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Enabling trade in green hydrogen and derivative commodities: a cross-Mediterranean perspective

Wednesday 15th October 2025 • 13:00 – 13:45 CEST

Presenters:
Frank Wouters, Director, MED-GEM
James Walker, Team Lead – Renewable Gases, IRENA
Svetlana Chobanova, Legal Officer, WTO
Mustapha Taoumi, Expert, MED-GEM

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SPEAKERS

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Agenda

- Opening remarks,
  Frank Wouters, MED-GEM
- ‘Enabling international trade in renewable hydrogen and derivatives’,
  James Walker, IRENA & Svetlana Chobanova, WTO
- ‘Enabling cross-Mediterranean trade in green hydrogen and derivatives’,
  Mustapha Taoumi, MED-GEM

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Opening remarks

Frank Wouters
Director, MED-GEM

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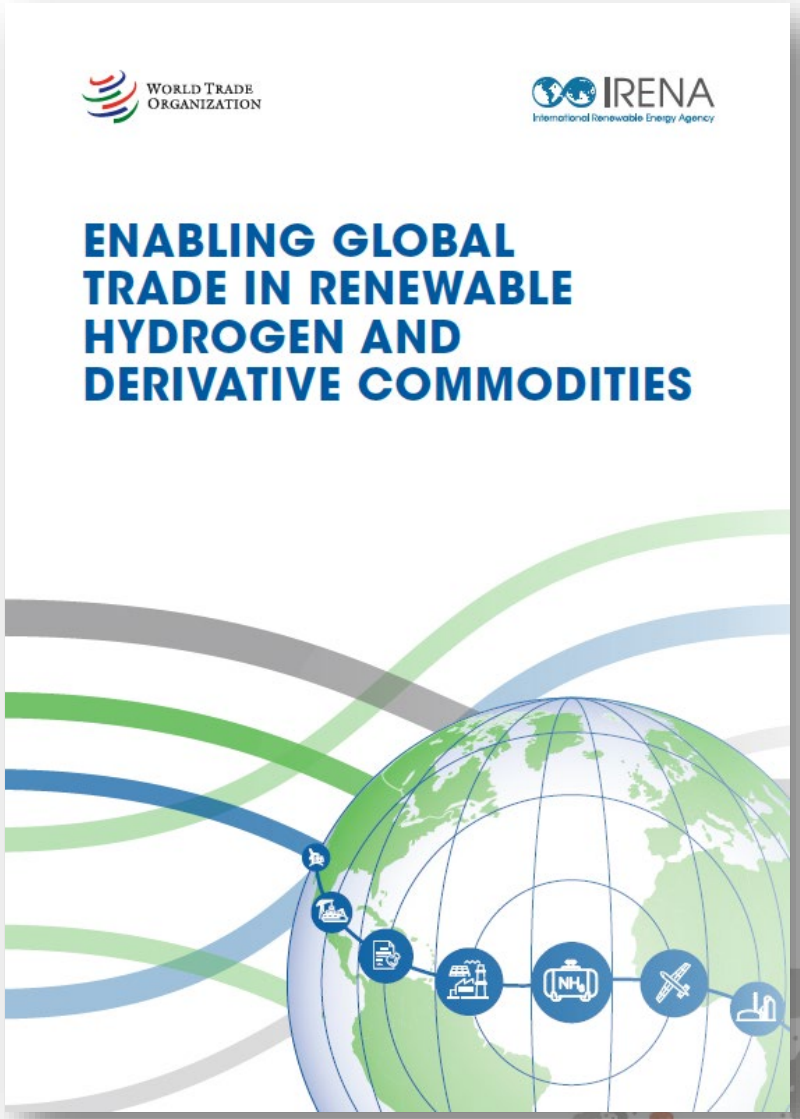

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Enabling international trade in renewable hydrogen and derivatives

James Walker, IRENA
Svetlana Chobanova, WTO

Renewable power becomes the most important energy carrier in climate target-aligned pathways towards 2050

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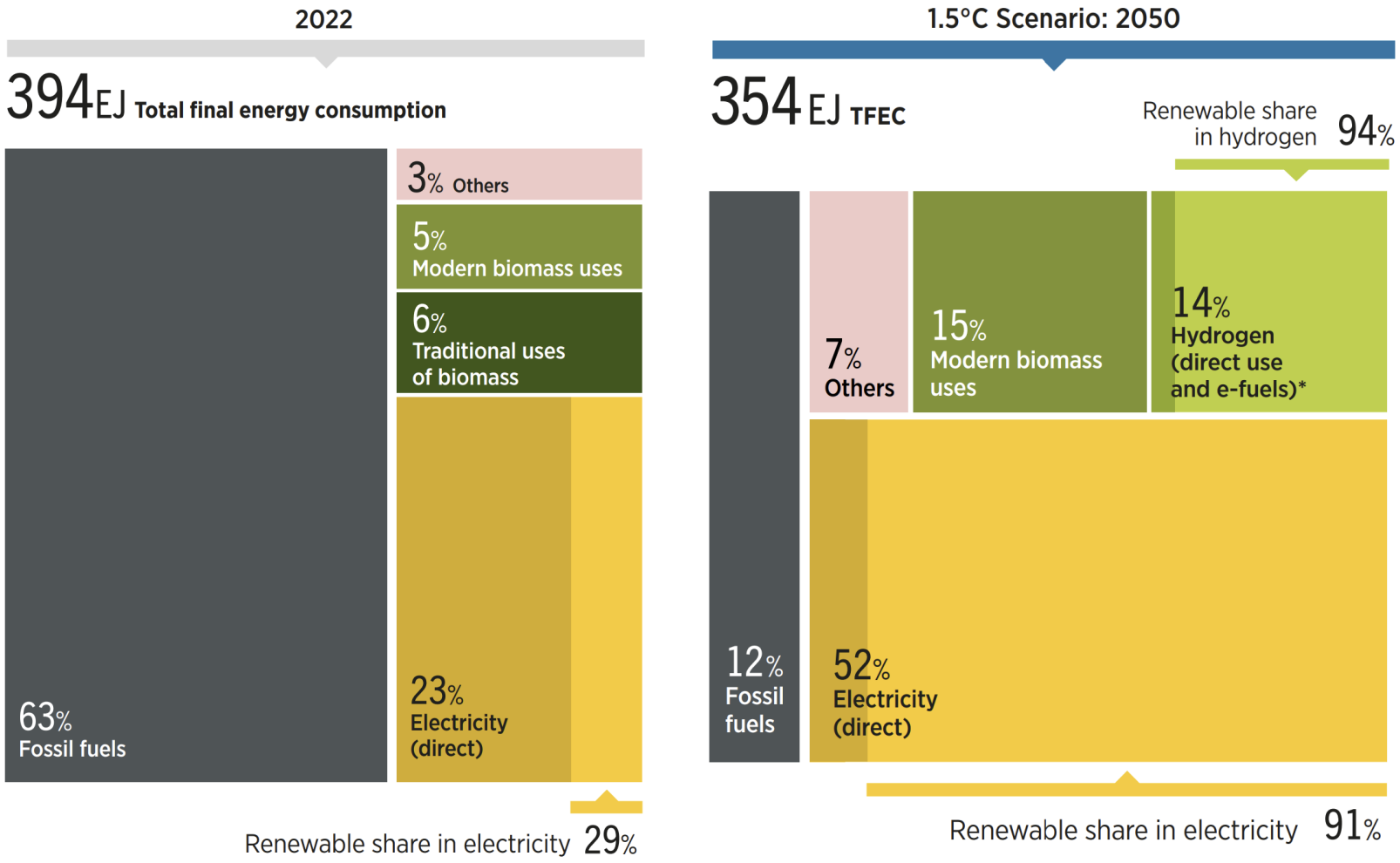
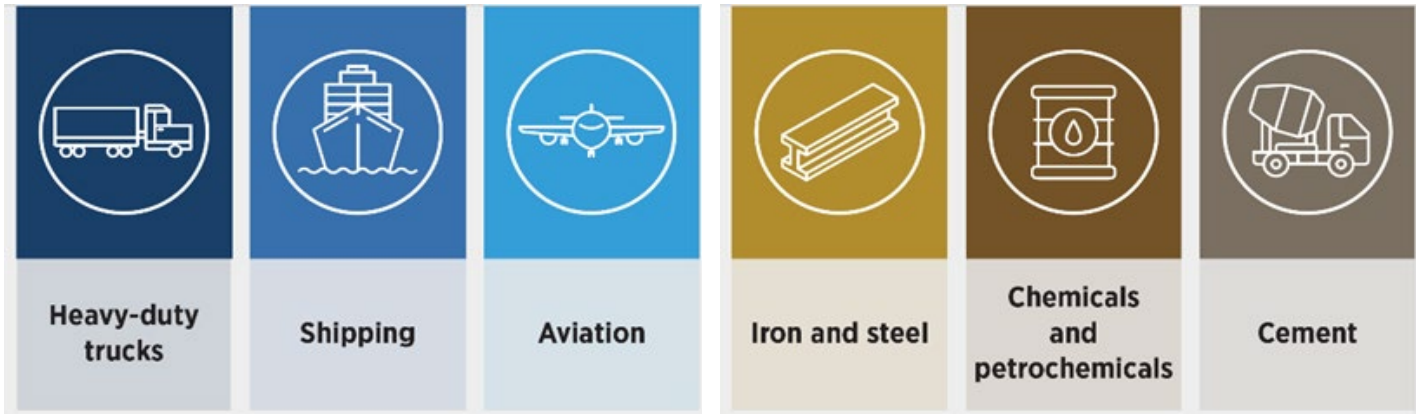
Breakdown of total final energy consumption by energy carrier in 2022 and 2050 under IRENA's 1.5°C Scenario:



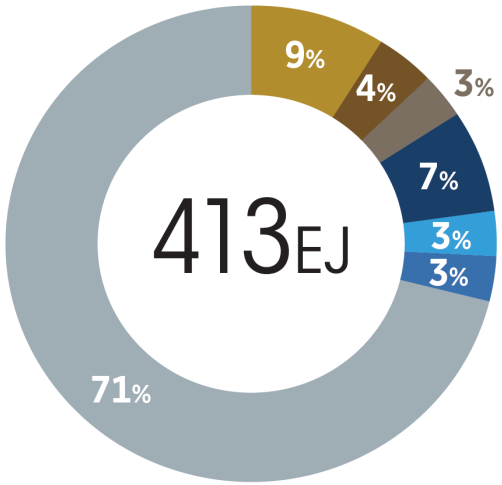
- Compared to 2022, this means **3X** more renewable power by **2030**, and **9X** more by **2050**

Source: IRENA, 2024: World Energy Transition Outlook.

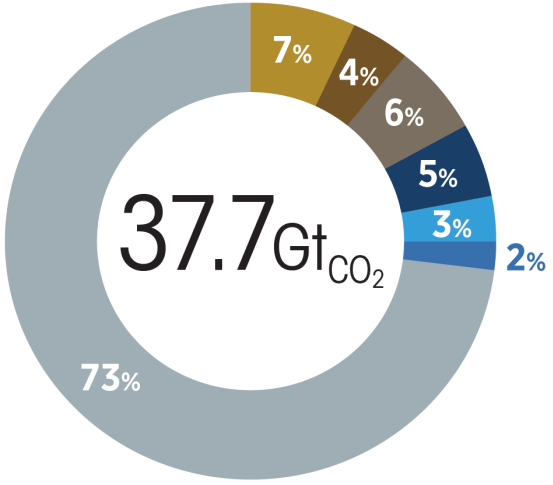
Hard to abate sectors account for a significant proportion of global emissions. Renewables are essential for their decarbonisation



2023



Final Energy Consumption



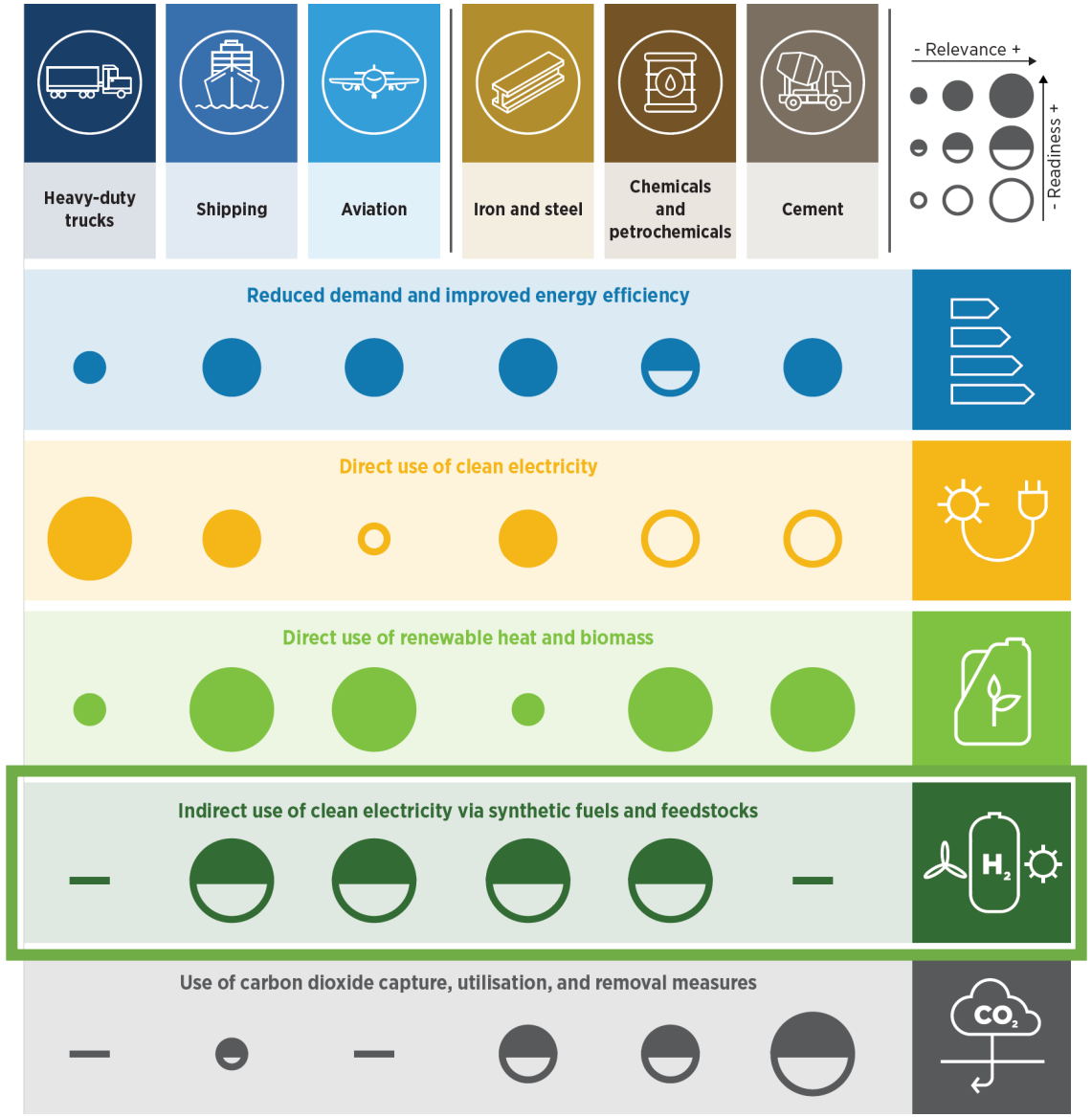
CO_2 Emissions

Source: IRENA, 2025: Enablers to decarbonise hard-to-abate sectors.

Various solutions are needed. Hydrogen and derived commodities have an important role to play in key sectors

Efficiency is key in all sectors.

Other vectors and fuels will be needed in several sectors and applications.

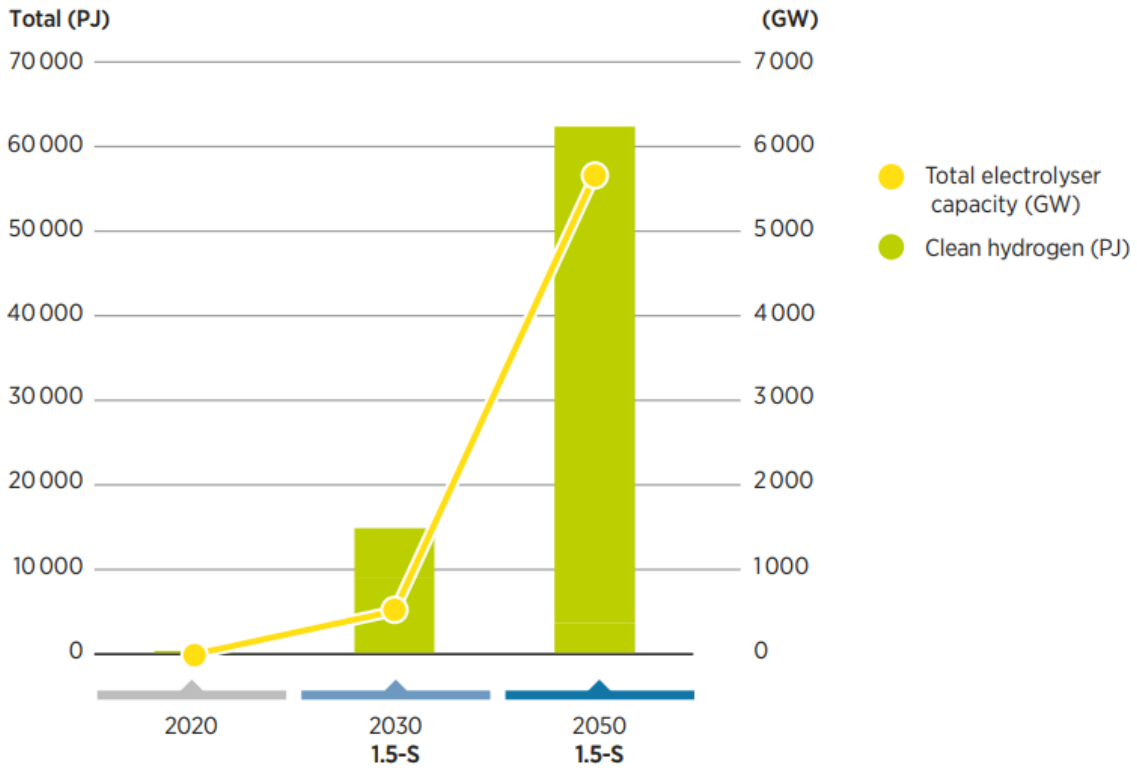


Many processes can be electrified directly.

Source: IRENA, 2025: Enablers to decarbonise hard-to-abate sectors.

Scaling hydrogen production will be a major challenge

Global clean hydrogen supply in 2020, 2030 and 2050 in IRENA's 1.5°C Scenario.



Notes: 1.5-S = 1.5°C Scenario; GW = gigawatt; PJ = petajoule.

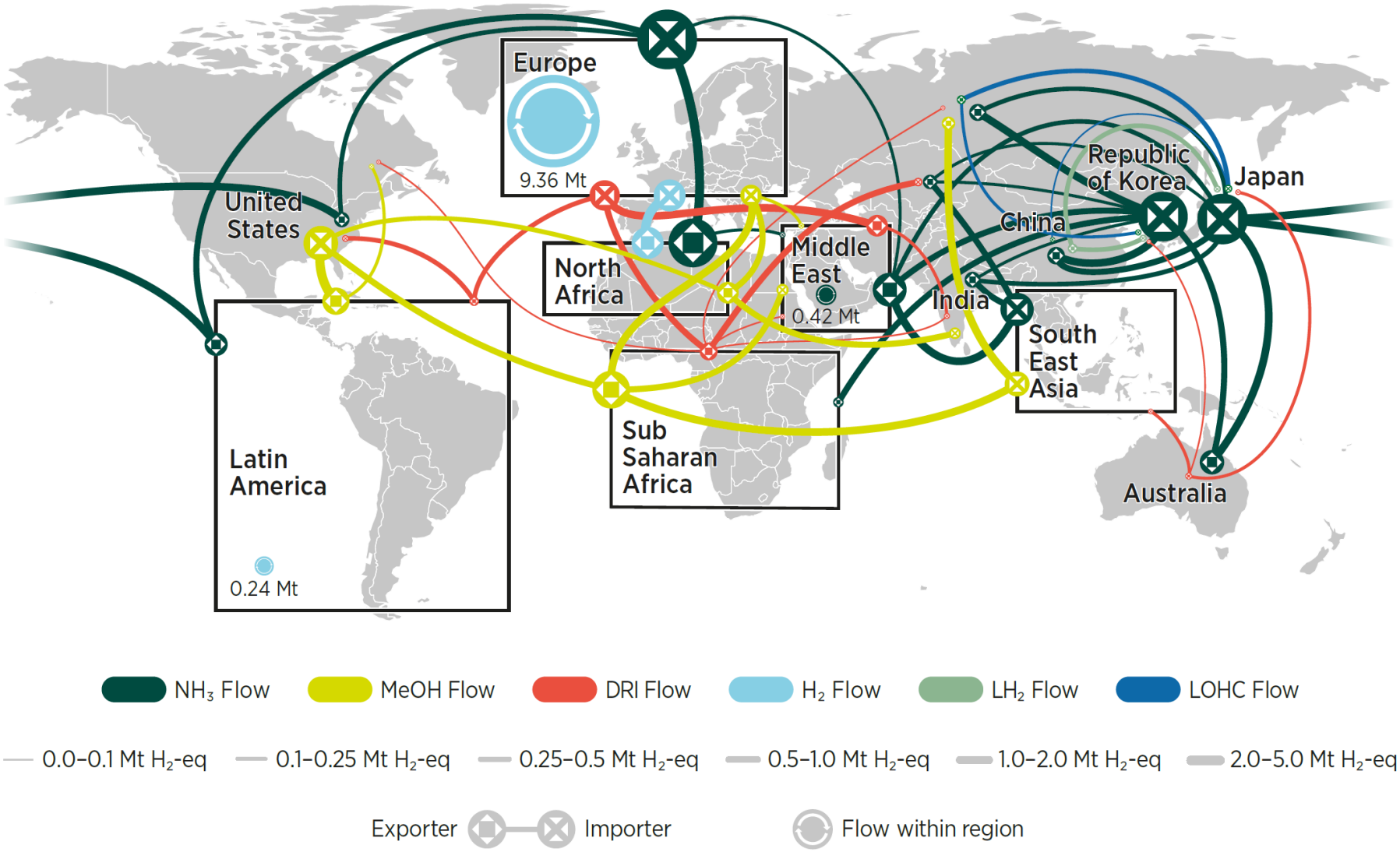
- Most of **today's hydrogen production is fossil-derived** (mostly natural gas, but also coal)
- Most global hydrogen **production in 2050 should come from renewables**
- The electricity requirement for **green hydrogen in 2050 is comparable to today's global electricity consumption.**
- From **~ 1 GW to >5700 GW** electrolyser capacity by 2050.
- **International markets may play an important role in cost effective supply.**

Source: IRENA, 2023. World Energy Transitions Outlook 2023: 1.5°C Pathway, Volume 1

About 20% of the global hydrogen and related commodities demand could be internationally traded in 2050

In this scenario,

- **Ammonia:** ~30% of global demand is traded
- **E-Methanol:** ~18% of global demand is traded
- **Direct Reduced Iron (DRI):** ~14% of demand is traded (in hydrogen equivalent)
- **Gaseous Hydrogen:** ~14.4% of total demand is traded



Notes: NH_3 = ammonia; H_2 = compressed gaseous hydrogen; MeOH = methanol; DRI = direct reduced iron; LOHC = liquid organic hydrogen carriers; LH_2 = liquid hydrogen.
The thickness of the lines represents the volume of green commodity flows in Mt H_2-eq. Circles with a square inside represent the origin of green commodity supply, while circles with a cross inside represent the commodity demand. Most countries are represented in regions for the presentation of trade flows.

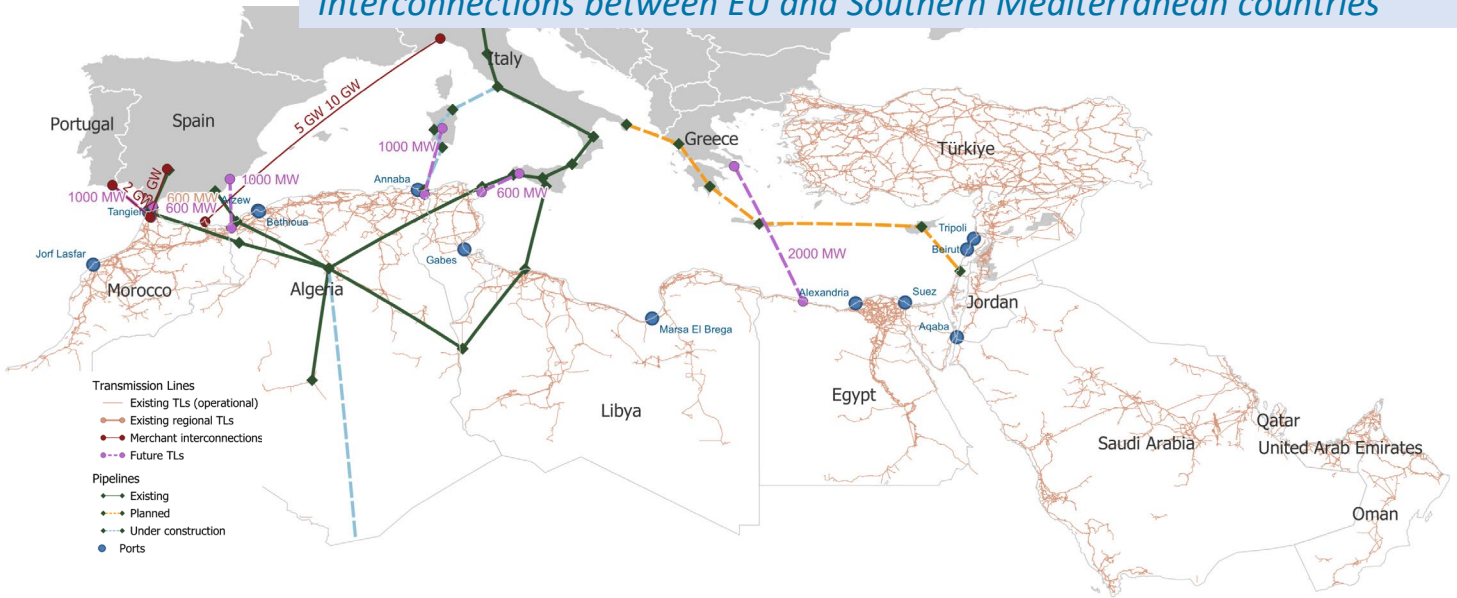
Source: IRENA, 2025: The potential for green hydrogen and related commodities trade.

Interconnections can power a shared green future

The Mediterranean region's energy transition requires massive grid investment for flexibility and renewable integration.

Trans-med interconnections (currently ~7.3 GW planned) can enhance security of supply and drive down costs long term.

Interconnections between EU and Southern Mediterranean countries

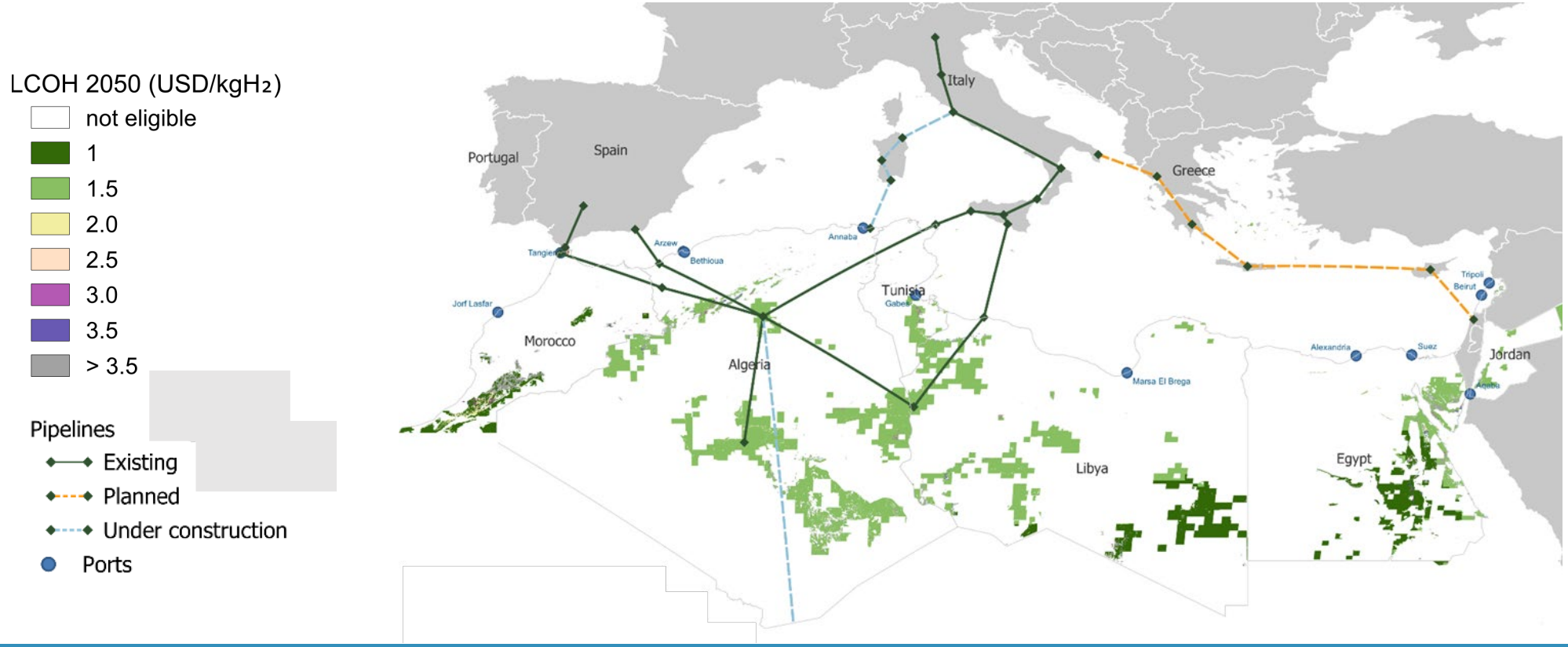


Renewable Energy Capacity	Investment in Local Manufacturing	Reduced Import Dependency	Economic Growth Impact

Source: (IRENA, 2024. T-MED Energy: A Transformative Plan for a Euro-Mediterranean Energy Partnership)

North Africa has high potential for low-cost hydrogen production

Levelised cost of hydrogen (LCOH) production map in 2050 (USD/MWh)

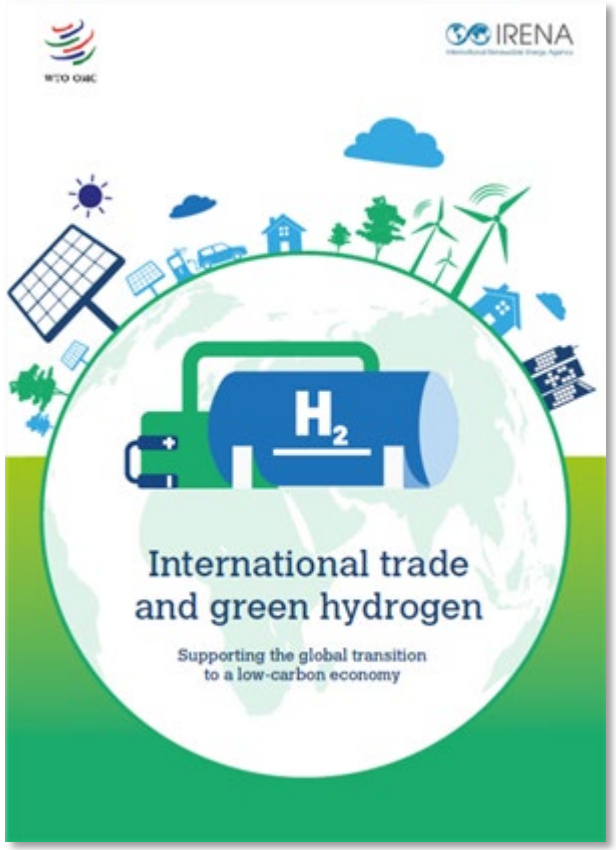


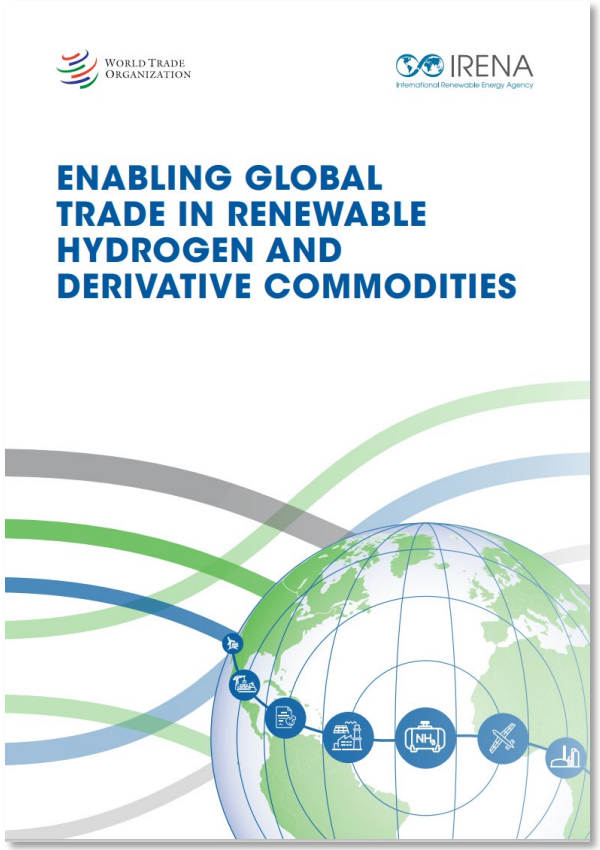
Projected LCOH allows to supply domestic and international hydrogen markets

With a projected, **highly competitive LCOH of USD 1-1.5/kgH2 by 2050, North African countries are** well-positioned to become a dominant player, exceeding **domestic demand and supplying international markets**.

Source: (IRENA, 2024. T-MED Energy: A Transformative Plan for a Euro-Mediterranean Energy Partnership)

IRENA and WTO teamed up to provide in depth insights on green hydrogen and commodity trade.

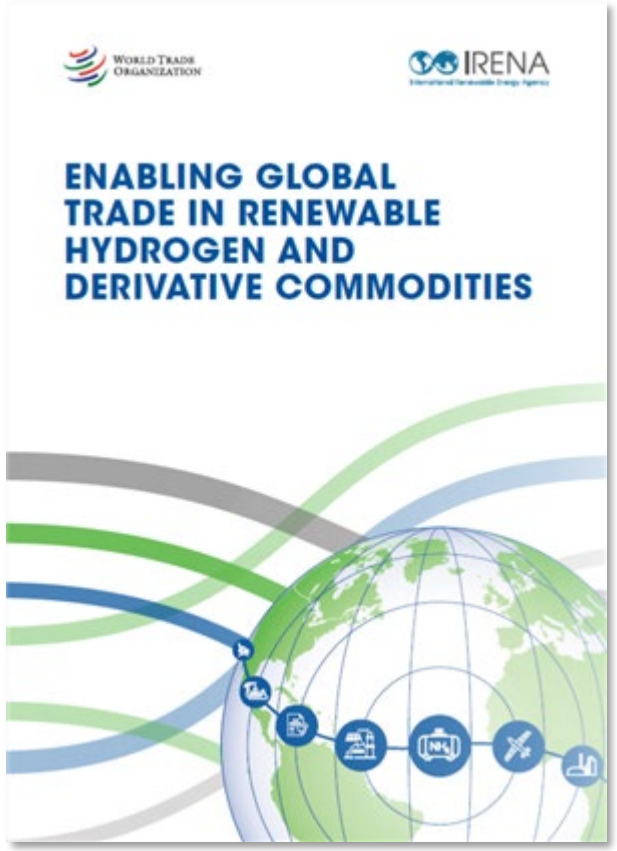




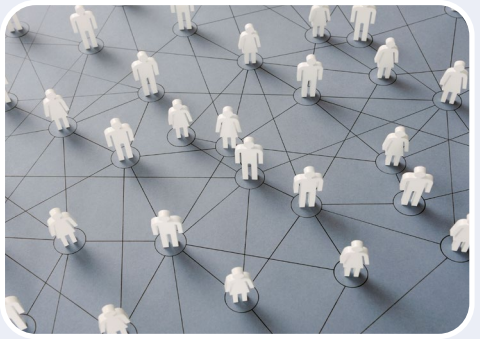
- Many member countries seek to establish trade and international markets for hydrogen and its derivatives.
- The 2023 report reviewed the **current state of these markets** and offered recommendations for policymakers to use trade in advancing hydrogen deployment during the energy transition.
- The 2024 report focused on the **key physical, institutional, and social enablers** needed for hydrogen-derived commodity trade.

Source: WTO and IRENA (2023) International trade and green hydrogen: Supporting the global transition to a low-carbon economy
IRENA and WTO (2024), Enabling global trade in renewable hydrogen and derivative commodities, International Renewable Energy Agency and World Trade Organization, Abu Dhabi and Geneva.

Our 2024 report focuses on enabling measures for scaling international markets in the green derivative sectors (ammonia, methanol, and e-kerosene).



Eleven enabling measures are considered across three pillars. Highlighted enablers include:



1) Infrastructure:

Holistically consider resource availabilities and requirements when planning infrastructure development, and ensure adequate supply of renewable electricity, water and carbon.

2) Institutional:

Align standards and reduce divergences in certification to ensure credible global markets and foster consumer confidence across international borders.

3) Social:

Embed job creation in national action planning for hydrogen and the derivative sectors, and understand the opportunities available to use industrial development to achieve socioeconomic progress.

Source: IRENA and WTO (2024), Enabling global trade in renewable hydrogen and derivative commodities

The eleven enablers identified in the report cover all kinds of considerations for scaling up international green hydrogen derivative trade.

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1. **Holistically consider resource availabilities and requirements when planning infrastructure development** and ensure adequate supply of renewable electricity, water and carbon.

2. **Prioritise distribution infrastructure as a means to ensure market access for producers** and consider how consumers will access the traded commodities.

3. **Support the development of diversified supply chains across these sectors** to enhance resilience.

4. **Align standards and reduce divergences in certification** to ensure credible global markets and foster consumer confidence across international borders.

5. **Calibrate government support and procurement** to facilitate demand, de-risk off-take and drive supply chain development.

6. **Rebalance tariffs** for key products and services along the renewable hydrogen and derivatives value chains to reduce costs and encourage technology uptake.

7. **Coordinate carbon pricing mechanisms** to enhance competitiveness and level the playing field.

8. **Harness international cooperation**, and use the fora available to identify best practices, increase efficiency, and ensure equitable growth.

9. **Balance local and international market focus** to encourage sustainable industrial development and consider which markets will add the most value locally.

10. **Embed job creation in national action planning** for hydrogen and the derivative sectors and understand the opportunities available to use industrial development to achieve socioeconomic progress.

11. **Develop community and stakeholder engagement guidelines** to follow and encourage project developers to build genuine social acceptance for their projects.

Source: IRENA and WTO (2024), Enabling global trade in renewable hydrogen and derivative commodities

Institutional enablers

1. ALIGNING STANDARDS AND REDUCING DIVERGENCES IN CERTIFICATION TO ENSURE CREDIBLE GLOBAL MARKETS

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Role of international standards and certification	Provide a framework for measuring and verifying the environmental integrity of hydrogen production.
	Facilitate trade by creating a common understanding of what qualifies as renewable hydrogen, reduce information asymmetries and ensure transparency.
Challenges of diverging standards	A wide range of national and regional certification schemes exist (CertifHy, the Green Hydrogen Standard, the Zero Carbon Certification Scheme, etc.).
	Different approaches to hydrogen classification; different emissions thresholds; differing criteria and scope of methodologies.
	Differences in emissions thresholds and methodologies create unpredictability for producers, increase transaction costs and reduce the effectiveness of carbon emissions reduction efforts.
Need for continuous coordination	To align technical criteria for defining green and low-emission hydrogen.
	To ensure greater interoperability between certification schemes in order to provide clarity for investors and project developers.

CertifHy®

ISO

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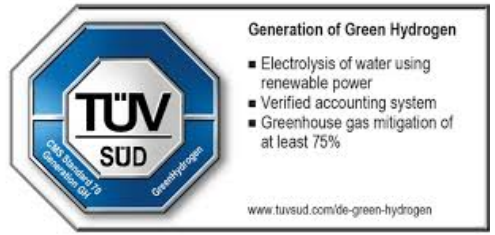
中部圏低炭素 H H 水素認証

ZERO CARBON HYDROGEN AUSTRALIA
A DIVISION OF SMART ENERGY COUNCIL

GH2 | Green Hydrogen Standard



1. ALIGNING STANDARDS AND REDUCING DIVERGENCES IN CERTIFICATION TO ENSURE CREDIBLE GLOBAL MARKETS

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Recent developments	ISO methodology for determining the GHG emissions associated with the production, conditioning and transport of hydrogen to consumption gate.
	COP28 Declaration of Intent on Mutual Recognition of Certification Schemes / COP29 Hydrogen Declaration (stimulate demand, global standards, R&D investment, financial support, just transition)
Capacity building for developing countries	Technical assistance to establish robust quality infrastructure and conformity assessment systems to verify compliance with international standards.
	Strengthening these capabilities can help ensure that producers in emerging markets can participate in global hydrogen trade.
Derivative commodities	Renewable hydrogen derivatives such as ammonia, methanol, and e-kerosene require tailored certification approaches based on their end uses.
	An opportunity for global multi-sectoral cooperation to ensure that emerging standards and certification schemes are interoperable and enable comparison and transparency across hydrogen derivatives.

2. CALIBRATING GOVERNMENT SUPPORT AND PROCUREMENT TO FACILITATE DEMAND AND OFFTAKE

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Government support and procurement

- Subsidies lower investment risks for producers by reducing the high initial costs of production, while green government procurement ensures stable demand for sustainable products.
- They drive market development and create long-term incentives for producers to invest in green technology, foster technological advancements, and scale production.
- Tax incentives: Reducing corporate income tax, offering VAT exemptions, and investment tax credits for renewable hydrogen technologies; taxation based on energy content and CO2 emissions rather than volume.
- Aligning strategies with international trade rules ensure transparency, non-discrimination and fair competition.

Policy objectives and tools

- Supporting long-term demand: demand-side targets and quotas, R&D funding, price premiums for renewable hydrogen.
- Encouraging upfront investments: fiscal policies reducing initial costs for purchase of land / leasing, investment deductions and capital allowances extending to electrolysers and renewable technologies.
- Bridging the price gap and fostering investor confidence: green procurement, government tenders, Contracts for Difference (CCfDs) and auction systems, advance market commitments.
- Lowering capital borrowing costs and derisking investment: government-backed guarantees, credit enhancement programmes, collaborating with development finance institutions, fostering public-private partnerships.

Derivative commodities

- Supporting green fuels and investments: producer or blender tax credits, loan guarantees and grants for renewable fuel production.
- Encouraging green shipping practices: lower port fees and taxes for ships with reduces GHG emissions, levies based on fossil fuel consumption, tax breaks for sustainable marine fuels.
- Shifting towards sustainable fertilisers: redirecting subsidies towards green ammonia.

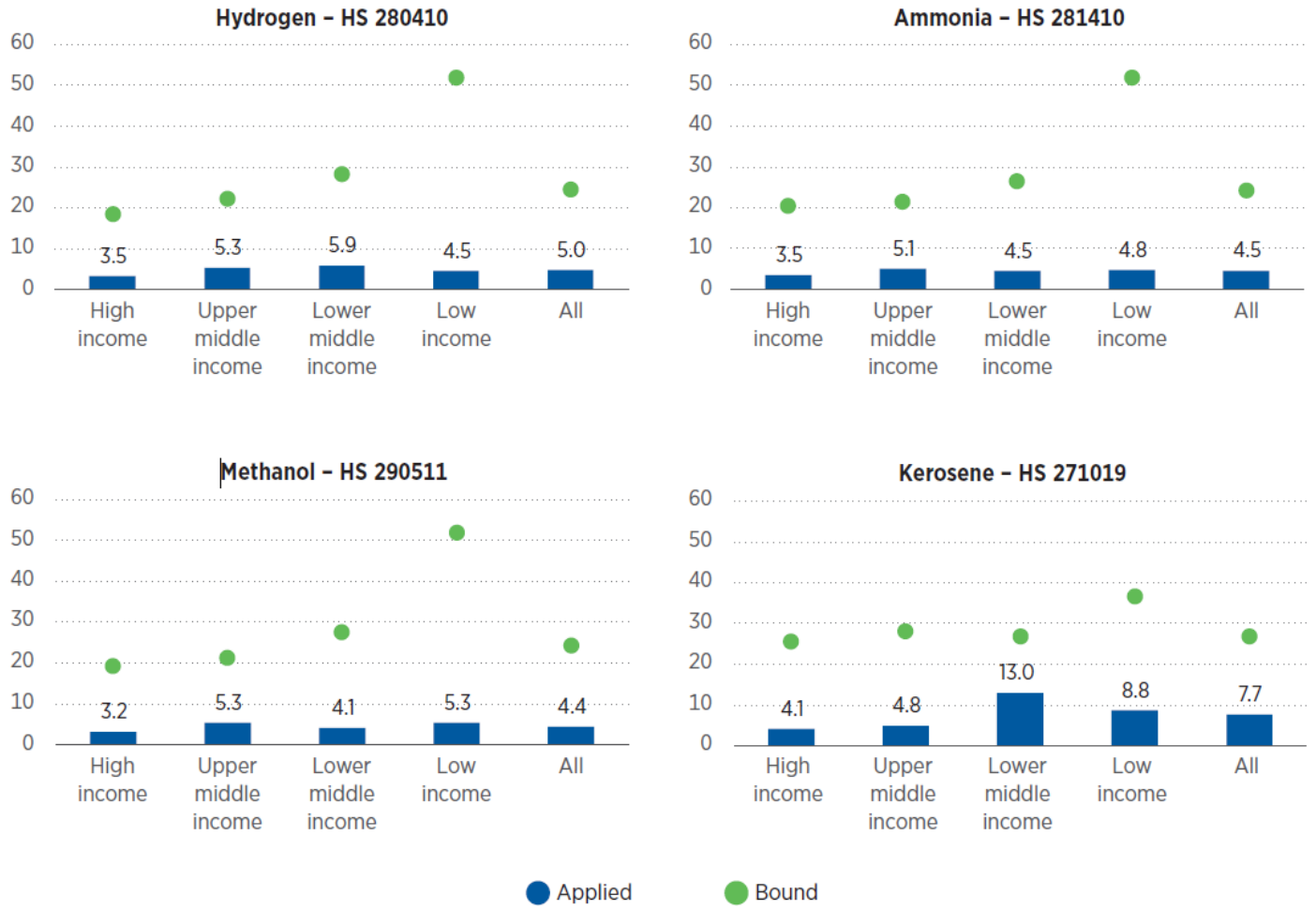
3. REBALANCING TARIFFS FOR KEY PRODUCTS AND SERVICES TO REDUCE TECHNOLOGY COSTS

Reviewing and rebalancing import tariffs along the renewable hydrogen value chains can drive the development of sustainable energy systems.

Currently, renewable hydrogen, ammonia, methanol, and e-kerosene are classified under the same customs codes as their fossil-based counterparts.

The WCO Harmonised System commodity categories are not based on process and production methods.

But there are efforts to green the HS to support environmentally sustainable trade.



3. REBALANCING TARIFFS FOR KEY PRODUCTS AND SERVICES TO REDUCE TECHNOLOGY COSTS

Policy Options

- Creating separate tariff classifications for renewable hydrogen and derivatives at the national or WCO HS level → increase transparency, facilitate monitoring of international trade and help implement more effective policies.
- Reducing or eliminating tariffs on renewable hydrogen-related technologies, such as electrolysers, compressors and fuel cells → reduce renewable energy costs and increase the uptake of low-carbon technologies.
- Coordinating tariff reductions among interested members, following past examples like the Information Technology Agreement (ITA).

Leveraging Trade Facilitation

- WTO Trade Facilitation Agreement can enhance sustainable trade, reducing costs and delays for cross-border shipments.
- Simplifying customs procedures, increasing transparency and harmonising documentation requirements.
- Align trade facilitation with climate action and adopt green customs procedures, such as electronic documentation, harmonising inspections and expedited conformity assessment procedures, and facilitating implementation of low-carbon freight transport.

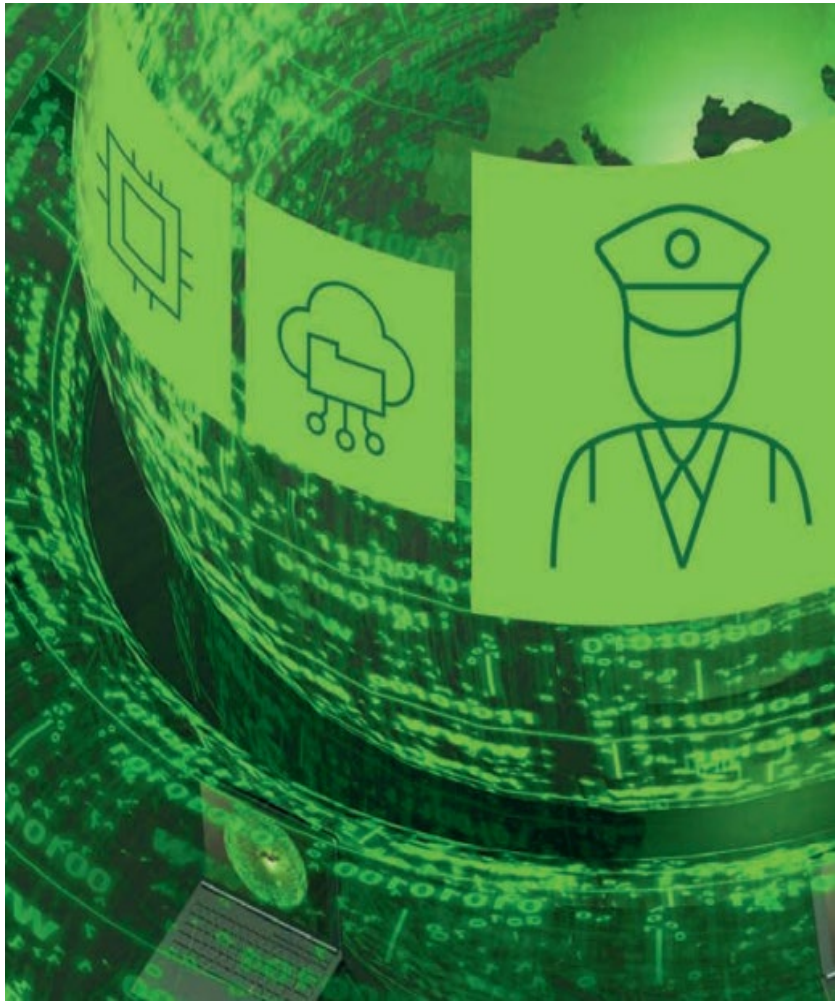


Photo credit: WCO

4. CO-ORDINATING CARBON PRICING MECHANISMS TO ENHANCE COMPETITIVENESS

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Carbon taxes and emissions trading systems provide incentives for industries to transition to low-carbon alternatives and specialise according to green comparative advantage.

Over 70 different carbon pricing schemes exist globally, covering around 23% of total emissions.

Several instruments cover hydrogen and derivatives.

Cooperation to align carbon pricing approaches could help ensure a level playing field, promote efficiency, and drive investment in cleaner energy solutions.

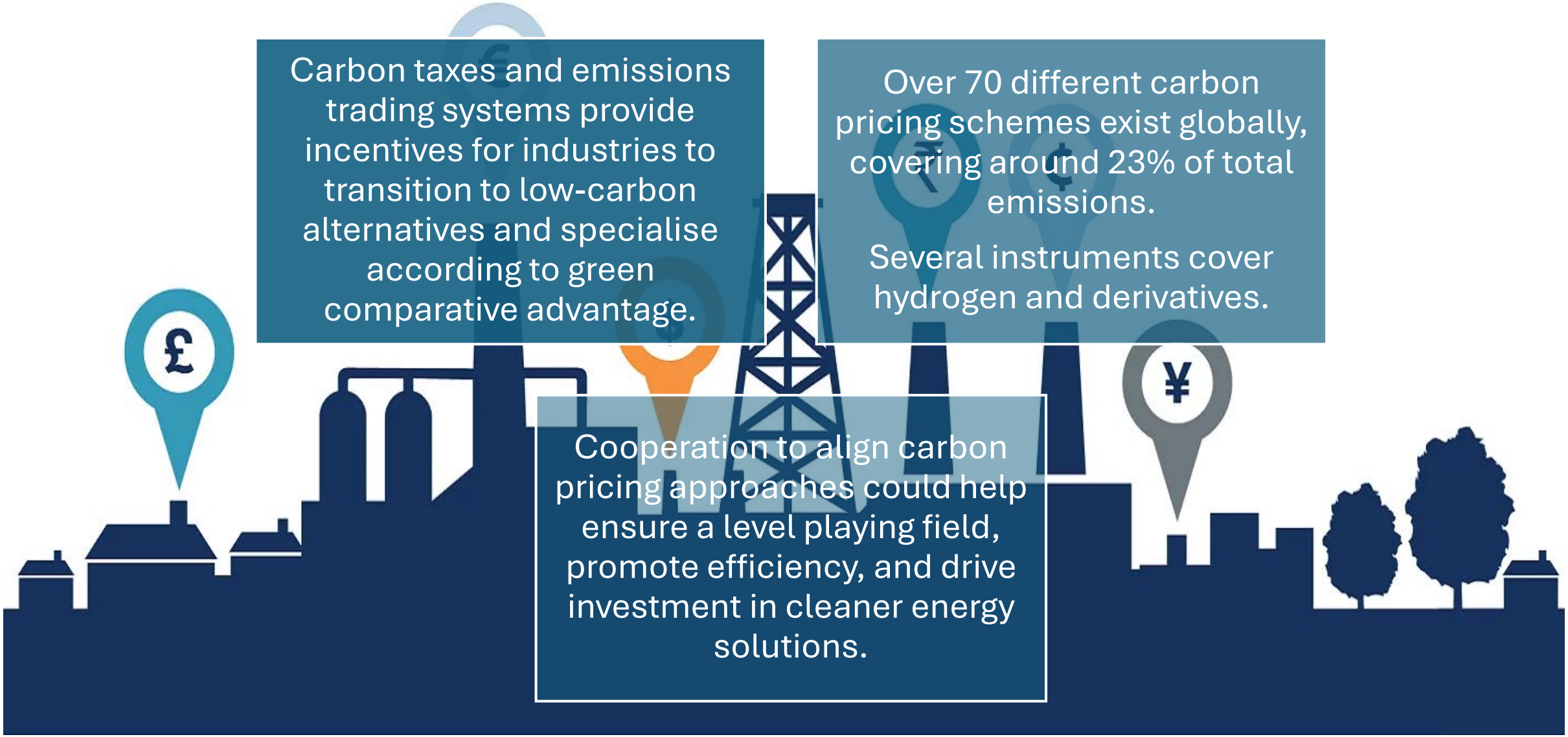

Photo credit: World Bank

5. HARNESSING INTERNATIONAL COOPERATION TO ENSURE EQUITABLE GROWTH

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The Need for Global Coordination

- Divergent national policies on subsidies, carbon pricing, and certification standards create inefficiencies and raise trade costs.
- Uncoordinated measures may trigger retaliatory trade actions, reducing the effectiveness of climate policies.

Key International Initiatives

- The International Hydrogen Trade Forum (IHTF), launched in 2023, facilitates dialogue between hydrogen exporters and importers.
- IRENA's Collaborative Framework on Renewable Hydrogen provides a platform for knowledge sharing and capacity building.
- Global alliances and regional agreements can promote technology transfer, investment, and harmonized regulatory frameworks.

Opportunities for Developing Economies

- Many developing countries have strong renewable energy potential, offering them a competitive advantage in producing renewable hydrogen.
- Support for technology diffusion and infrastructure development can help these economies benefit from the global hydrogen transition.

Case Study: Applications of institutional enablers in Chile

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Emission Trading System – A cap-and-trade mechanism to incentivize hydrogen adoption in high-emission industries.

Tax Incentives – Reduced corporate income tax and enhanced R&D tax credits for hydrogen-related technologies.

Electrolyser Subsidies – Up to USD 10 million in subsidies for companies investing in electrolyser production.

State-Owned Land Allocation – Dedicated areas for large-scale hydrogen production facilities through the "Ventana al Futuro" program.

International Certification Alignment – Development of a national sustainability certification system to align with global standards.

Investment Incentives – Financial instruments to de-risk hydrogen projects and attract private capital.

Support for SMEs – Co-financing schemes to help small and medium-sized enterprises enter the hydrogen market.

Hydrogen-Powered Public Transport – Introduction of hydrogen-powered buses by 2025 to assess feasibility.

Green Maritime Corridors – Development of low-emission shipping routes, with the goal of launching Latin America's first commercial green corridor by 2030.

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Webinar | 15 October 13:00-13:45 CET (15:00-15:45 GST)

Enabling Trade in Green Hydrogen and Derivative Commodities: a Cross-Mediterranean Perspective.

Dr Mustapha Taoumi,
MED-GEM | Expert

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Introduction & Context

- **Topic:** Enabling cross-Mediterranean trade in green hydrogen and derivatives.
- **Relevance:** Green hydrogen could supply **up to 14% of global final energy by 2050** (IRENA).
- **Opportunity:** Southern Mediterranean Countries (SMCs) – abundant renewables, strategic location near Europe.
- **Objective:** Highlight enabling conditions for green hydrogen trade between SMCs and Europe.

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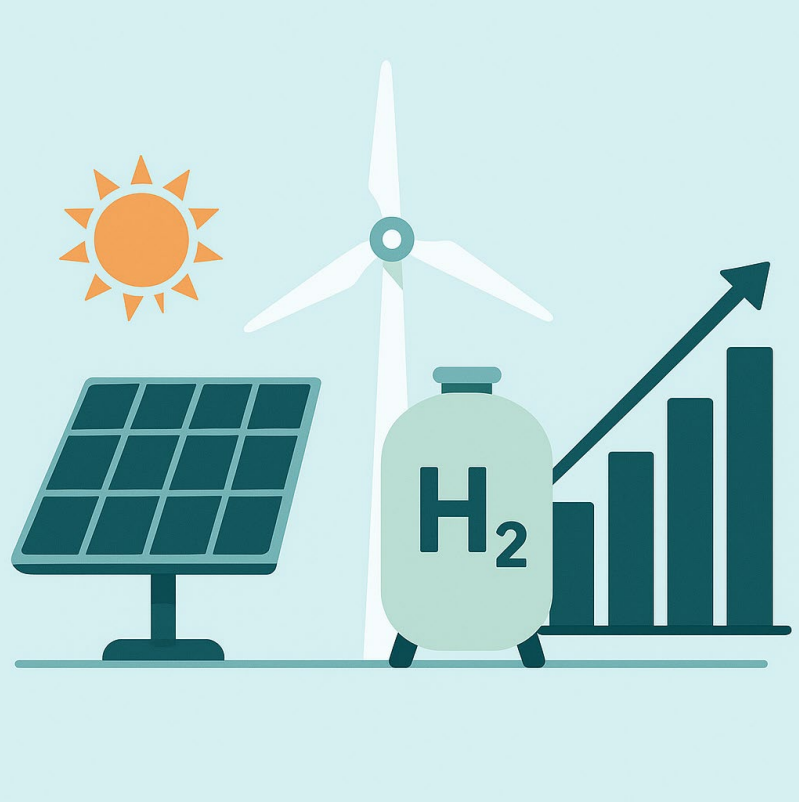
The Global Hydrogen Outlook



- **Global Demand:** 260 million tonnes H_2 by 2050.
- **Investment Needs: USD 2.5 trillion** for production, transport, and storage.
- **Renewable Requirements:** 4.7 TW renewable power, 2.1 TW electrolyzers.
- **Key Drivers:** Decarbonization of industry, transport, and ANEAN GREEN ELECTRONS AND MOLECULES

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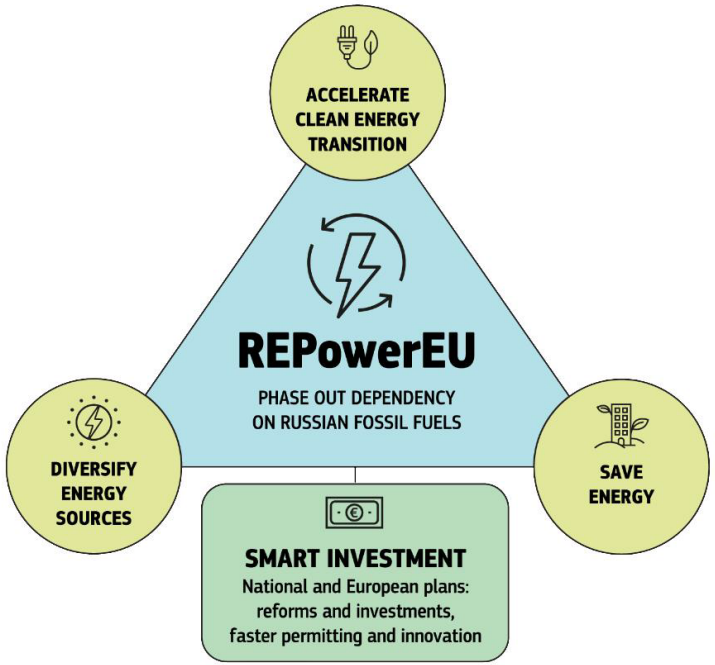
Europe's Hydrogen Import Ambition



- **REPowerEU Goal:** 20 million tonnes renewable hydrogen by 2030 - **10 Mt domestically produced**, **10 Mt imported**.
- **By 2050:** North Africa could supply **~18% of EU hydrogen demand**.
- **Why SMCs Matter:** Lowest production costs + proximity + existing gas infrastructure.

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Southern Mediterranean: Resource and Location Advantages

High Solar Potential

High solar and wind potential: Solar irradiance >5.5 kWh/m²/day.

Geographic Proximity

Pipelines and short shipping routes.

Existing Infrastructure

Gas pipelines and ports adaptable for H_2/ammonia.

Emerging Corridors

SouthH_2 Corridor (Tunisia/Algeria–Italy–Austria–Germany).

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Key National Ambitions

- **Algeria:** 10 GW electrolyzers by 2040; 30–40 TWh exports (~1 Mt H_2). SouthH_2 Corridor in development.
- **Egypt:** >USD 80 billion green hydrogen/ammonia projects; EU–Egypt partnership.
- **Morocco:** Early mover (2021 GHR); export-oriented; Maghreb-Europe Pipeline, EU-Morocco Green Partnership.
- **Tunisia:** Export target of 8 Mt H_2 by 2050; ELMED cable to Italy, SouthH_2 Corridor in development

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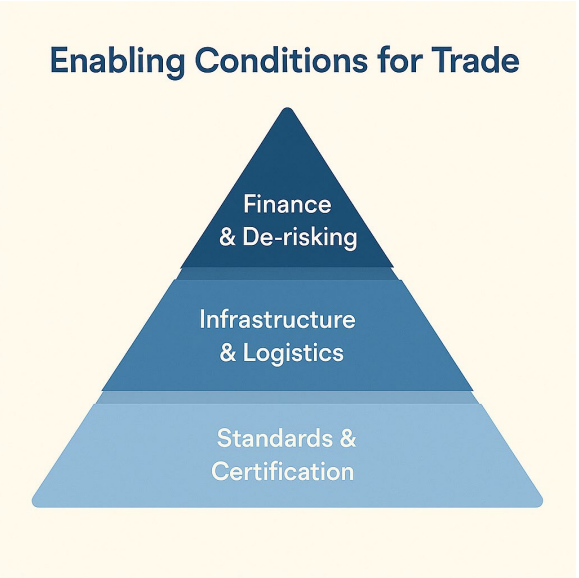
Enabling Conditions for Trade



1. Standards & Certification

- Mutual recognition of Guarantees of Origin (GoO), Certification Schemes,….
- Alignment with International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) hydrogen sustainability criteria, EU regulations (RFNBOs)

2. Infrastructure & Logistics

- Cross-border pipelines, ports, and hydrogen-ready power grids.
- Integration with Trans-Mediterranean Energy & Clean Tech Initiative (T-MED) for regional interconnection planning.

3. Finance & De-risking

- Lower Weighted Average Cost of Capital (WACC) through blended finance and European Union (EU) instruments.
- Public–private partnerships and guarantees for infrastructure investment.
- Support via Mediterranean Pact for clean energy diplomacy and funding alignment.

Key Drivers

- **Carbon Pricing & CBAM:** Drives green hydrogen & its derivatives uptake for exports.
- **H2Global & Import Contracts:** Offer guaranteed demand for SMC producers.
- **Trade Facilitation:** WTO/IRENA call for reduced tariffs and harmonized safety rules.
- **Regional Cooperation:** Align standards, certification, and investment strategies.

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Benefits & Outlook

- **For Europe:** Reliable renewable energy imports, decarbonization of Hard to abate sectors, Climate Change Goals.
- **For SMCs:** Economic diversification, job creation, and green industrialization.
- **For the Region:** Stronger EU–SMC cooperation, energy security, climate alignment.

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Expanding Opportunities Across the Mediterranean

Regional Integration & Policy Coherence

- *T-MED* aligns national hydrogen and electricity infrastructure plans under a unified Euro–Mediterranean framework.

- *The Mediterranean Pact* elevates clean energy and hydrogen to a core pillar of EU–Southern Neighborhood cooperation.

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Key Takeaways

- **Hydrogen** trade is the **next chapter of Euro-Med energy cooperation**.
- SMCs' renewable potential offers a **mutual decarbonization opportunity**.
- **Standards, finance, and infrastructure** are pivotal enablers.
- MED-GEM plays a critical role in bridging **policy, industry, and investment**.
- **Priority Steps:**
  - ✓Certification & regulatory frameworks.
  - ✓Accelerate infrastructure investment.
  - ✓Secure offtake agreements & pilot shipments.

Thank You • Merci • شكرًا

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