin investor and market confidence and accelerate hydrogen projects that create social and environmental benefits;
- **Appropriate standards and quality infrastructure** to facilitate global trade and drive the offtake of green hydrogen and low carbon hydrogen;
- **Financial instruments** to incentivise investments in hydrogen and renewable energy projects;
- **Skills and know-how** to boost resilient and sustainable industrialization based on green hydrogen;
- **Accessible and affordable innovation** of hydrogen technology, systems, equipment and infrastructure;
- **Co-ordination between key stakeholders** at the national, regional and global level to effectively resolve the bottlenecks identified.

To avoid the risk of lagging behind in the energy transition, developing countries need to tackle these challenges.

PROVIDING SOLUTIONS:

GLOBAL PROGRAMME FOR HYDROGEN IN INDUSTRY

UNIDO launched its Global Programme for Hydrogen in Industry (GPHI) to support developing countries overcome identified barriers and encourage a just hydrogen transition that puts social and environmental aspects in focus. Through its Programme, UNIDO aims to influence and guide the development of market policies, standards, skills, financing instruments, innovation and coordination between key stakeholders that play an essential role in the development of a just and sustainable hydrogen economy. Promoting tangible projects to accelerate the local uptake of green hydrogen in industries of developing countries and transition economies is a key element of the Programme.

WHAT ARE OUR KEY AREAS OF INTERVENTION?



Policies



Standards



Financial instruments



Skills



Innovation



Coordination



EXAMPLES:

In Costa Rica

- ▶ Capacity- development in competencies and technical skills for a green hydrogen economy;

In Egypt

- ▶ Technical assessments to identify local industries' potential demand for clean hydrogen in view of creating a domestic market for green hydrogen;

In Morocco

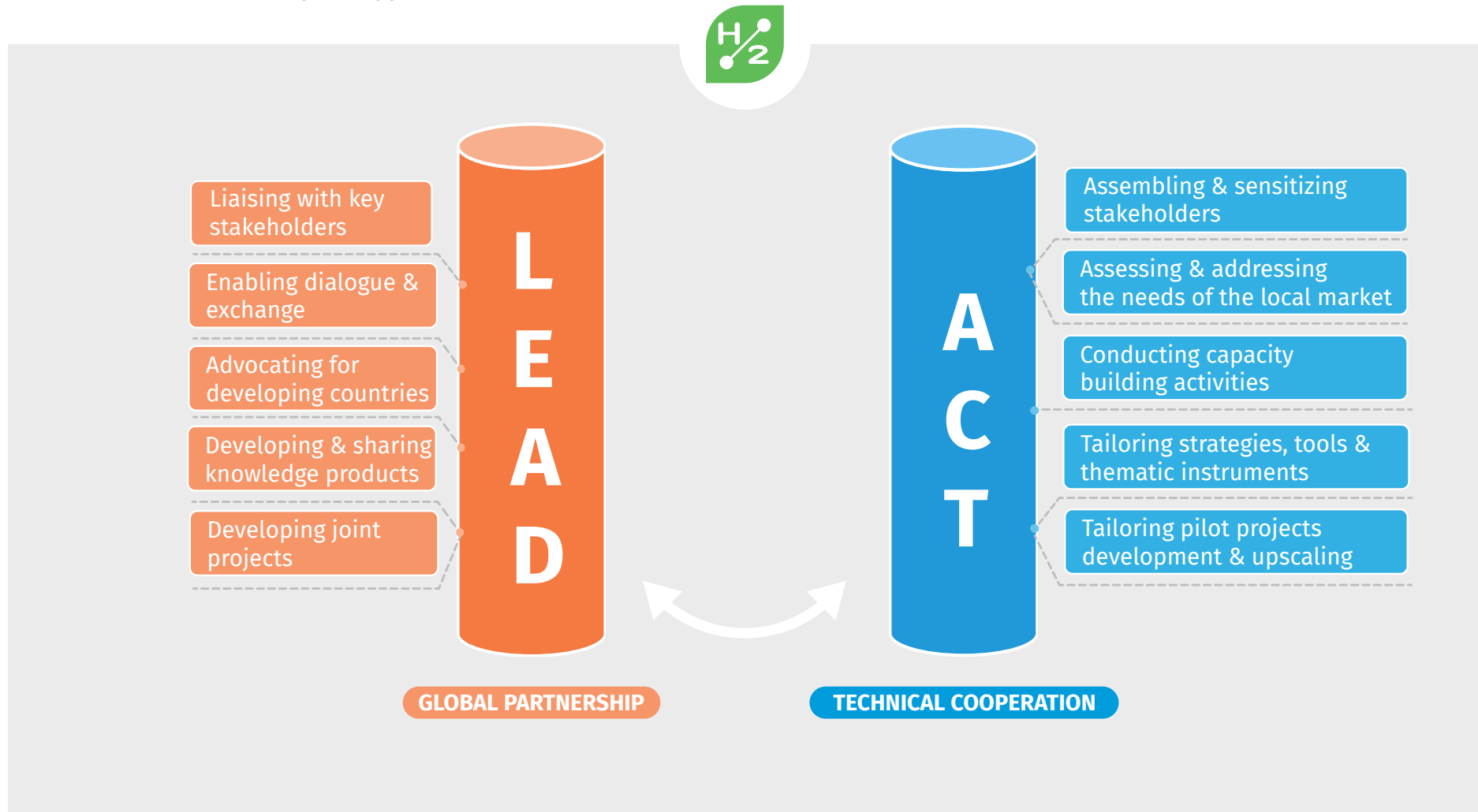
- ▶ National consultation on inclusive GH2 industrial cluster development.

HOW DO WE INTERVENE?

Given the complexity and dynamism of a just hydrogen transition, UNIDO has built its Global Programme around two pillars “LEAD” and “ACT” which draw on and feed into each other’s resources, expertise and networks.

The Programme consists of: The Global Partnership for Hydrogen in Industry and the Technical Cooperation with country-specific tailored interventions. Figure 1 depicts UNIDO’s approach to key areas of intervention of the Global Programme for Hydrogen in Industry.

FIG. 1: "LEAD & ACT" - a two-pillar approach



The Global Partnership for Hydrogen in Industry

It is a global platform for Member States, industries, private sector, investors, research and academic institutions. Through the Partnership, UNIDO regularly liaises with key stakeholders by conducting regional and global dialogue sessions with Member States to explore developing countries' needs and to enable dialogue and information exchange among them. These dialogues provide substantial material for UNIDO to articulate developing countries' interests and needs and advocate for them in global fora (e.g. COP, G7, G20). Moreover, based on dialogues' outcomes, UNIDO joins forces with renowned knowledge partners to address countries' needs and to develop training as well as innovative tools and solutions. These include designing and promoting policies, regulations, standards, financial instruments, and innovation programmes. The exchanges with stakeholders also give rise to ideas for joint projects development and active engagement of women and youth in the hydrogen market.

Technical Cooperation

UNIDO's Technical Cooperation adapts and applies knowledge and tools developed globally to country-specific interventions for green hydrogen in industry. This is done in close collaboration with the governments and industries of developing countries and transition economies. Such technical assistance entails sensitizing stakeholders, sharing best practices, as well as assessing local market needs and devising strategies, tools and instruments. UNIDO reviews countries' institutional and technical capacities and conducts capacity development where gaps have been identified. One key component of Technical Cooperation is its green hydrogen industrial cluster model, which is based on a co-location approach to local green hydrogen production, storage, transport and end-use.

UNIDO supports the development of pilot projects and makes recommendations on their upscaling. Through this pillar, UNIDO seeks to foster and accelerate countries' innovation capacities while solving existing challenges in green hydrogen development (e.g. water usage).

UNIDO's Global Programme for Hydrogen in Industry benefits from the technical support and know-how of the International Hydrogen Energy Centre (IHEC) in Beijing, launched by UNIDO and the Government of China in 2021. The Centre supports the creation of hydrogen value chains and focuses on the R&D, application and demonstration of key hydrogen technologies.



WHO ARE OUR PARTNERS?



Member States/
Public institutions



Industries & private
sector associations



Financial
Institutions



International
organisations



Research & Academic
Institutions

EXAMPLES OF COOPERATIONS:

- ▶ IRENA – developing a policy toolkit for GH2
- ▶ ISO – devising an international standard for renewable hydrogen based on CO2 content
- ▶ H2 Breakthrough Agenda – global review of financial instruments available for renewable hydrogen and low carbon hydrogen
- ▶ Women in GH2 – co-organization of a series of webinars and events

UNIDO:

YOUR COOPERATION PARTNER

With its multi-decade track record, UNIDO has created a unique base of institutional knowledge on identifying and tackling a range of obstacles developing countries face in their path towards sustainable industrialization. The Organization has a distinct UN mandate to promote net zero industrial development and successfully collaborates with a wide range of partners globally.

Its extensive expertise and experience in providing technical support to developing countries positions UNIDO as a strategic player in the global promotion of hydrogen application in industry. As an independent agent, UNIDO facilitates and accelerates the development of a just hydrogen market/economy, delivering on Sustainable Development Goal 9 (“industry, innovation and infrastructure”). With its wealth of knowledge, networks and services, UNIDO is your trusted partner in your transition to a sustainable and inclusive hydrogen economy.



Beyond the widely acknowledged benefits of a green hydrogen transition, UNIDO views it as an opportunity for new industrial development pathways and skills upgrading.

*Gerd Müller
UNIDO Director General*

LEARNING MORE

CONTACT - WEBSITE - PUBLICATIONS



[GH2: Fuelling industrial development for a clean and sustainable future](#)



[GH2: The energy opportunity for decarbonization and developing countries](#)



[Achieving a GH2 transition built on equity and consensus](#)



[Industrial and innovation policy can speed up the GH2 transition](#)

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