Hydrogen Forum - 18 June 2021

HYDROGEN EUROPE

Facilitating deployment of renewable H2

Jorgo Chatzimarkakis
Secretary General

“Hydrogenewables” – A perfect couple

Renewable energy and hydrogen industries are strategic partners

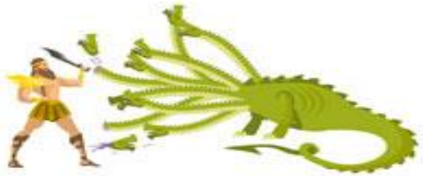
Hydrogen Europe

Images: ELN and ENGIE

A hero is needed to master the transition

12 labours of Hercules

Integrate Renewables



Using existing infrastructure

Safe jobs in affected areas

Make energy transition affordable

Decarb maritime

Decarb aviation

Decarb heavy duty

Decarb steel

Decarb chemicals

Decarb buildings and agriculture

Building a circular economy

Balance energy networks

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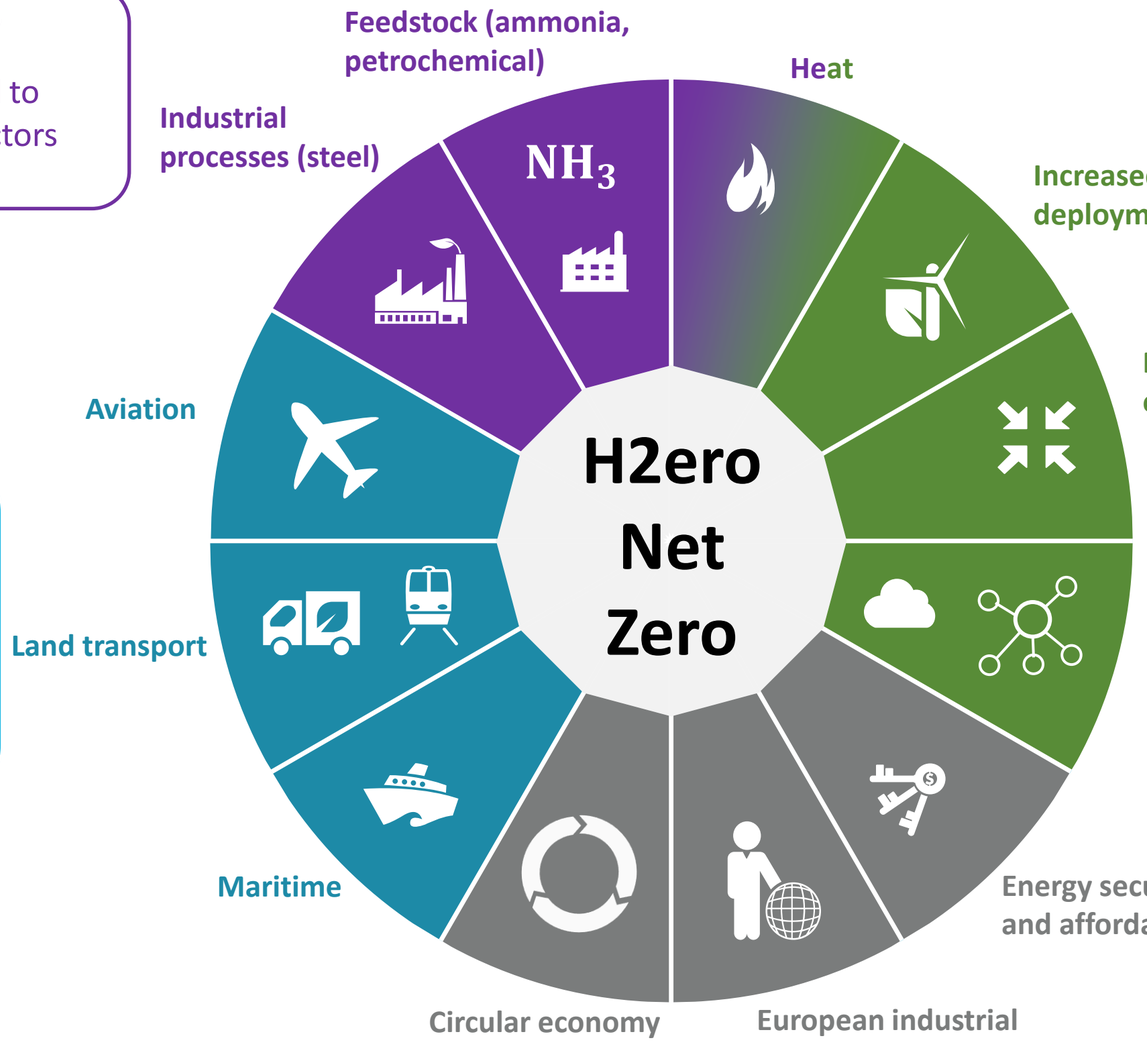
Hydrogen: H2ero Net Zero

Industry

- Decarbonizing “hard to abate” industrial sectors

Transport

- No transport mode left behind
- No compromise (range, refuel time)
- No consumer segments left behind (fleets, long-distance travelers)



Energy

- Making a net-zero energy system possible

Societal

- Ensuring prosperity
- Reducing waste

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Facilitating renewable H2 reduces mineral demand

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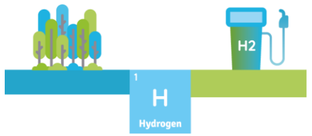


40 GW RE hydrogen power **36 mln FCEV**

RE PRODUCTION

Cu for 40 GW: 384.000t

FCEV (+ ELECTROLYSIS)

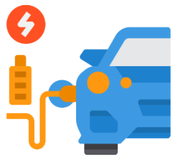
Pt for #36 mln: 1.660t

CRM

REFUELING POINTS

0 critical raw material

ELECTRIFICATION



36mln BEV require **29 GW** of RE

RE PRODUCTION

Cu for 29 GW: 278.000t

BEV

CRM

Li for #36mln: 115.000t

CHARGING POINTS

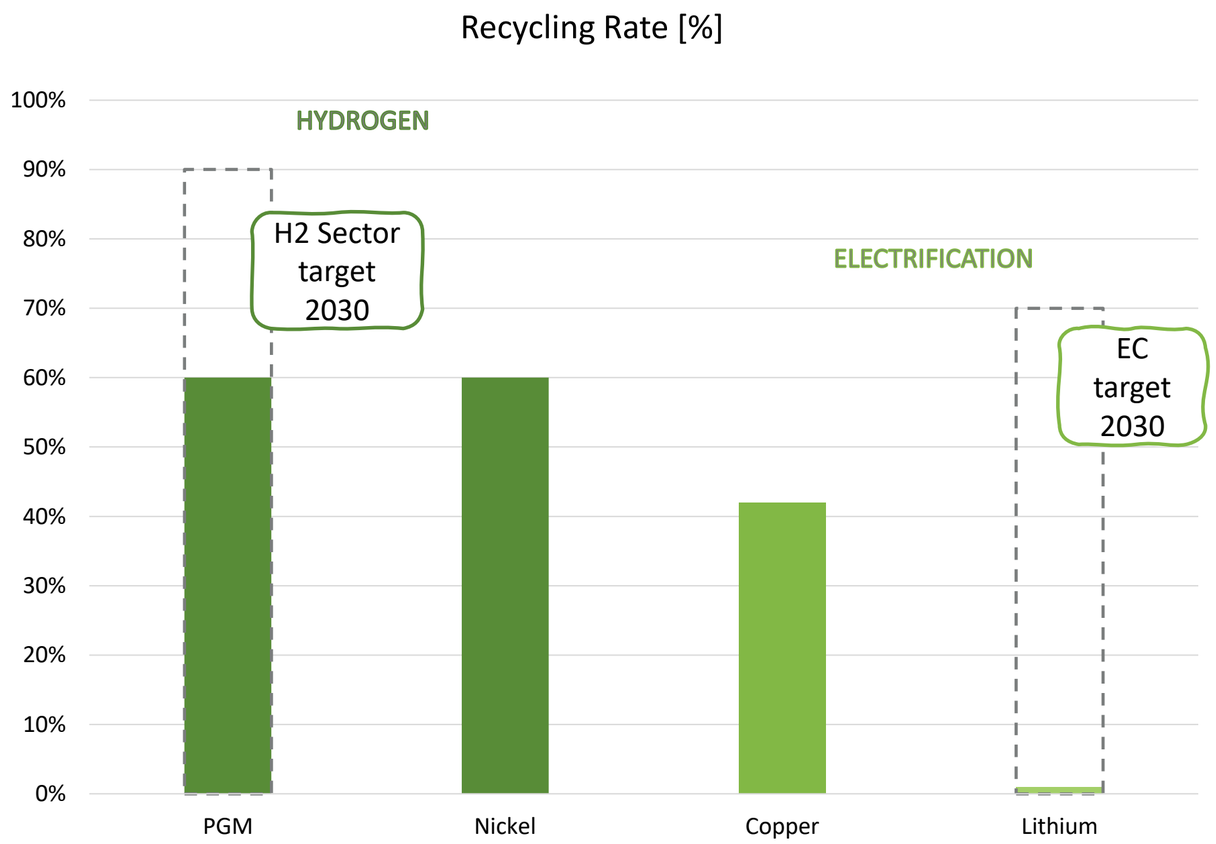
Cu for #360k: 11.500t

The H2 scenario requires **70x less** critical raw material than electrification

Source: Hydrogen Europe

Hydrogen Europe

Facilitating renewable H2 enhances circularity

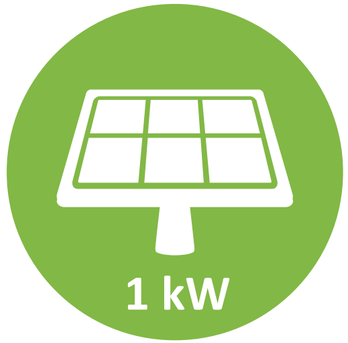


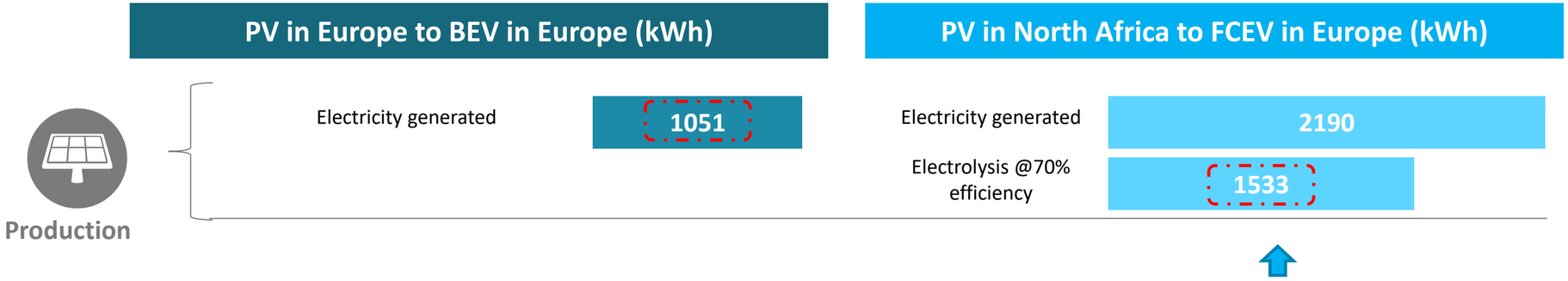
Source: IEA, Hydrogen Europe, T&E

Recycling targets for *critical raw materials* highlight hydrogen as clean technology with much better circularity.

Energy Efficiency – debunking myths

Energy efficiency: you HAVE to start from the REAL INPUT

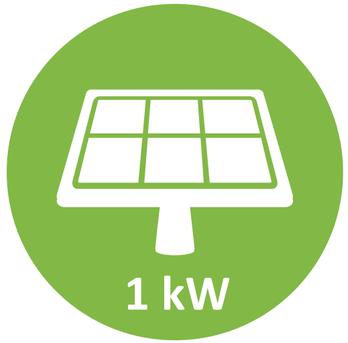




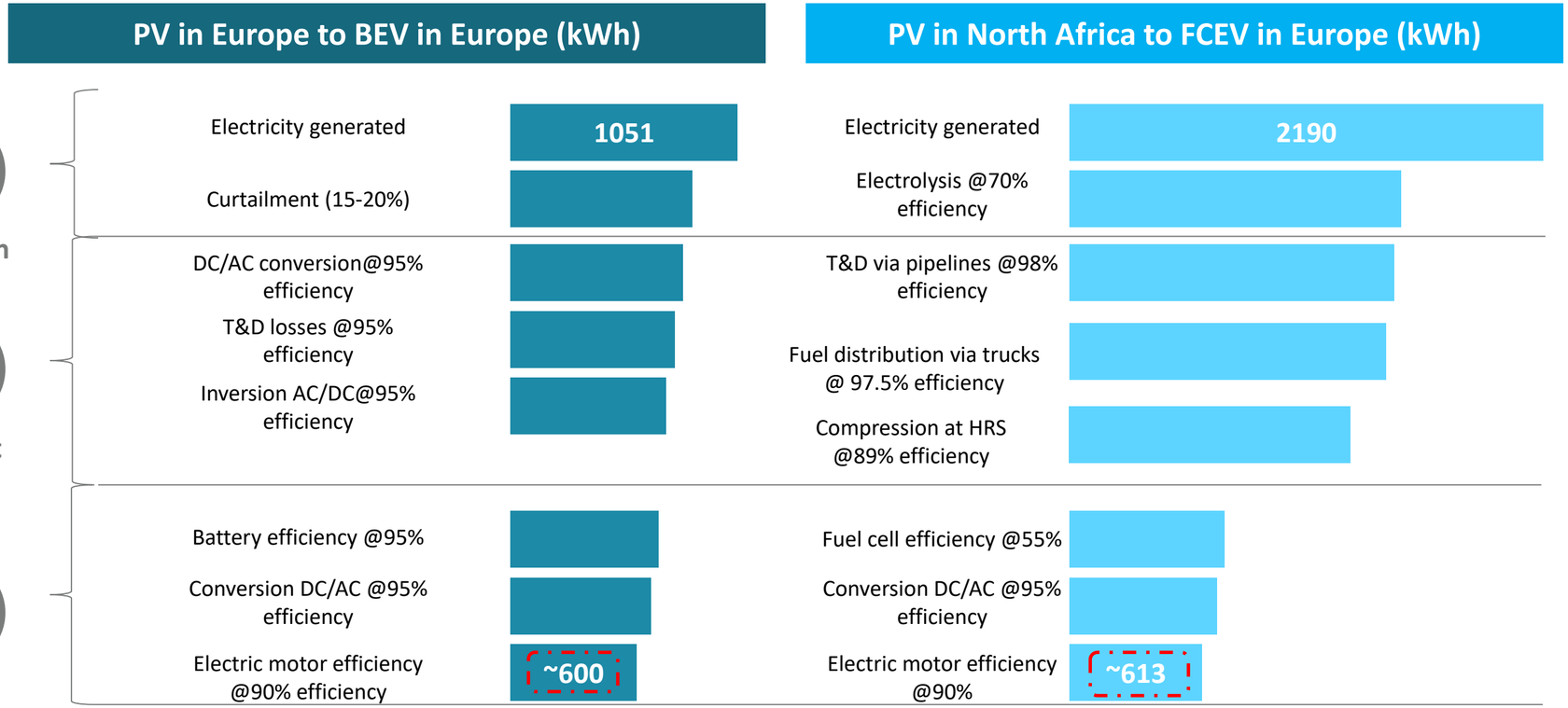
Even with the electrolysis conversion loss, you still have MORE Energy

Energy Efficiency – debunking myths

Energy efficiency: you HAVE to start from the REAL INPUT



Counting all conversion loses, you actually get similar (or even more) useful renewable energy, when using H2 in an FCEV compared to a BEV, if RE is produced in the right conditions!



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Facilitating renewable H2 decreases the prices

Falling electrolyser costs

Economy of scale
Learning curve effects

900 €/kW (2020)	500 €/kW (2030)	150 €/kW (2050)

Falling renewable electricity costs

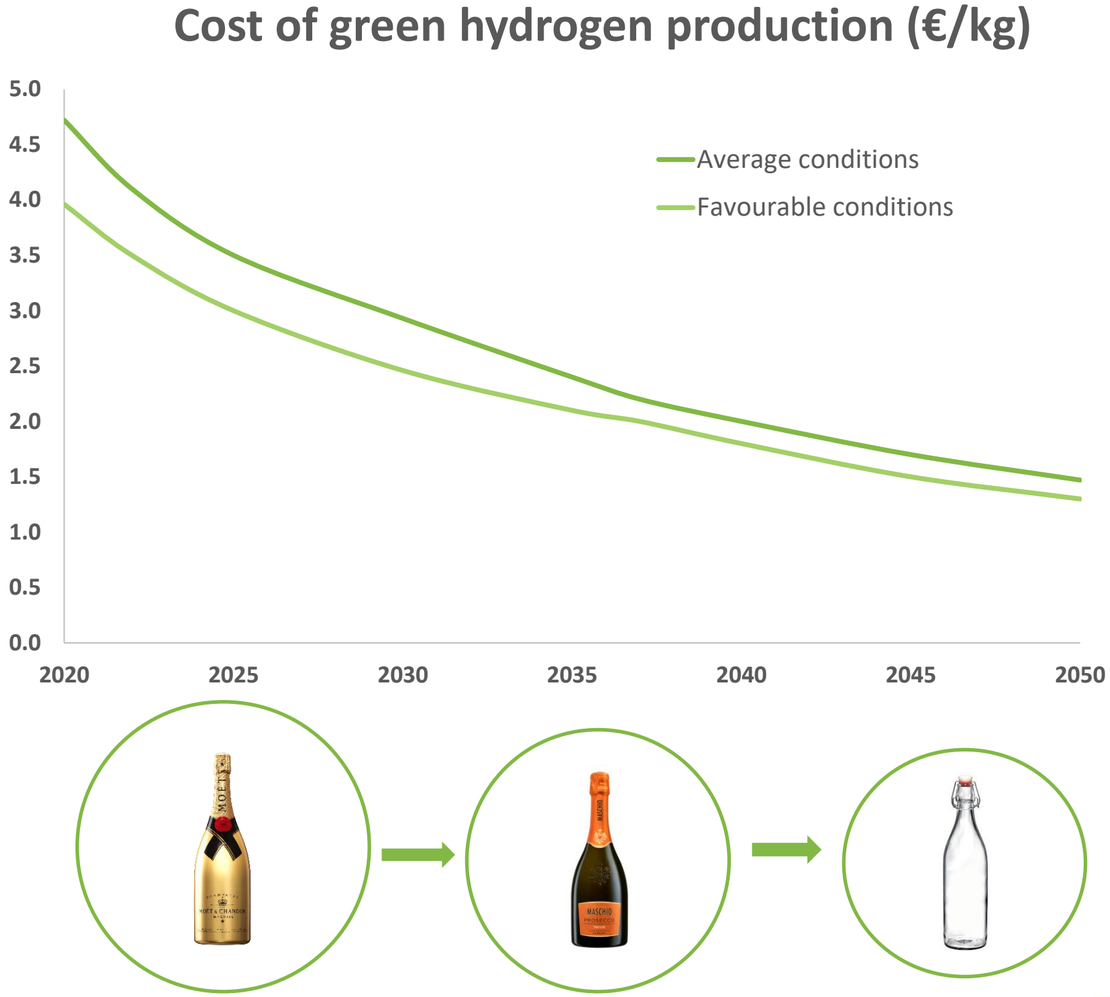
70-90% falling already seen in the last decade

Favourable PV conditions:

50 €/MWh (2020)	17 €/MWh (2030)	12 €/MWh (2050)

Favourable on-shore wind conditions:

37 €/MWh (2020)	25 €/MWh (2030)	17 €/MWh (2050)

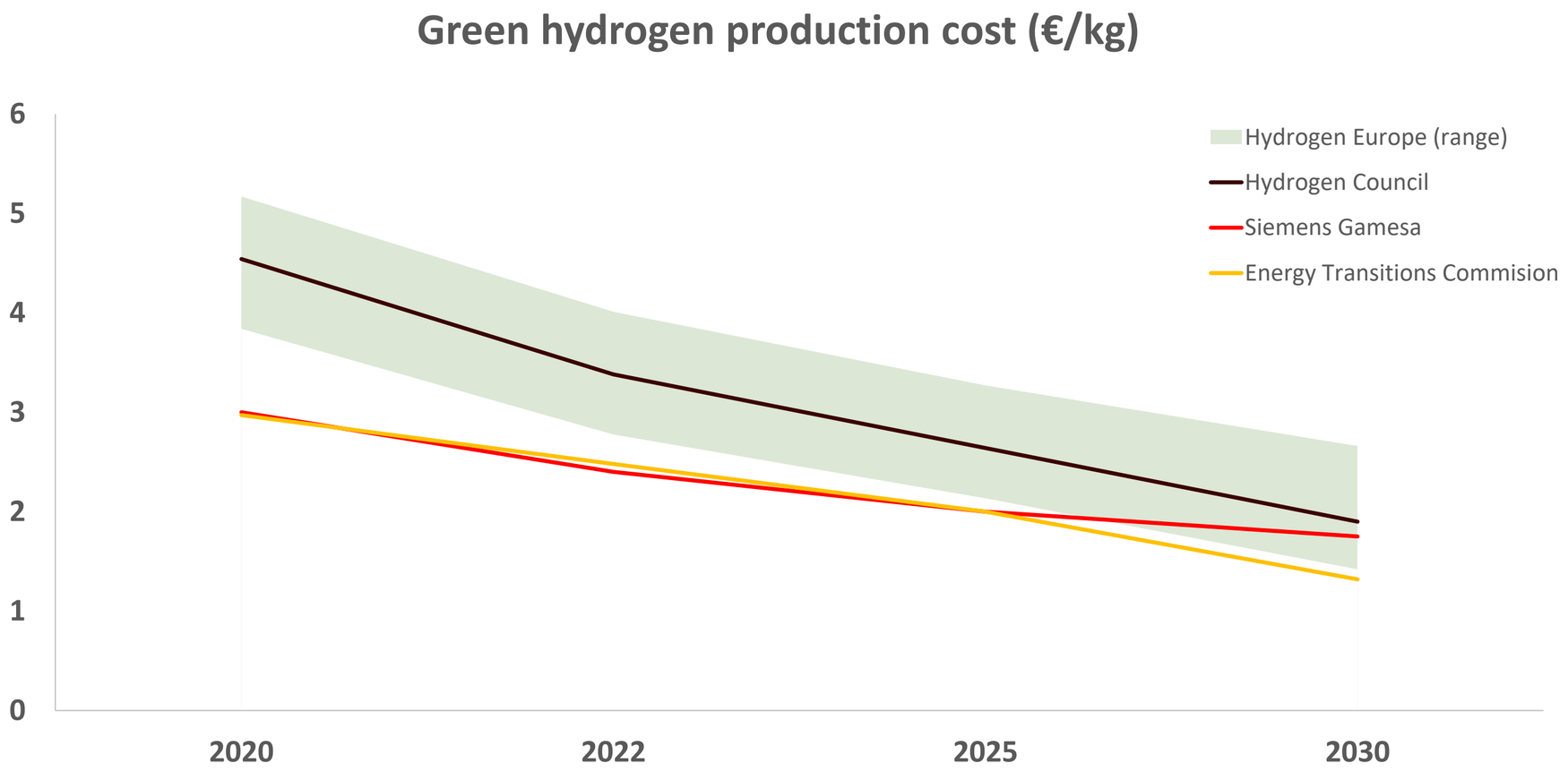


Source (PEM electrolyser costs): Hydrogen Europe, SRIA report, 2020
Source (on-shore wind projections): IRENA, Future of Solar Photovoltaic, 2019

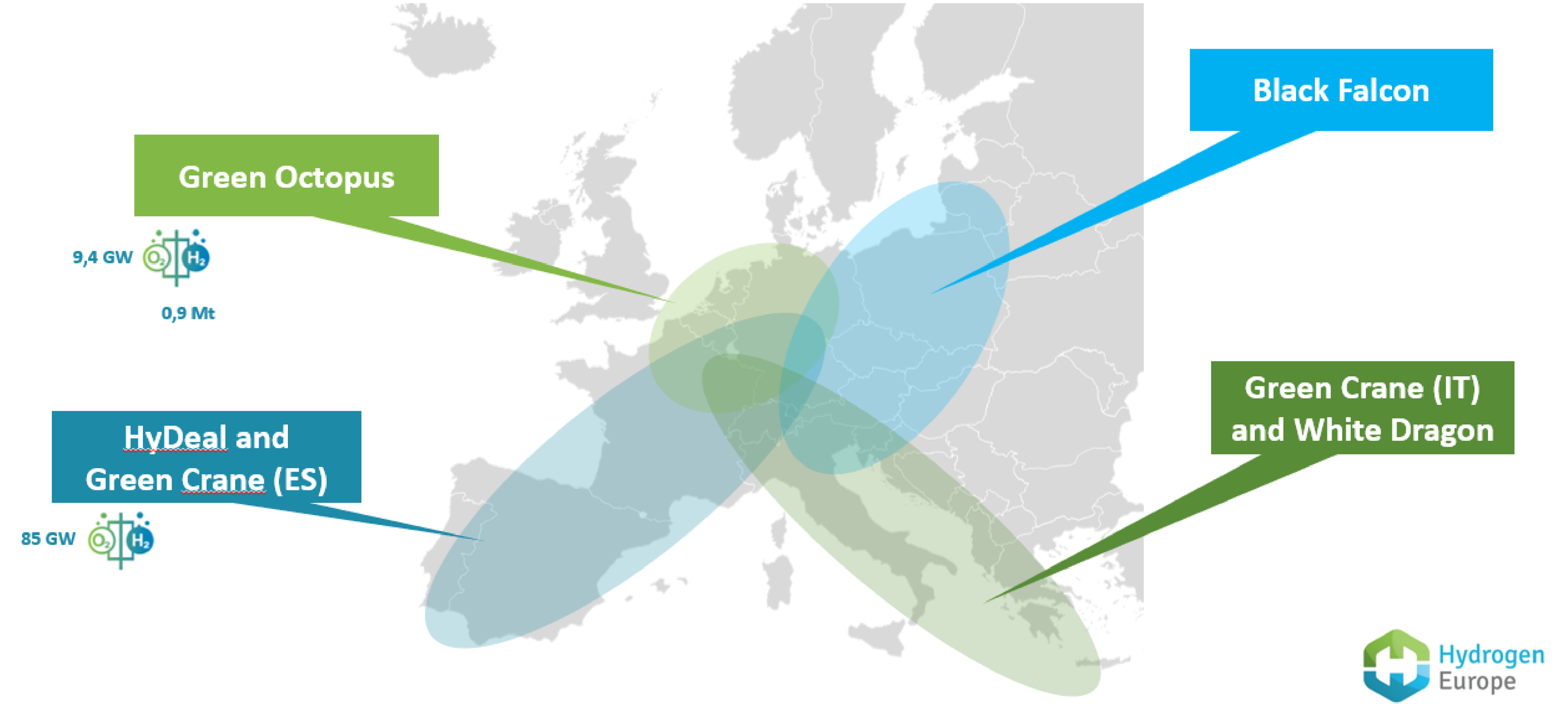
Hydrogen Europe

And it’s not just Hydrogen Europe saying it...

Early growth in demand for clean hydrogen will be critical to accelerate projects in the 2020s.



Flagships projects are developing across the continent

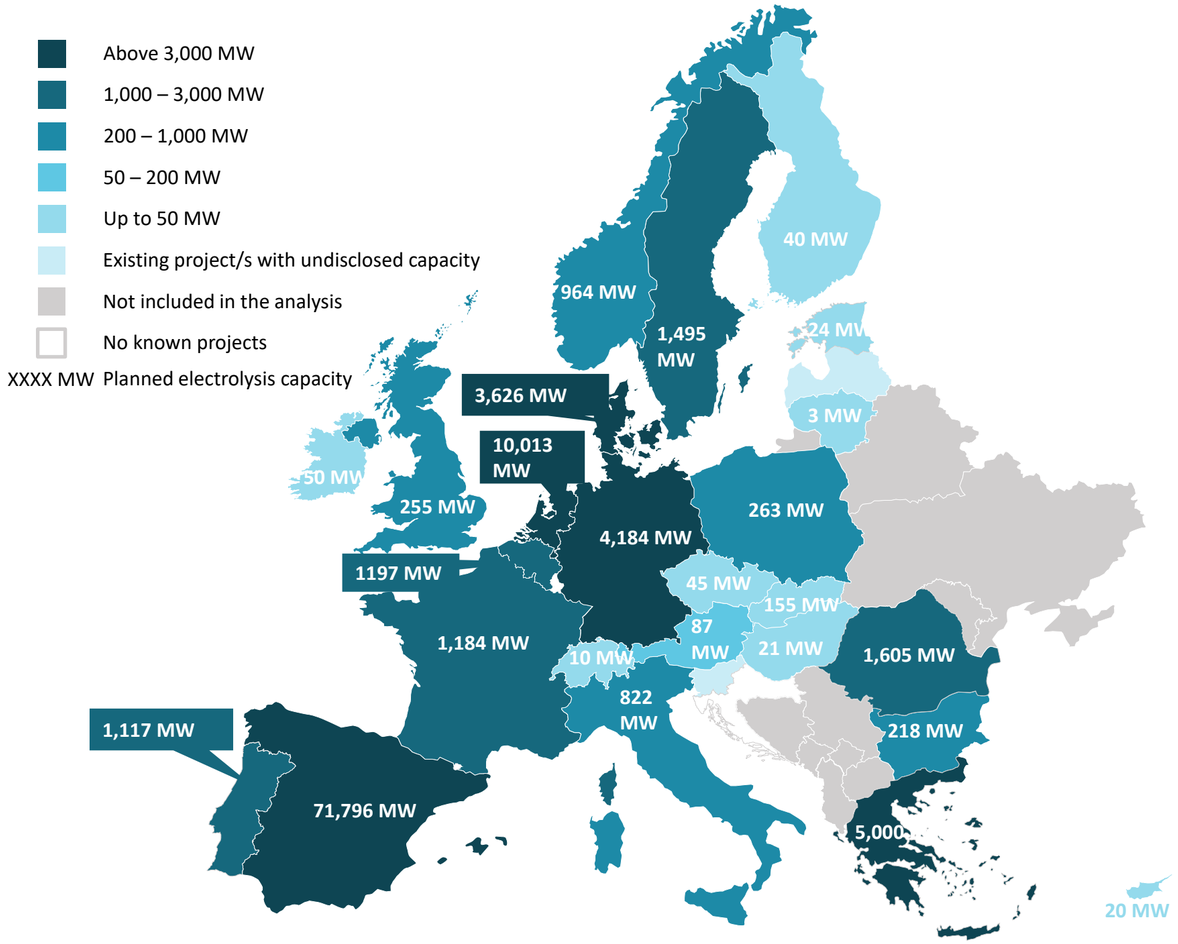


Hydrogen Europe

Renewable H2 production in ALL EU Countries

Planned electrolyzer capacity by 2030 (MW)

Data as of 10/06/2021



Comments

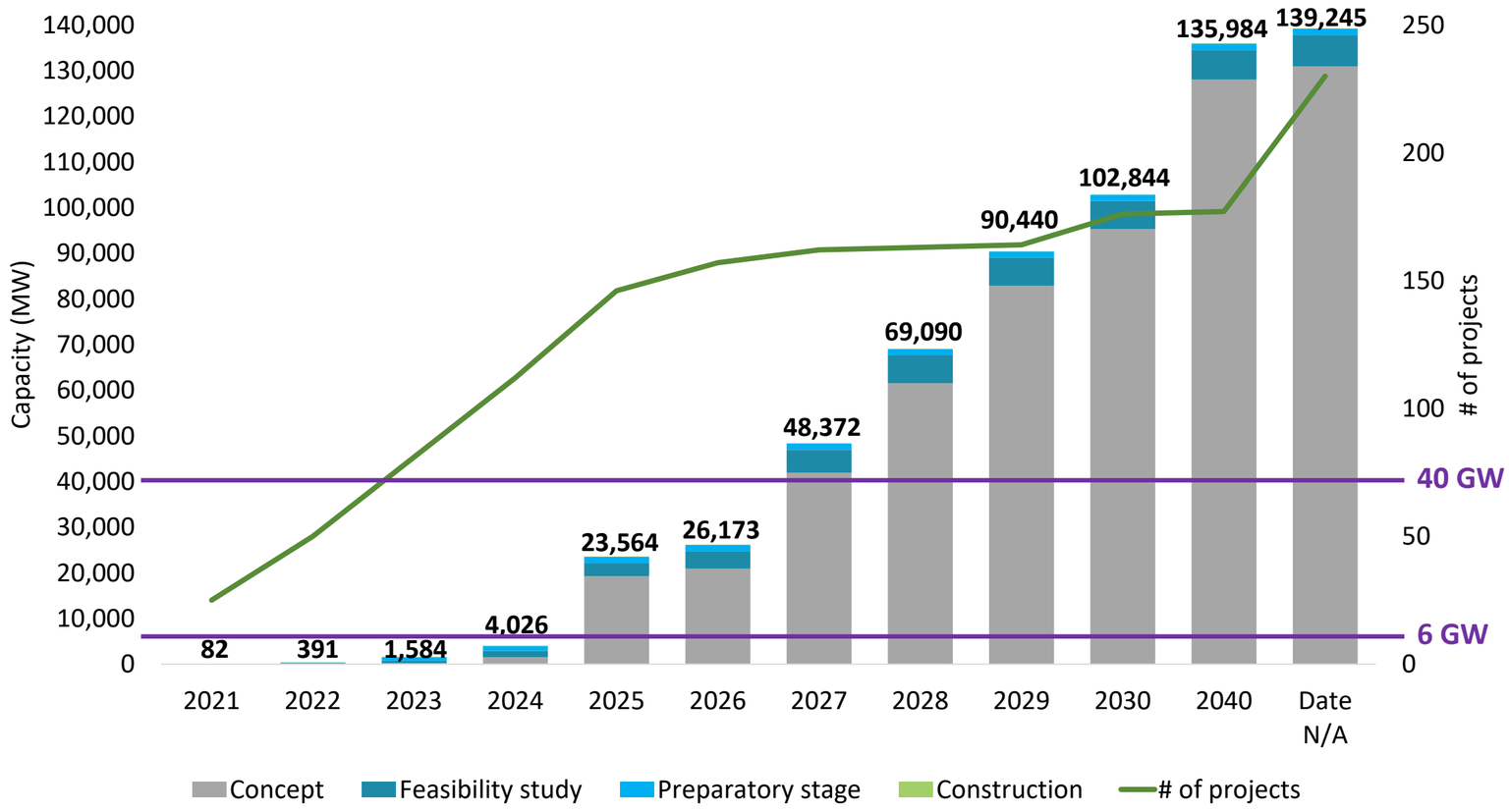
- Industry planning renewable H2 production in **ALL** EU Countries + UK
- **Large renewable H2 production capacity planned in:**
  - Spain (71 GW)
  - Netherlands (10GW)
  - Greece (5 GW)
  - Germany (4 GW)
  - Denmark (3.6 GW)
- **176 projects in EU 27** by 2030 announced

Notes: Displayed electrolyser capacities reflect projects that have an official starting date by 2030. There are numerous other projects with unknown starting dates that could be finished by 2030, but are not included in this analysis.
Source: Hydrogen Europe

Hydrogen Europe

However: Regulation does not help renewable H2 right now!

Cumulative planned PtH projects in EU by year 2021 - 2040 (MW and # of projects)

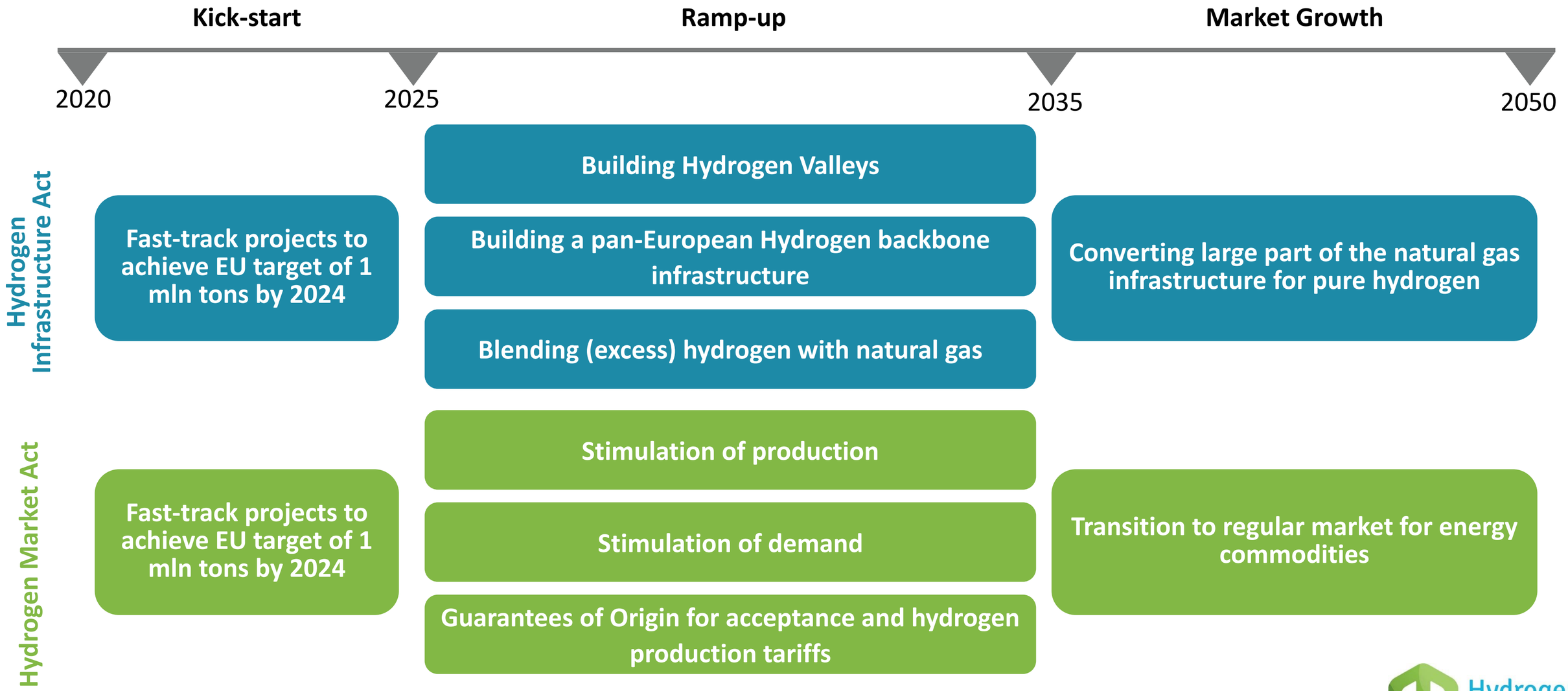


Solutions

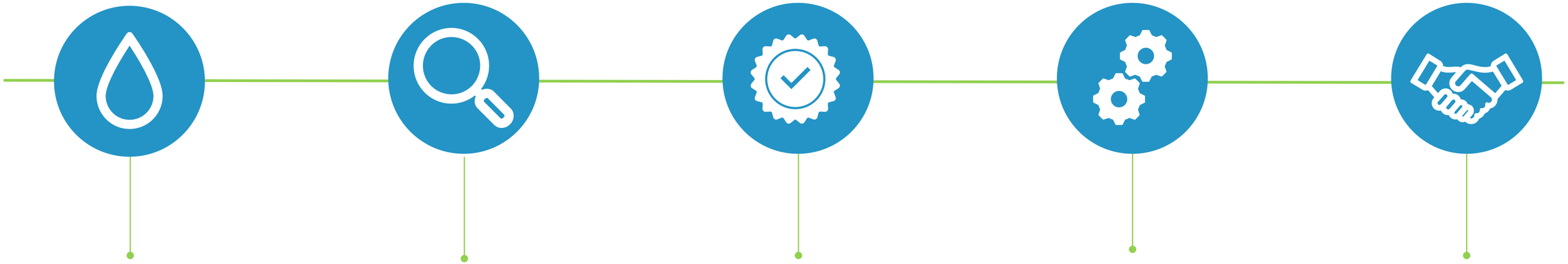
1. Dedicated legislation to govern hydrogen and hydrogen networks
2. Remove barriers to hydrogen investment
3. Create a level playing field with other net-zero technologies
4. Promote a harmonized approach to hydrogen

Hydrogen Europe

Harmonized approach to regulatory development via H2 Act



Gurantees of Origin: key to market clean hydrogen



Hydrogen as a distinct energy carrier, separate from electricity and gas.

GO must include *inter alia* (1) the primary energy sources and (2) the GHG footprint.

- 5 Ts – GOs must be
- Trackable,
- Traceable,
- Tradeable,
- Transparent and
- Trustworthy.

GOs need to capture the attributes resulting from different production pathways.

An international GO system is required for import and export of hydrogen.

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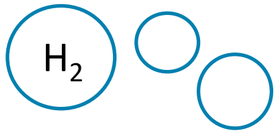
Global auctioning and levelising OPEX

EU

Global auctioning system to accelerate the ramp-up of clean hydrogen projects.

Incentive for SUPPLY



Supplier

Long-term purchase contracts are formed between supplier and consumer – reliable future.

Incentive for DEMAND

Consumer

Carbon Contracts for Difference

Bid		Carbon price		Public funds
70	−	40	=	30

Over the years, the bid price drops and carbon costs rise and such payments cease to exist.

Let’s don’t hamper Europe’s technology leadership

Herbert Diess @Herbert_Diess · May 18

Das Wasserstoff-Auto ist nachgewiesen NICHT die Klimalösung. Im Verkehr hat sich die Elektrifizierung durchgesetzt. Scheindebatten sind reine Zeitverschwendung. Bitte auf die Wissenschaft hören! @ArminLaschet @OlafScholz @andreasscheuer @ABaerbock

Forscher: Wasserstoffbasierter Pkw-Antrieb vorerst klimaschädlich

Eine Studie zeigt: Wasserstoffbasierte Kraftstoffe sind ineffizient und kostspielig. Die Wissenschaftler empfehlen E-Autos für eine ökologisch...

handelsblatt.com

Global Witness
@Global_Witness

🚨 Our new briefing out now shows @H2Europe - an influential #hydrogen lobby group - has been pressuring @EU_Commission to allow energy companies to use climate-wrecking fossil electricity to produce hydrogen, and label it green.

Greenwashed Hydrogen | Global Witness

Exposing corporate lobbyists' push to gut EU renewable energy rules

globalwitness.org

[Click here to read HE position paper on additionality]

Hydrogen Europe

Facilitating the deployment of renewable H2: Let‘s work together

Completely new theme

- Crosscutting
- Impacts many sectors
- Chicken and egg dilemma
- Saving and creating jobs

We urgently need

- Cooperation
- Fact based approach
- Ethical behaviour

Image: canva

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Europe should be first in deployment of renewable H2

Pictures: coe.int, https://www.gims.swiss/sites/default/files/news/H2-4.jpg

Hydrogen Europe

Thank you for your attention!

HYDROGEN EUROPE SECRETARIAT

Avenue de la Toison d’Or 56-60
BE-1060 Brussels

secretariat@hydrogeneurope.eu

+32 (0) 2 540 87 75

www.hydrogeneurope.eu