

# Landscape of Low-Carbon Hydrogen Market: a MENA perspective

*Dr. Nasser Saidi*

*Clean Energy Business Council*

*19 January 2022*

Clean  
Energy  
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# CEBC: a Regional NPO & NGO promoting Clean Energy & Technology

A NPO, NGO membership organisation

Work on behalf of members to promote investment & adoption of renewable and clean technologies through public-partnerships

Establish a dialogue between the public and private sector



Represents the private sector involvement in Clean Energy & Technology across the MENA region

Helps drive the development of policy and regulations to support the clean energy sector in MENA

Undertakes research, develops and presents policy solutions

Public and private sector dialogue

HYDROGEN AND ENERGY STORAGE  
Working Group

WOMEN IN CLEAN ENERGY  
Working Group

ENERGY EFFICIENCY  
Working Group

FUTURE MOBILITY CLUB

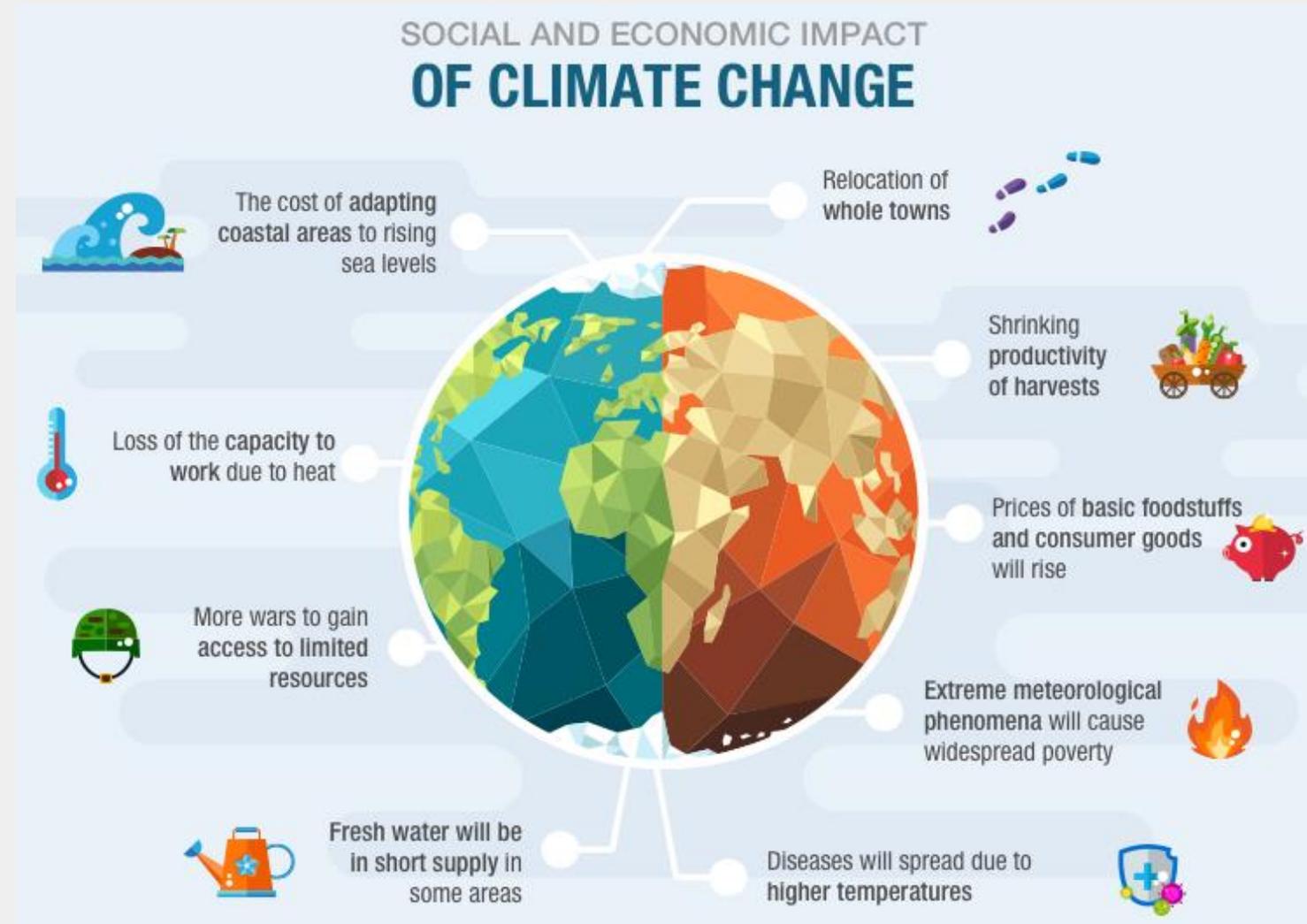
# Addressing climate change will change geoeconomy & geopolitics

Climate change is being recognized worldwide as a **growing & imminent existential threat** => **needs immediate action, risk mitigation and adaptation**

Combating climate change is a **Global Public Good** requiring concerted action

Countries around the globe, especially **oil exporting states** (esp. GCC) need to **reexamine their economic strategies and adapt** to the changing landscape & energy transition.

**Transition to sustainable energy systems** => boost demand for hydrogen and hydrogen-based fuels



# Hydrogen market is in its infancy: need to nurture the foundations of a well-defined market

## Key policy recommendations for Hydrogen Market

Develop strategies & roadmaps on hydrogen's role in energy systems

Create strong incentives for using low carbon hydrogen to replace fossil fuels

Mobilize investment in production assets, infrastructure & factories

Provide strong innovation support to ensure critical tech reaches commercialisation quickly

Establish appropriate certification, standardization, & regulatory regimes

International trade in hydrogen will be a vital part of the hydrogen supply chain

The large-scale deployment of **green hydrogen** will require the establishment of an **organised hydrogen market**, at the local, national, and global levels

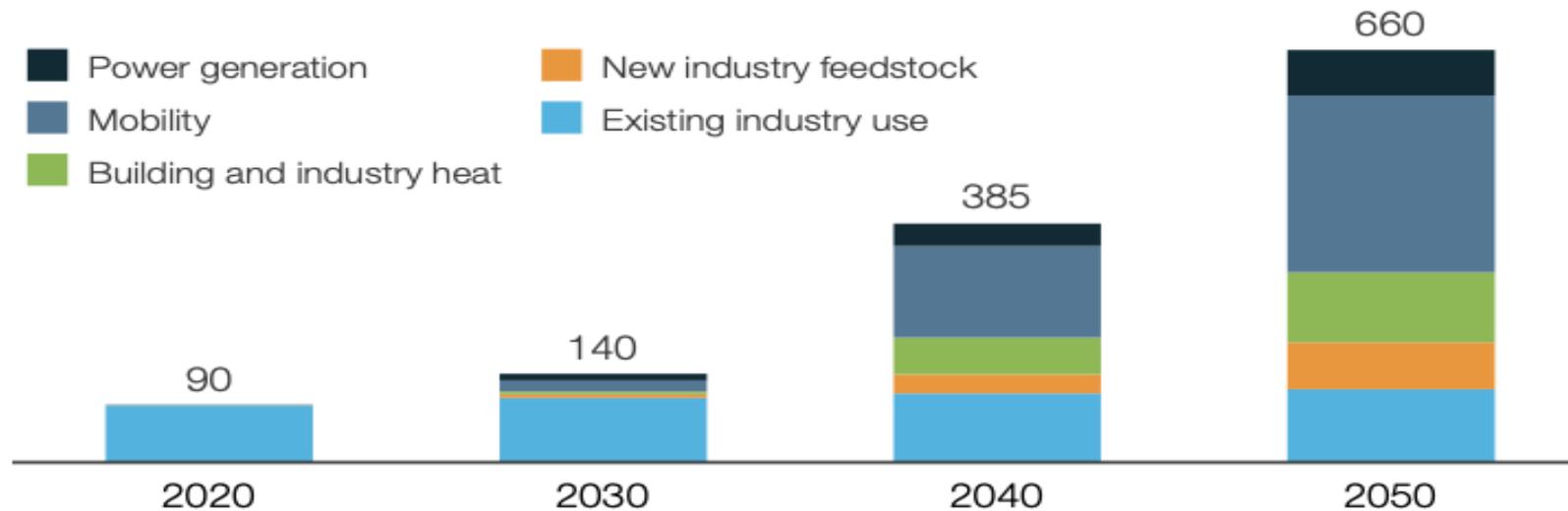
Source: IEA

# Hydrogen share in Energy

[Hydrogen Council & IEA](#): With annual abatement potential of 7 GT in 2050, hydrogen can contribute 20% of the total abatement needed in 2050. This requires the use of 660 million metric tons (MT) of renewable and low- carbon hydrogen **in 2050**, equivalent to **22% of global final energy demand**.

## Exhibit 3 – Global hydrogen demand by segment until 2050

Hydrogen end-use demand by segment, MT hydrogen p.a.



**660 MT**

hydrogen required  
p.a. in 2050 for  
net-zero

**22%**

of global final  
energy demand<sup>1</sup>

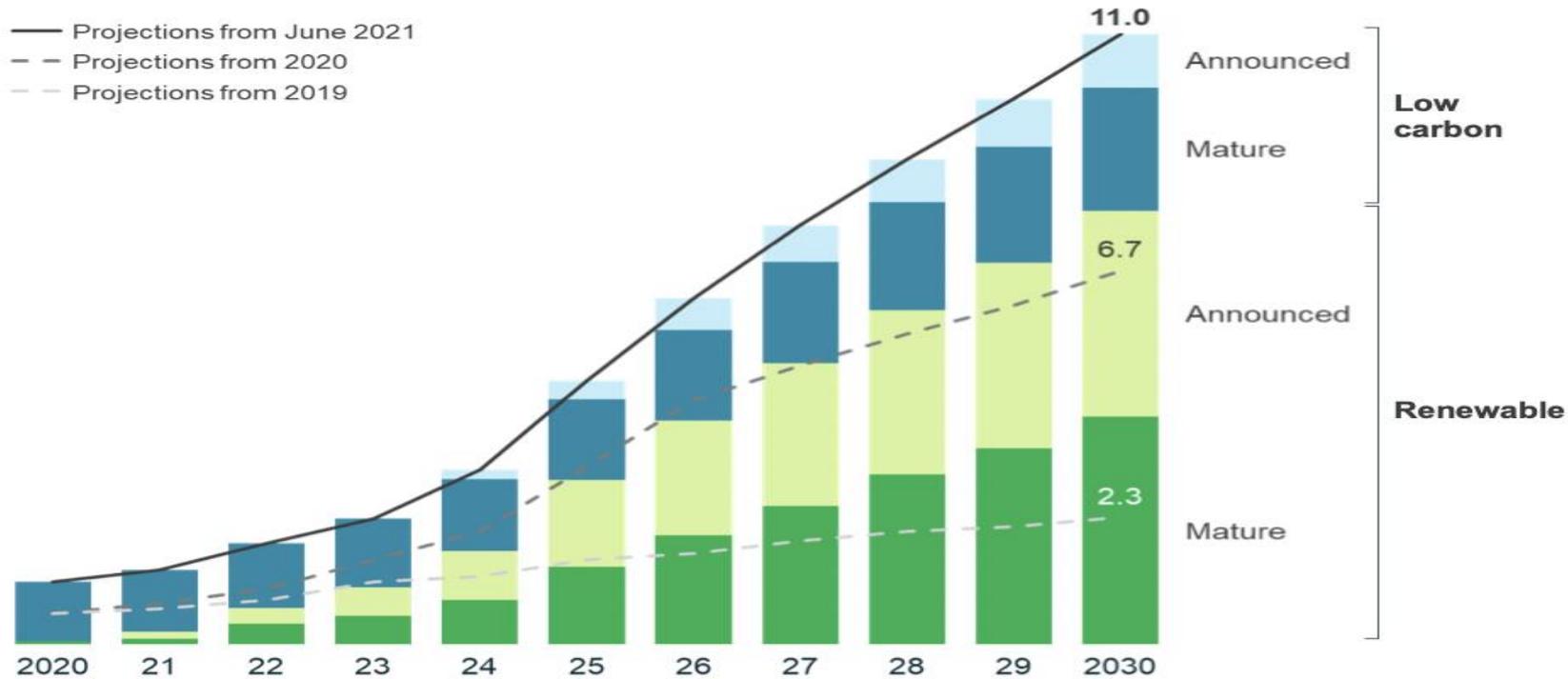
1. IEA net-zero scenario with 340 EJ final energy demand in 2050. HHV assumed. Excluding power.

# Potential Hydrogen globally? But beware of H exuberance

## Exhibit 2: Announced clean hydrogen capacity through 2030

Cumulative production capacity, Million tons p.a.

- Projections from June 2021
- - Projections from 2020
- - Projections from 2019



**>60%**  
increase in capacity  
announced in the past 5 months

**69 GW**  
clean hydrogen capacity  
by 2030 announced

**+7.7 Mt**  
additional capacity  
(low carbon and renewable)  
announced for post-2030

Hydrogen Council, July 2021

# Nascent state of the hydrogen market: unanswered questions.



## Q1. Is there sufficient demand?

A budding interest in green hydrogen, but no real demand for products made using green hydrogen – such as green steel or green ammonia

## Q2. How is hydrogen traded?

Mostly through **bilateral agreements** between companies; NO public trading and pricing

**Negatively affects international trade opportunities** for nations with a high potential for green hydrogen production & export (esp. GCC w/ low domestic hydrogen demand + consumption)

## Q3. How about infrastructure? A chicken & egg problem!

Without a clear understanding on consumption of hydrogen, infrastructure development will not move forward

Investments for new grids, repurposing of existing infrastructure or dedicated terminals in ports are **highly capital-intensive activities that require a clear vision** over the points and offtake of green hydrogen



**Bottomline: Policy makers + industry need to address these challenges and barriers**

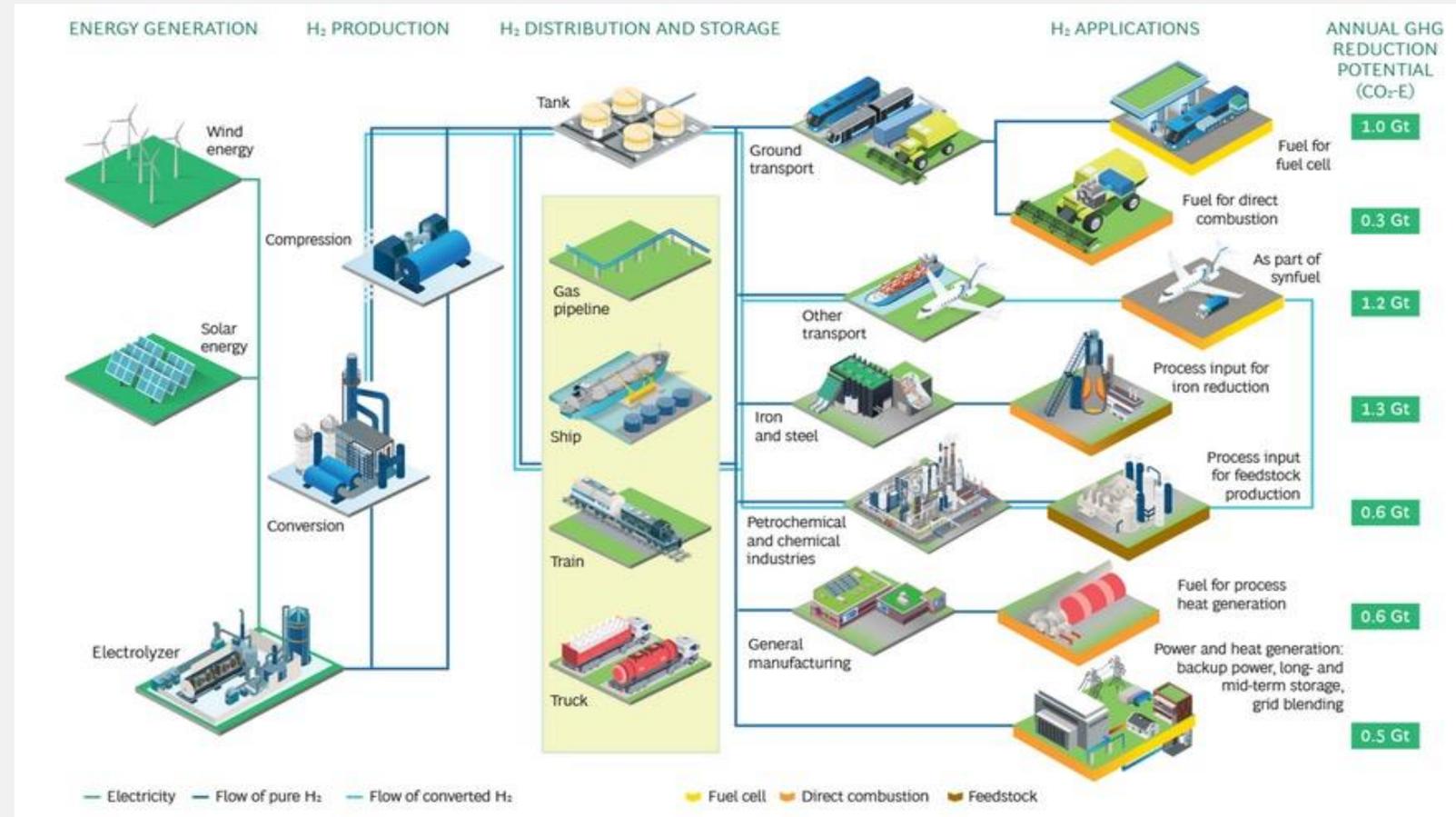
# Imperative that key players collaborate to set, define & implement common standards. What is Green, Blue, Grey and Brown Hydrogen?

How can policy makers address these challenges & barriers?

1. Support the growth of a sustainable hydrogen market: **define & introduce standards + a green hydrogen tracking system**
2. To maintain its long-term health => need **collaboration between governments, industry and technical bodies**

Together 1+2 => **provide an economic stimulus** – key in driving the large-scale deployment of renewable hydrogen

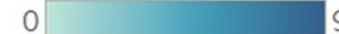
## The Green Hydrogen Ecosystem



Source: BCG analysis

# Hydrogen in MENA: GCC can become a major global exporter

No. of hydrogen projects



**Total Investment in US\$: 55 billion approx.**  
**Total Volume of Green Ammonia in Tons: 5.3 million approx.**

7 July 2021 - Eni and Sonatrach outlined a roadmap for the joint assesment of a green hydrogen pilot project.

- 34.7 million USD
- Key Players: TuNur Ltd.
- Hydrogen Strategy was Announced.

- 4 Billion USD
- Key Players: MAN Energy Solutions, Taqa Power, DEME, Siemens, EEHC.
- Hydrogen Strategy was Announced.

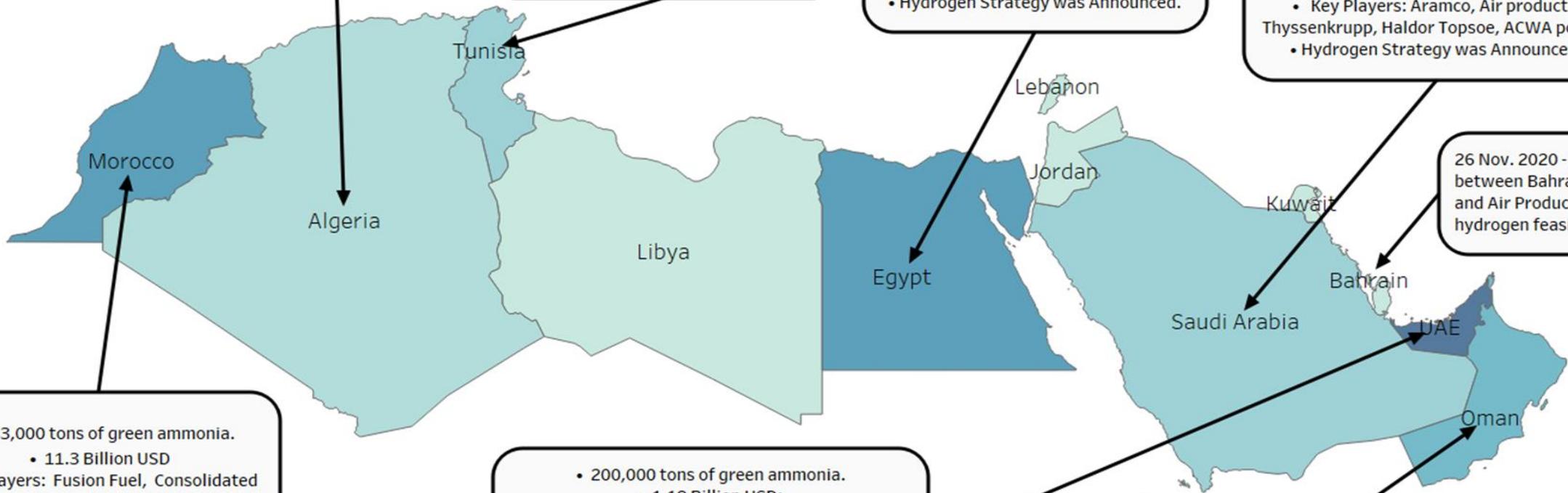
- 1.2 million tons of green ammonia.
- 5 Billion USD
- Key Players: Aramco, Air products, Thyssenkrupp, Haldor Topsoe, ACWA power.
- Hydrogen Strategy was Announced.

26 Nov. 2020 - MoU signed between Bahrain's NOGA and Air Products for green hydrogen feasibility study.

- 200,000 tons of green ammonia.
- 1.18 Billion USD:
- Key Players: DEWA, Abu Dhabi National Energy Co., Abu Dhabi Ports, Bee'ah, Chinook Sciences, Masdar, Siemens, Marubeni, Helios Industry, Thyssenkrupp.
- Hydrogen Strategy was Announced.

- 3.7 million tons of green ammonia.
- 33.5 Billion USD
- Key Players: OQ, InterContinental Energy, Enertech, Uniper SE, DEME, OQ Alternative Energy, Helios Industry, ACME Group.
- Hydrogen Strategy was Announced.

- 183,000 tons of green ammonia.
- 11.3 Billion USD
- Key Players: Fusion Fuel, Consolidated Contractors Group (CCC), MEME, MASEN, IRESEN, Saipem, Alboran Hydrogen, ONEE.
- Hydrogen Strategy was Announced.



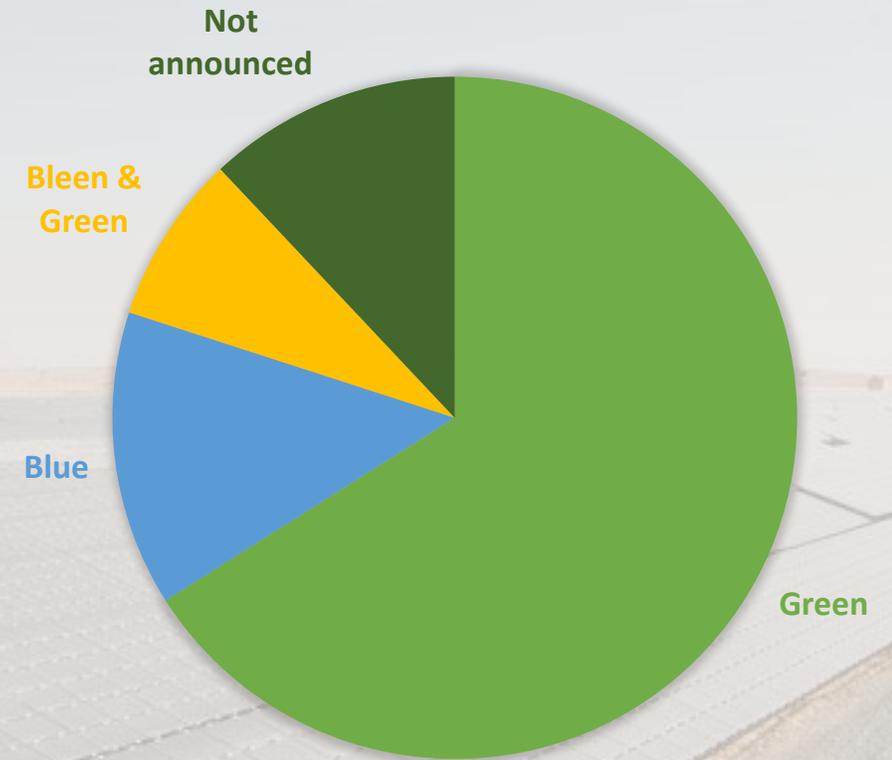
# Hydrogen in MENA: 47 projects, total investment \$55bn, 5.3 mn tons

Total number of announced low carbon hydrogen projects in MENA

■ Number of announced projects



### COLOR OF ANNOUNCED H2 PROJECTS



# GCC countries need to prepare themselves for an EU carbon border tax & Global Energy Transition

The **EU commission presented plans for the world's first carbon border tax on imports** on carbon intensive products (steel, aluminum, cement, fertilizers...) to help meet its new climate target + become world's first climate neutral continent

**Border levy should come into action gradually starting in 2023;** designed to protect European industries from competitors abroad whose manufactures are not charged for its carbon output.

For the **Gulf** (producer of large quantities of steel, aluminium, fertiliser, electricity, cement - all of which will be taxed under the new EU legislation) **now is the time to shift gears and ensure the industries are equipped to deal with this change**

A tax on carbon emissions tied to imports => **↓ profits** for foreign suppliers of oil and steel & other goods with high GHG footprint => **essential that GCC companies manage their carbon footprints with greater urgency**

**Imperative that GCC nations recognize the impact of carbon border tax & take necessary steps to decarbonize**

GCC future target to reduce CO<sub>2</sub> emissions

Country	Target	Year
Saudi Arabia	Reduce power consumption by 8%	2021
	Reduce peak demand by 14%	2021
Oman	Reduce greenhouse gas (GHG) emissions by 2%	2030
	Reduce the power consumption in Dubai by 30%	2030
UAE	Reduce power consumption by 40%	2050
	Improve the efficiency for corporates and individuals by 40%	2050
	Reduce the electricity generation carbon footprint by 70%	2050
Kuwait	Reduce power consumption by 30%	2030
Qatar	Improve power generation efficiency by 15%	2030
Bahrain	Reduce the per-capita power consumption by 8%	2022
	Reduce the power consumption by 6%	2025

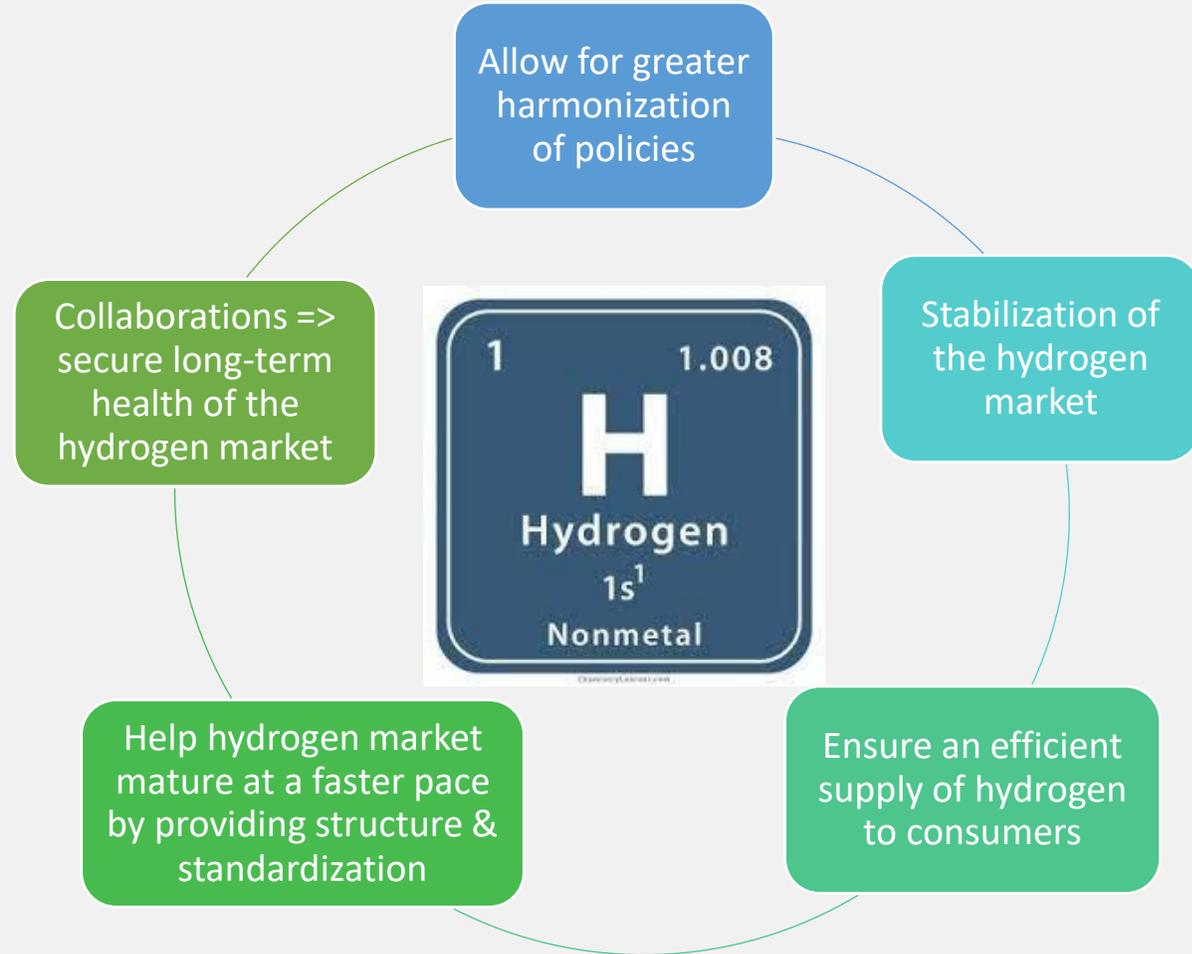
Source: GCC Countries Climate Change Mitigation Challenges & Exploration of Solar & Wind Energy Resource Potential, Applied Sciences (2021)

# Renewable Energy/Hydrogen exporters should form an organisation/alliance. How and why?

Time to work towards establishing a Clean/Renewable energy producers and hydrogen exporters organisation: an OREEC or OCEEC

## Mission & Vision:

1. Cooperate to promote the development of an organised, sustainable hydrogen market
2. Work together to identify common ground between producers and consumers
3. Support intergovernmental organisations to work towards removing barriers & expanding the hydrogen market



## **Some takeaways: Hydrogen Energy promising but a long way to go for it to become mainstream**

- **Global Hydrogen market is still in its infancy: need to build the foundations of a sustainable market**
- **Develop strategies & roadmaps on hydrogen's role in energy systems**
- **Hydrogen can become an important component of the energy transition and decarbonisation policies, accounting for 22% of final energy use by 2050**
- **Hydrogen in MENA: 47 projects, total investment \$55bn, 5.3 mn tons**
- **GCC can become major producers and exporters of hydrogen helping to de-risk their fossil fuel assets**
- **Renewable/Clean Energy producers should form an alliance/organisation to develop the industry and market**

# Thank you

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