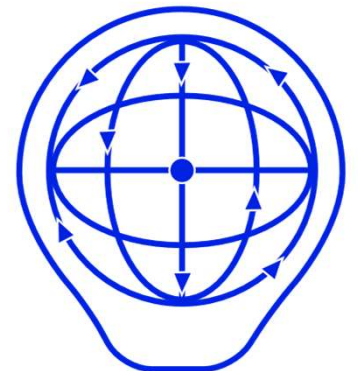


Netherlands Innovation Network

Connecting Innovation Worldwide

Hydrogen Economy – Status in
MENA and Challenges

Racheli Kreisberg, PhD, racheli@nost.org.il



Netherlands
Innovation
Network

Who am I?

- ▶ Born in NL and immigrated to IL
- ▶ EU collaborative research projects (2004-2017)
 - ▶ EU & MENA projects
- ▶ Innovation Attaché, NL embassy in IL (2016-)
- ▶ Founder & manager Israeli Dutch Innovation Center (2016-)





Innovation Attache Activities

- ▶ Develop bilateral innovation opportunities
 - ▶ Organize missions to and from NL
 - ▶ Scout for IL technology for NL MultiNationals (MNEs)
 - ▶ Search for NL and/or IL partners for EU projects
 - ▶ Transfer knowledge between NL and IL
- 



Focus

Hydrogen Economy – Status in MENA and Challenges

NL IL Hydrogen Activities in Israel 2020-2023

- ▶ Basic H₂ course (Sep 2020) & Dutch Israeli Mini Symposia (2021)
- ▶ Dutch Hydrogen Valley (H₂V) Summer School (August 2021)
- ▶ IL H₂ delegation to NL (May 2022)
- ▶ Horizon Europe and FCH-JU calls (small-scale H₂V) (April 2023)
- ▶ NL H₂ delegation to IL (June 2023)
- ▶ Israeli Women in Green Hydrogen event (June 2023)



Outline

P - **P**olicy

Y - **Y**outh

R - **R**evenue

A - **A**greements

M - **M**obility

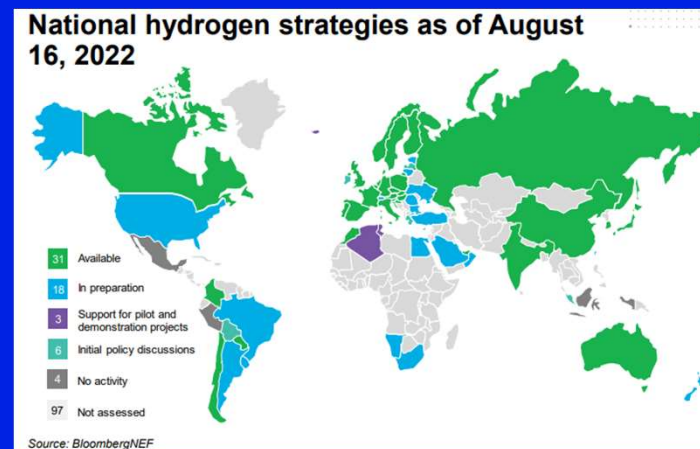
I - **I**nnovation

D - **D**evelopment



Global Hydrogen Policy

- ▶ Hydrogen can play a crucial role in the energy transition through public private partnerships
- ▶ National, regional and international hydrogen strategies can set clear targets for 2025, 2030, 2040, 2050,



EU Hydrogen Policy

- ▶ REPowerEU aims at reducing dependence on Russian fossil fuels and speeding up the green transition
- ▶ REPowerEU sets 2030 targets of
 - ▶ 10M tonnes of domestic production
 - ▶ 10M tonnes of imports



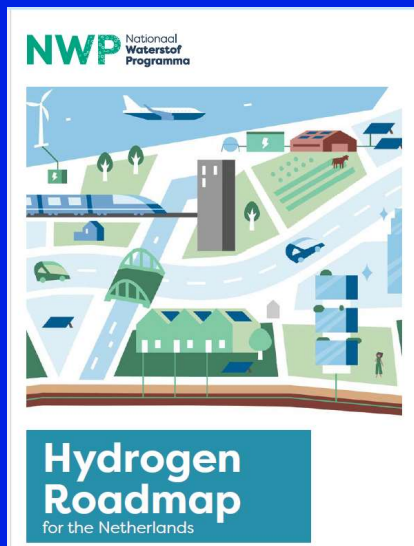
NL Policy - Energy

- ▶ Energy transition - societal challenge
- ▶ Energy top sector - public private partnership
- ▶ Energy targets - mission Driven Innovation Policy
 - ▶ 55% reduction of national greenhouse gas emissions by 2030
 - ▶ An entirely carbon-neutral / climate neutral electricity system by 2050
 - ▶ A carbon-neutral / climate neutral built environment by 2050
 - ▶ Carbon-neutral industry with reuse of raw materials (circular economy)
 - ▶ Zero-emission mobility of people and goods by 2050
 - ▶ A sustainable and completely circular economy by 2050, with resource use halved by 2030



Dutch Hydrogen Policy

- ▶ NL develops a clear hydrogen roadmap
- ▶ Ports of Rotterdam and Amsterdam to import hydrogen, store, transport and use



MENA Hydrogen Policy

- ▶ MENA countries develop hydrogen roadmaps
- ▶ EU's import needs develop MENA's H2 opportunities
 - ▶ Producing large amounts of green H2
 - ▶ Serving as corridor between Gulf Countries and EU



Figure 1. Overview of current green hydrogen initiatives in Morocco (IRESEN)



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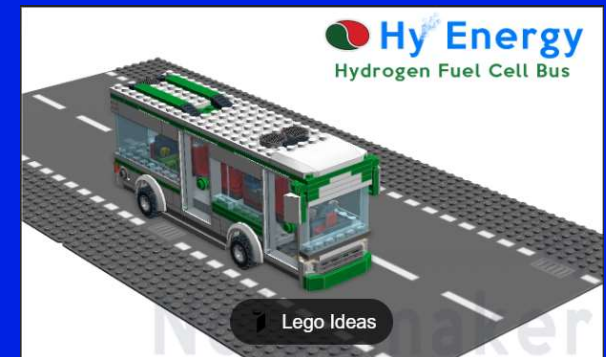
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Youth and Hydrogen

- ▶ Hydrogen is the energy carrier of the future
- ▶ R&D, education, training, jobs, etc. should focus on youth and young generation



Outline

P - Policy

Y - Youth

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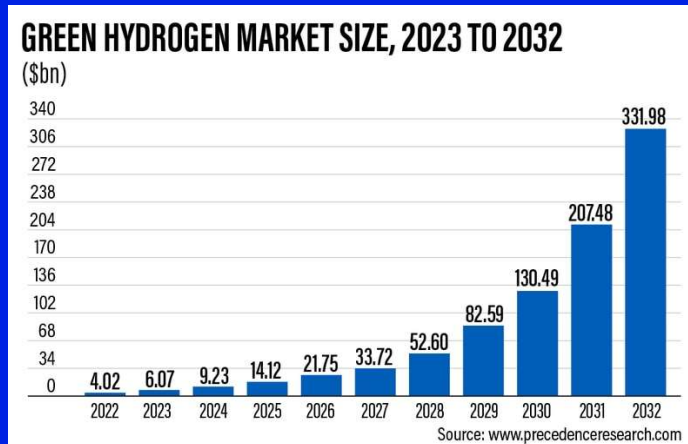
I - Innovation

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Revenue

- ▶ The worldwide hydrogen market size
 - ▶ currently equals US\$185 Bn
 - ▶ is expected to reach revenue of US\$328 Bn toward end of 2030, 40% of which is green (US\$ 130.49 Bn)



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Agreements 2022

- ▶ EU Commission President Ursula von der Leyen signed a MoU of the EU with Egypt and Israel to allow 'significant' exports of Israeli gas to Europe (June 2022)



- ▶ Gasunie (NL) to develop IL's hydrogen infrastructure (Aug 2022)

Agreements 2023

- ▶ NL signed MoU with Saudi Arabia during WHS (May 2023)
- ▶ NL signed €300M investment fund with Morocco (June 2023)



Outline

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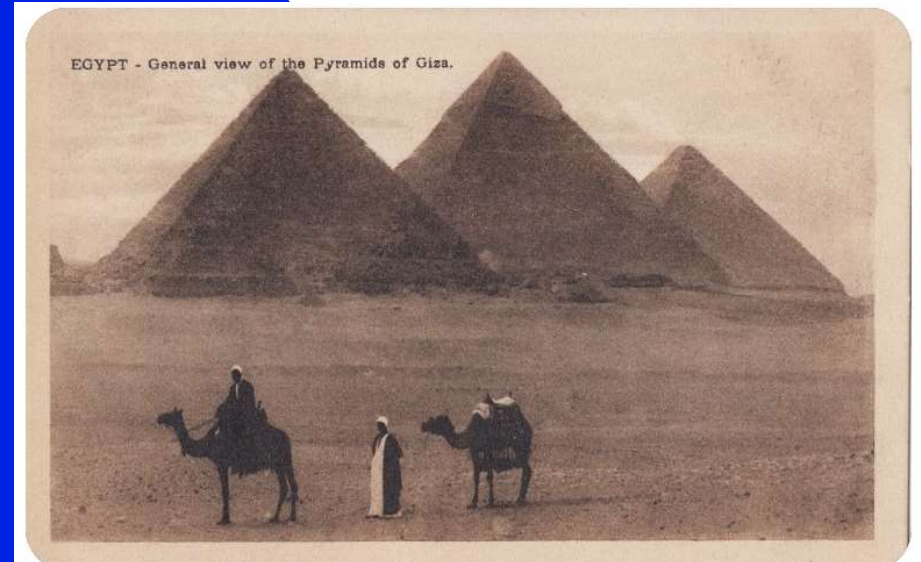
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Mobility – Land Transportation

- ▶ Heavy mobility in Israel
 - ▶ Sonol, Bazan and Colmobil establish Hydrogen Refueling Station and purchase three Heavy hydrogen trucks (May 2023)
- ▶ Hydrogen car production in Morocco
 - ▶ First “Made in Morocco” car brand presented to King Mohammed VI (May 2023)



Morocco Unveils First Moroccan Car Brand, Hydrogen Vehicle Prototype

The projects, developed by Moroccan entrepreneurs, are a significant milestone for the country and will strengthen the “Made In Morocco” label.

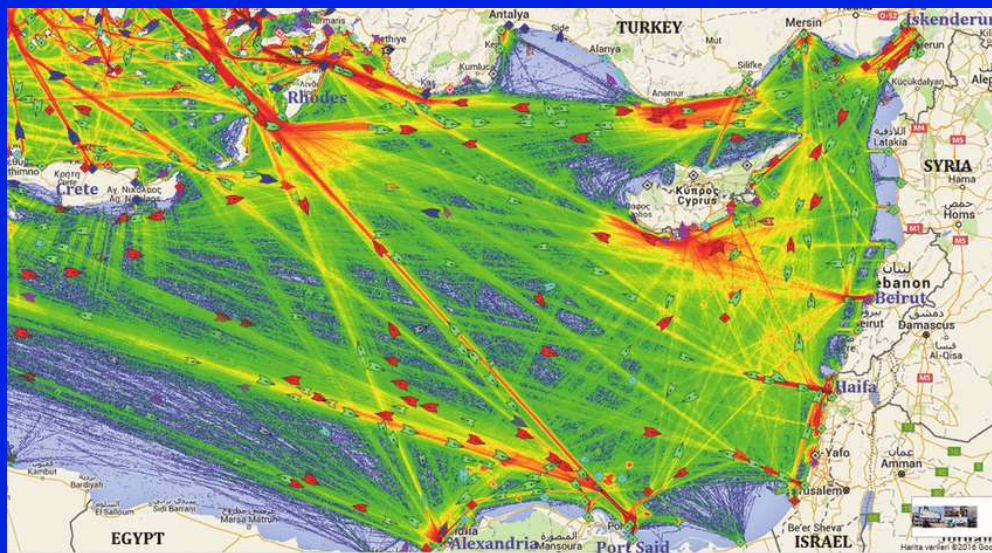
Jihane Rakhou May 15, 2023 8:14 p.m.



Faouzi Anamjah presented a model of the first Moroccan car brand and a hydrogen-powered vehicle prototype to King Mohammed VI

Mobility - Maritime Transportation

- ▶ Cyprus: Refueling of ships travelling in the Mediterranean basin



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Innovation

- ▶ Israeli startups
 - ▶ Green H2 production (H2Pro, Hydrolite, QD-Sol)
 - ▶ CCUS - Aerovation
 - ▶ NH3 as H2 carrier (GenCell Technology)



Innovation Cooperation

- ▶ H2Pro and Gaia Energy sign agreement to construct a 10 to 20 MW green hydrogen production demonstration plant (COP27)
- ▶ QD-Sol wins Aviram Foundation Startup competition in Morocco for its green quantum hydrogen production technology (May 2023)



QD-SOL wins Aviram Foundation startup competition in Morocco

The Israeli company fights climate change by developing technology to produce green quantum hydrogen. Second place went to Israeli startup Carbon Blue, which removes CO2 from oceans instead of the atmosphere

Andre Tabacof 12.03, 18.05.23



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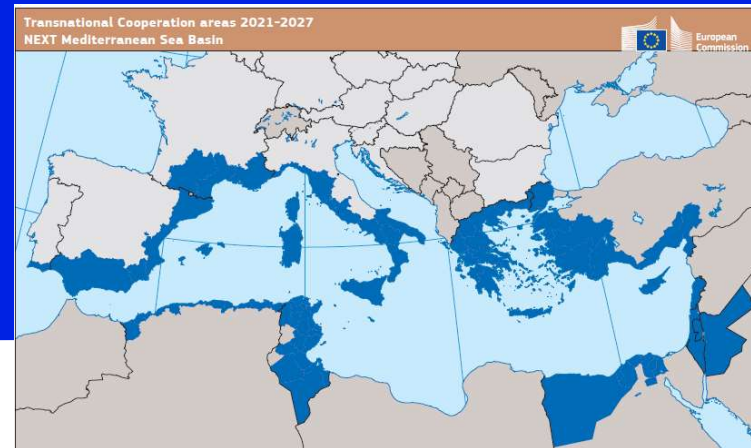
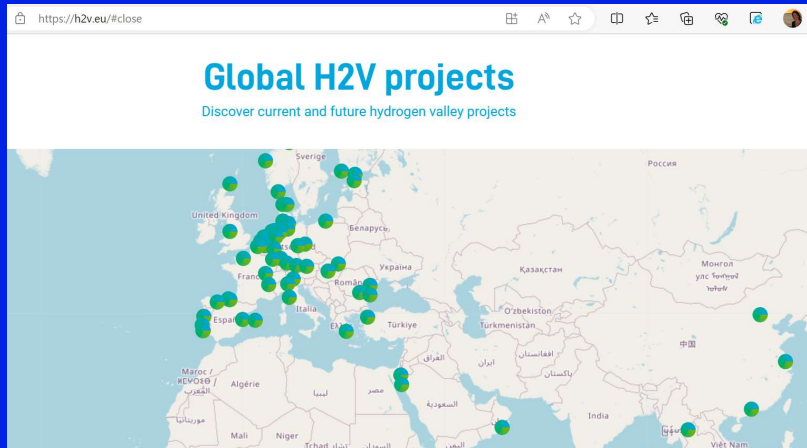
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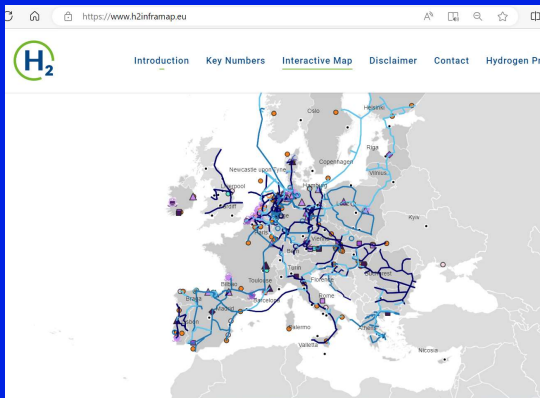
Development

- ▶ Development of joint hydrogen projects are key to success
 - ▶ Regional hydrogen valleys (Eilat Eilat - Egypt - Jordan)
 - ▶ Joint EU projects (Horizon Europe, NEXT Mediterranean Sea Basin)



Development

- ▶ Development of joint hydrogen projects are key to success
 - ▶ Pipelines and maritime transportation of H₂ from MENA to EU
 - ▶ Corridor from Gulf Countries to EU via MENA



Summary and Action Items

- ▶ Key success factors to develop hydrogen economy in MENA
 - ▶ Policy - develop MENA hydrogen roadmap
 - ▶ Youth - engage youngsters in MENA hydrogen economy
 - ▶ Revenue - develop high revenue projects in MENA
 - ▶ Agreements - reach MENA agreements and with EU
 - ▶ Mobility - maritime routes, HRS, trucks and cars
 - ▶ Innovation - scaling of startups, Venture Capital investments
 - ▶ Development - MENA hydrogen valleys, hydrogen corridor GCC

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Dutch Hydrogen 5