



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



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UNIDO's Global Programme for Hydrogen

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United Nations Industrial Development Organization



173 Member States, HQ in Vienna

UNIDO - a **UN agency** with a unique mandate to promote, dynamize and accelerate industrial development.

Since 1966, UNIDO provides:

- Technical cooperation;
- Action-oriented research & policy advisory services;
- Normative standards- and quality-related activities;
- Partnerships for knowledge and technology transfer.

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



Focus areas:

- **Ending hunger** by helping businesses from farm to fork;
- **Stopping climate breakdown** by using renewable energy and energy efficiency;
- **Supporting sustainable supply chains**



The Global Programme for Hydrogen in Industry

The Global Programme for Hydrogen (GPHI) in Industry serves as the **overarching umbrella** for UNIDO's hydrogen initiatives. Through its Technical Cooperation, the Global Programme promotes **net-zero industrialisation** through production and application of hydrogen in lead markets.

GPHI donors



Technical Cooperation Programmes and Projects at country level

- Global Clean Hydrogen Programme (GEF)
- International Hydrogen Energy Centre (IHEC)
- Green Hydrogen Energy Integrated Demonstration Application Project in China (GEF)
- Morocco & South Africa (Green Climate Fund) Readiness Programme
- Brazil-UK Hydrogen Hub (H2 Hub) & Hydrogen Project Implementation Assistance Facility





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GLOBAL PROGRAMME
HYDROGEN IN INDUSTRY

Global Programme for Hydrogen in Industry

Aims to contribute to accelerate local production and up-take of clean hydrogen in developing and transition economies and to support inclusive global clean hydrogen trade.

We support and guide the development of:



Policies & Regulations

Policy Toolkit: “GH2 for Sustainable Industrial Development”

Aligning industry and H2 policies



Coordination & Negotiations

Supporting COP Presidencies
E.g. H2 Declaration in Baku endorsed by 62 states & 47 organisations



Skills & Capacity Building

Skills Methodology



Standards & Certification

ISO/TS 19870 Guide



Sustainability

Guidelines



Innovation

International Hydrogen Energy Centre
Start-ups support (A2D Facility)



Financing

Blended finance
Carbon finance



Global Bridging

Matching supply and demand & national project implementation assistance



Inclusive Trade

International Hydrogen Trade Forum



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Status of H₂ projects

Commitment

510

Project globally (FDI +)

+83 projects
since May 2024

6 mtpa H₂e
Production capacity (FDI +)



● Pre-committed projects ● Committed (FDI+) projects with investment less than \$1 billion
● Committed (FDI+) projects with investment greater than \$1 billion

510
Committed (FDI+)
projects globally
+83 since May 2024

Committed
projects, #

94

North America
Includes 5 largest
low-carbon FDI+
projects

198

Europe
95% of FDI+
projects are
15 ktpa or smaller

94

China
Includes 6 out of 10
of the largest FDI+
renewable projects

38

Japan/Korea
Half of FDI+ projects
are transport and
infrastructure

86

Rest of World
Largest 3 projects are
in Middle East and
South America

Upscaling Hydrogen Demand Through Fertilizer Production

Ammonia-based fertilizers feed half the world's population

Critical Challenge

- ❑ **High emissions** : Fertilizer production emits ~730 Mt CO₂/year (2,5% of global emissions)
- ❑ **Concentrated supply chain**: Vulnerability to geopolitical shocks, volatile feedstock prices, and supply risks
- ❑ **Food insecurity**: High fertilizer costs, supply volatility, and limited access

The challenge is cost. Producing fertilizers from renewable hydrogen today is 2x to 4x more expensive than fossil-based methods - the so-called "green premium."

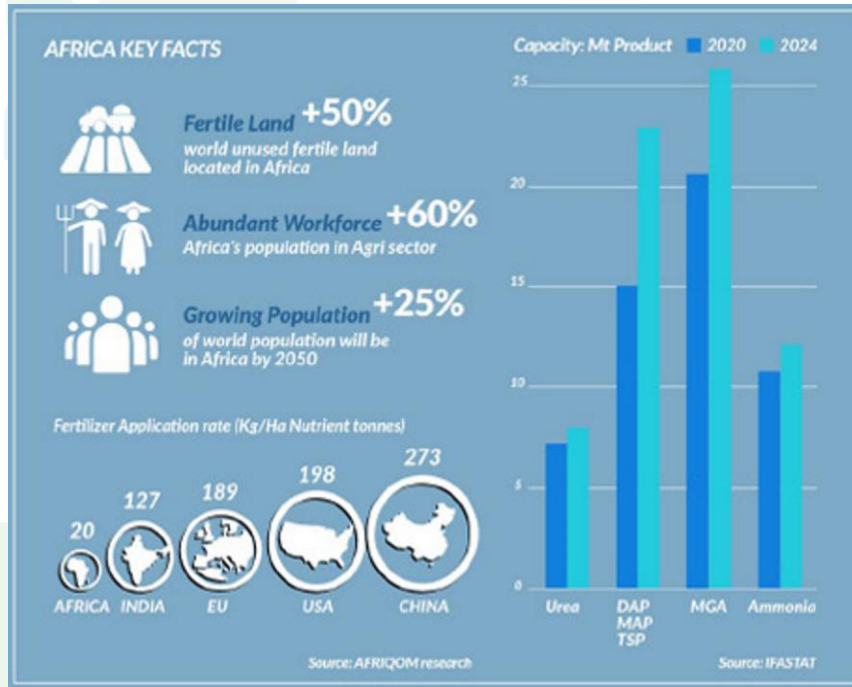
Green Opportunity

- ❑ **Ammonia from clean hydrogen**:
Decoupling food systems from fossil fuels
- ❑ **Industrial development potential**:
Localizing fertilizer production can reduce import dependency and create economic opportunities
- ❑ **Enhanced resilience**: Cleaner inputs and decentralized production cut emissions and increase food security





Fertilizers in Africa: A Case for Localizing Production



- **Cost of transport** to landlocked countries increases fertilizer cost by up to **4x**
- Africa's average fertilizer use at **20kg/ha**, far below the global average of **135 kg/ha**
- **90% import dependency:** Africa's reliance on imported fertilizers creates vulnerability to global market shocks
- **\$2 billion annual subsidies** spent on high-emission grey ammonia-based fertilizers



Concept: Low-Emission Ammonia Fertilizer Initiative (LEAFI)

Low-emission ammonia fertilizers connect the dots between climate, food security, trade, and industrial development

Demand signals

Establish reliable public and local demand

- Anchor local demand through government policy, green public procurement and sustainable subsidy re-direction
- Foster **collaboration along the value chain**: From fertilizer producers to farmers to food companies to consumers

Lead market creation

Support market development by distributing the green premium along the value chain

- Contribute to hydrogen **lead markets** in Europe and beyond
- **Aggregate demand** of international food sector
- **Buyer's alliances** in cooperation with Hydrogen Europe and Hydrogen Council

Feasibility of localization

Identify promising regions

- Exploratory market and technical feasibility studies

Prepare the ground

- Facilitate local fertilizer production via sensitization workshops, government outreach, private sector networking & matchmaking



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UNIDO Global Programme for Hydrogen in Industry

<https://www.unido.org/solutions/global-programme-hydrogen-industry>

The Brussels Time - From gas to green: Why Europe cannot ignore fertilizer's hidden carbon footprint

<https://www.brusselstimes.com/opinion/1768451/from-gas-to-green-why-europe-cannot-ignore-fertilizers-hidden-carbon-footprint>

THANK YOU

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