Welcome!

We will begin shortly...

Please mute your microphones

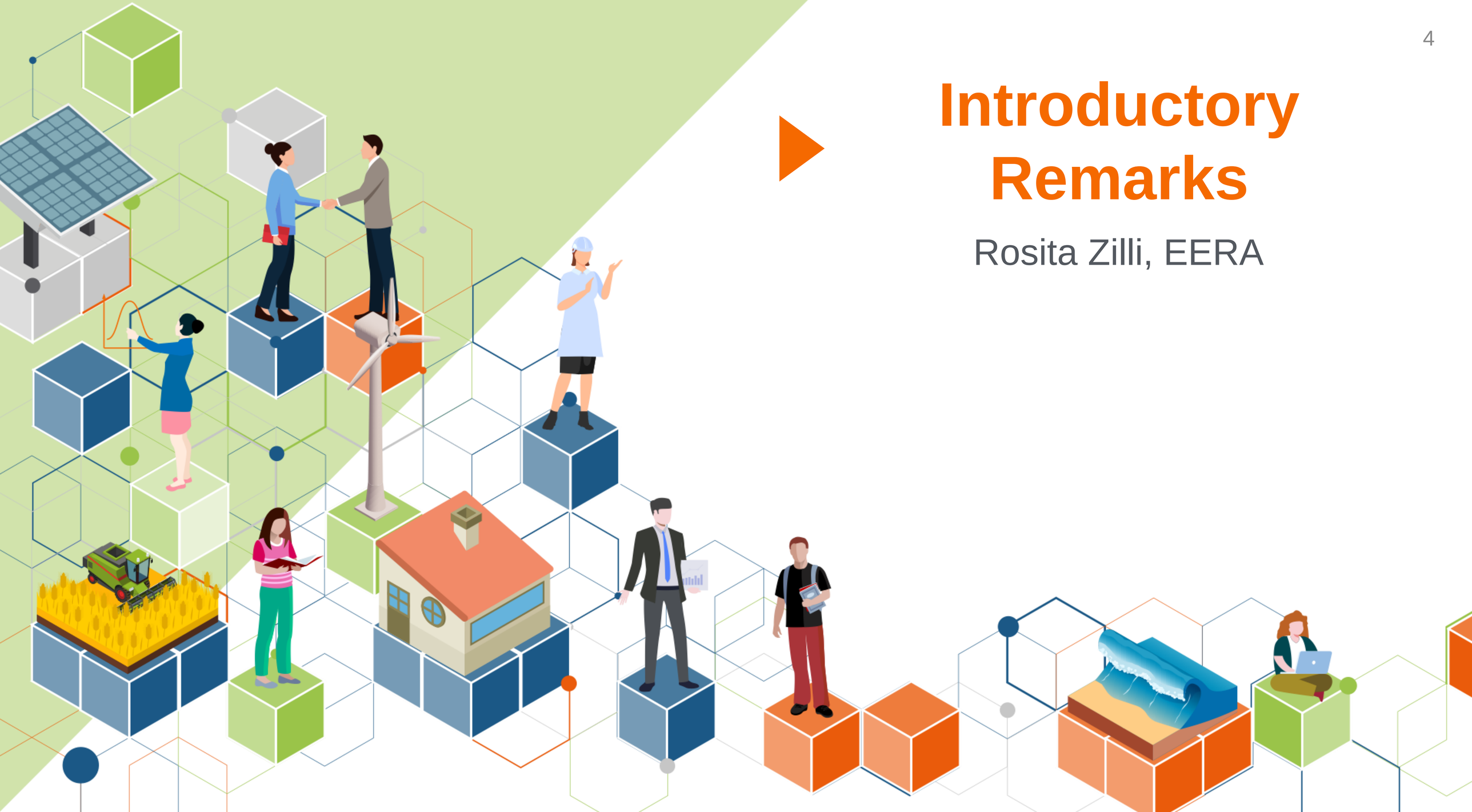
Write your questions in the Zoom Chat

Green Hydrogen & Clean Energy Research: Issues at Stake, Ways Forward

Challenges & Opportunities for Clean Energy Research

Agenda

Time	Session	Speaker
10:00	Introductory Remarks	***Rosita Zilli*** - EERA, Senior Policy Officer
10:05	Panel Discussion	Moderator: ***Adel El Gammal*** - EERA, Secretary General
	• European Commission	***Luca Polizzi,*** Policy Officer, DG Research and Innovation, Hydrogen Research and Innovation Policy and Funding at Clean Energy Transition Unit
	• European Economic and Social Committee	***Pierre-Jean Coulon,*** former President of the Transport, Energy, Infrastructure and the Information Society (TEN) section and Rapporteur of the EESC Opinion on the Hydrogen Strategy
	• EERA	***Stephen McPhail,*** Representative and former co-ordinator, EERA Joint program Fuels Cells and Hydrogen
	• Hydrogen4EU project	***Gunhild Reigstad,*** Senior Scientist at SINTEF
11:05	Q&A Session	
11:25	Summary & Operational Conclusions	***Ivan Matejak*** – *EERA, SUPEERA Project Coordinator*



Introductory Remarks

Rosita Zilli, EERA

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What is your background?

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What do you expect to primarily take out from this webinar?

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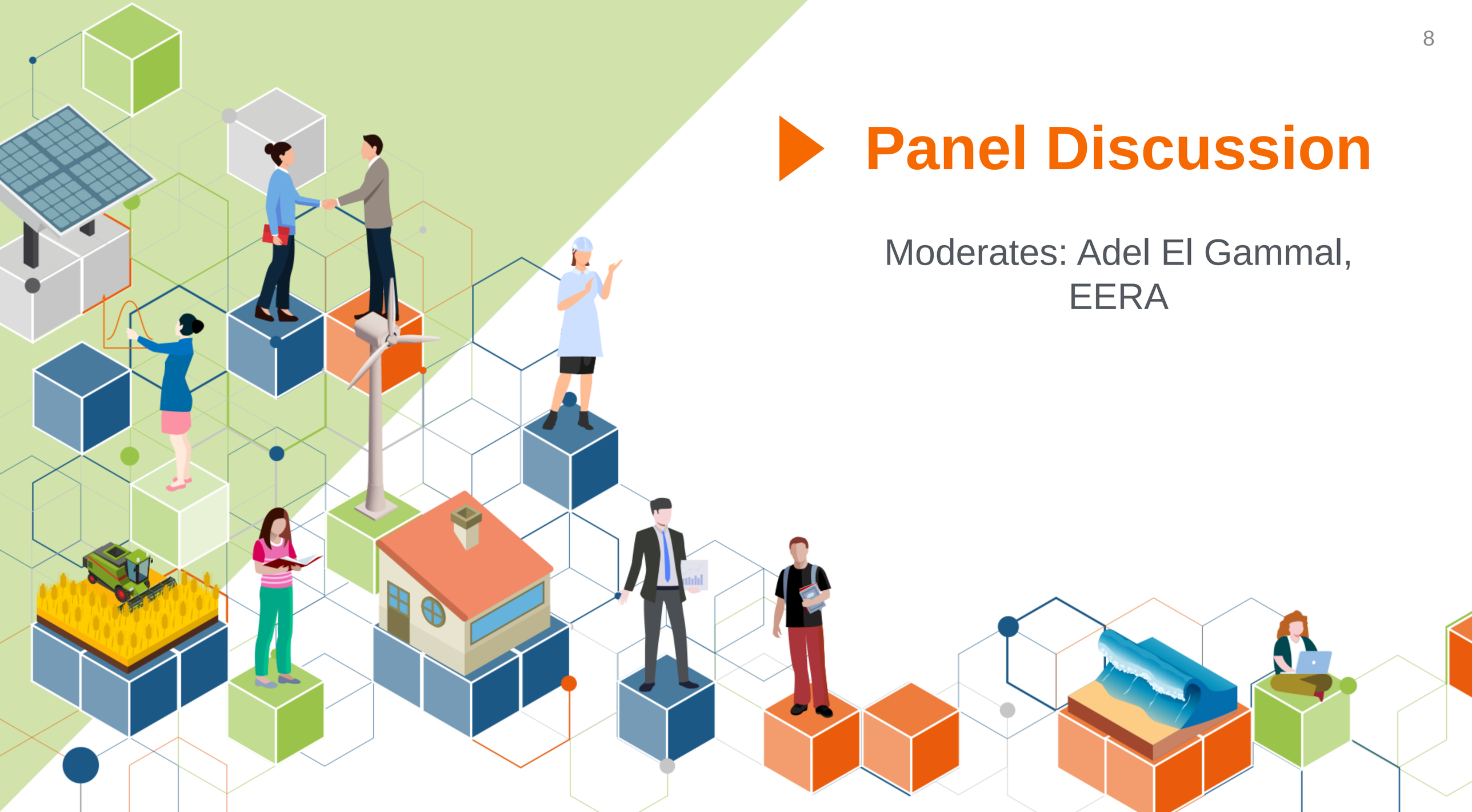

Panel Discussion

Moderates: Adel El Gammal, EERA

Support to the coordination of national research and innovation programmes in areas of activity of the European Energy Research Alliance

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 949125.

Luca Polizzi

Hydrogen Research and Innovation Policy and Funding at Clean Energy Transition Unit

European Commission, DG RTD

“Green Hydrogen & Clean Energy Research: Issues at Stake, Ways Forward"

SUPEERA webinar

Brussels

20 May 2022, 10:00 to 11:30 CEST, online

Luca Polizzi
DG Research & Innovation
Clean Planet – Directorate
Policy Officer R&I on Hydrogen
Clean Energy Transition Unit

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Question 1

Is hydrogen a truly green solution?

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Question 2

What are the viable alternatives to hydrogen?

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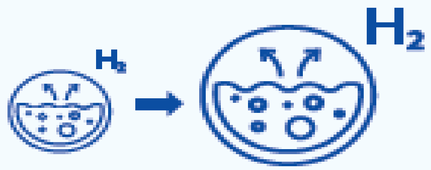
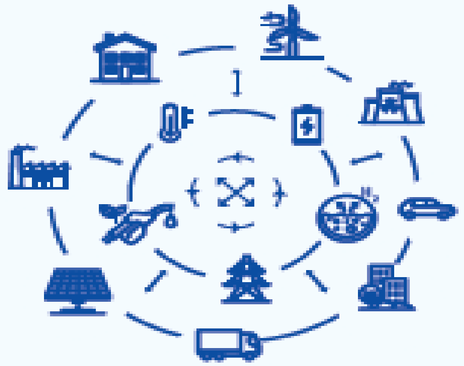
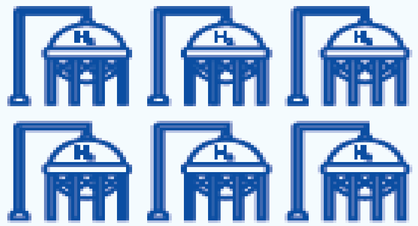
An ambitious strategy for Europe

The path towards a European hydrogen eco-system step by step :







Today - 2024

From now to 2024, we will support the **installation of at least 6GW of renewable hydrogen electrolysers in the EU**, and the production of **up to 1 million tonnes** of renewable hydrogen.

2025 - 2030

From 2025 to 2030, hydrogen needs to **become an intrinsic part of our integrated energy system**, with at least 40GW of renewable hydrogen electrolysers and the production of **up to 10 million tonnes** of renewable hydrogen in the EU.

2030 -

From 2030 onwards, **renewable hydrogen will be deployed at a large scale** across all hard-to-decarbonise sectors.

European Commission

R&I support to hydrogen policy

- *Horizon Europe:*
  - *Public / private partnerships: CH JU, transport and industry partnerships*
  - *Public / public partnership: Clean Energy Transition co fund*
  - *Cluster 5 and 4*
  - *EIC*
  - *EIT KIC InnoEnergy*
- H2020: Green Deal call
- SET Plan revamping
  - Mission Innovation – Mission on clean hydrogen

European Commission

SWD proposed domains of action

- An ERA for uptake to market: Open Innovation Testbeds
- An Era of data: the EU Clean Hydrogen Observatory
- An ERA for skills: the new project under ERASMUS +
- Hydrogen valleys
- Reinforced connection with international frame

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Question 3

How can private investors be incentivised to put their money into the technology?

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Question 4

How will hydrogen infrastructure be financed?

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REPOWEREU TO CUT OUR DEPENDENCE ON RUSSIAN GAS

More rooftop solar panels, heat pumps and energy savings to reduce our dependence on fossil fuels, making our homes and buildings more energy efficient.

Decarbonising Industry by accelerating the switch to electrification and renewable hydrogen and enhancing our low-carbon manufacturing capabilities.

Speeding up renewables permitting to minimise the time for roll-out of renewable projects and grid infrastructure improvements.

2030

Doubling the EU ambition for biomethane to produce 35 bcm per year by 2030, in particular from agricultural waste and residues.

Diversifing gas supplies and working with international partners to move away from Russian gas, and investing in the necessary infrastructure.

A Hydrogen Accelerator to develop infrastructure, storage facilities and ports, and replace demand for Russian gas with additional 10 mt of imported renewable hydrogen from diverse sources and additional 5 mt of domestic renewable hydrogen.

European Commission

Hydrogen Transition

- Three main ingredients are needed for the transition to a hydrogen economy:
  1. strong public investments across the entire H2 value chain
  2. international cooperation for the global market
  3. partnership with the private sector
- Short-term and long-term solutions needed & hydrogen already contributing to the transformation of EU economy -important tool of the Green Deal
- Hydrogen Valleys perfect example of the hydrogen economy Europe wants
- Europe ambition to become a frontrunner in the global market for H2
- Scaling up hydrogen production, storage, distribution and end-users applications in Europe

Hydrogen valleys: Key points

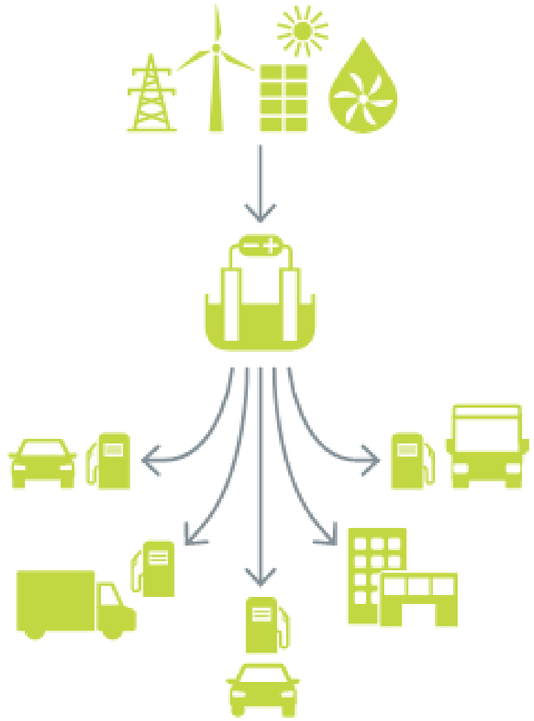
- Different H2Vs archetypes to be considered (avoid “one size fit all” approach) – all size and scales are possible depending on the nature of the area/scope/needs
- Integrated approach across the entire value chain from R&I to deployment – for H2 RE production to final use
- Could cover industrial nodes but much more: transport nodes with other applications, mixed uses (housing, industry, transport, etc..) – full flexibility as long as it covers more than one single domain of application and more than one part of the value chain
- Rolling out the hydrogen valley concept (from small scale to large scale) will put pressure on the production capacity of electrolysers

Hydrogen Valleys Archetypes (2)

K: Hydrogen Valley archetypes

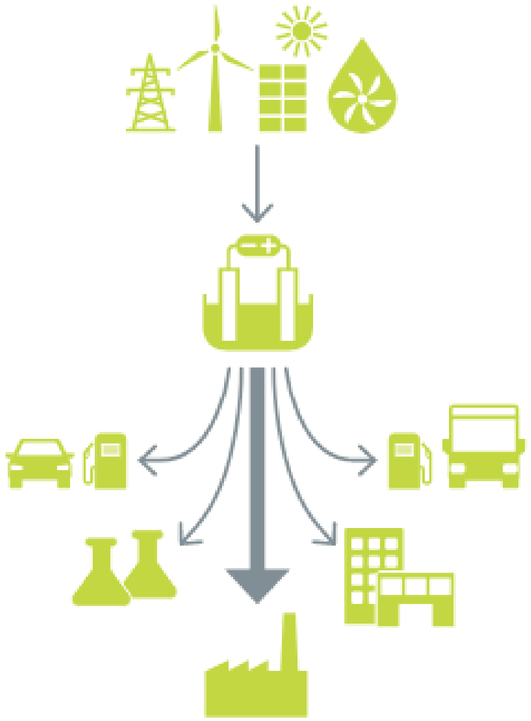
Archetype 1:

Local, small-scale & mobility-focused



Archetype 2:

Local, medium-scale & industry-focused



Archetype 3:

Larger-scale, international and export-focused

Clean Hydrogen Partnership

Hydrogen Valleys in Europe www.h2v.eu

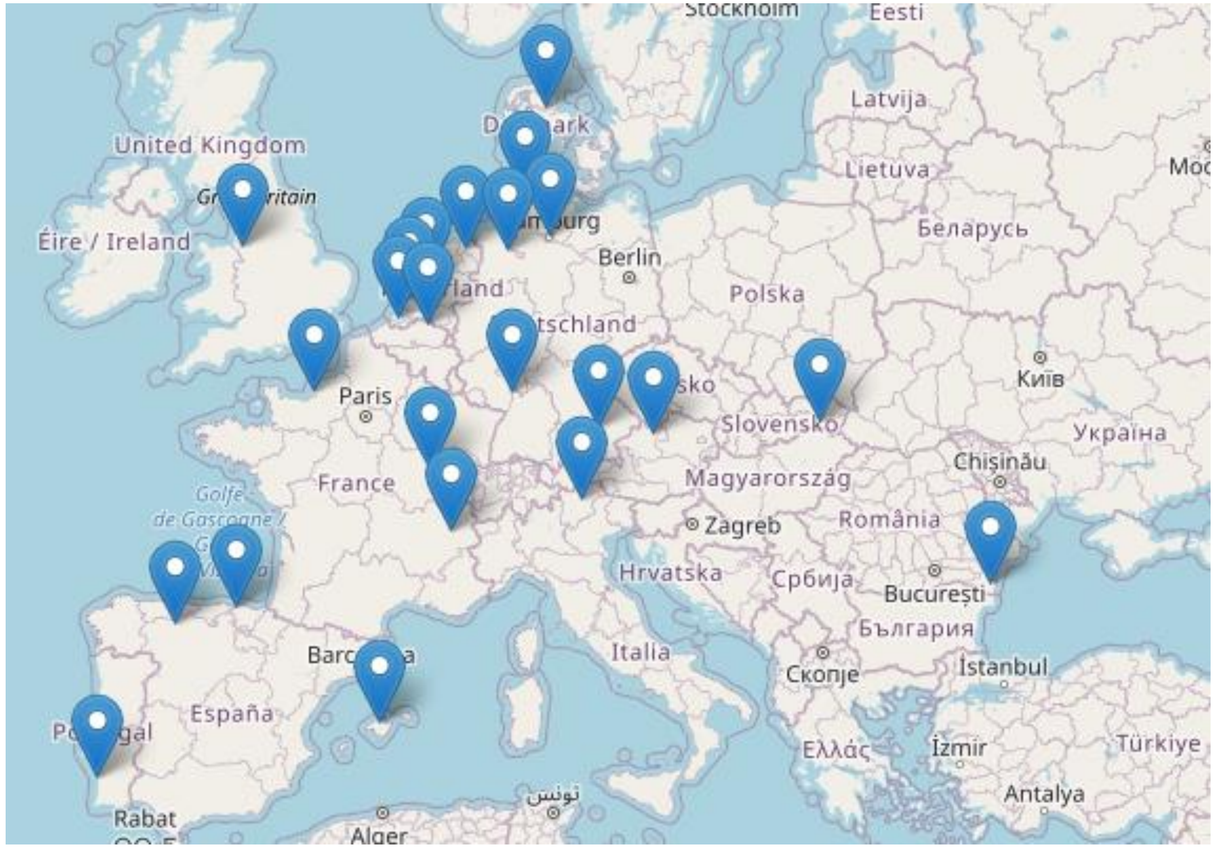
23 Hydrogen valley's identified in 10 EU countries + U.K.

3 in The Netherlands:
- North Netherland
- Zuid Holland
- Zeeland (H2 delta)

2 in U.K.:
- North West England
- Orkney Islands

4 in France:
- Rhone Alpes
- Normandy
- Bourgogne Franche Comté
- French Guiana

1 in Portugal:
Sines industrial hub



1 in Denmark:
Hobro (Hybalance)

5 in Germany:
- Munich (Hybayern)
- Mannheim (H2rivers)
- Heide (eFarm)
- Hamburg (NDRL)
- Oldenburg (HyWays)

1 in Slovakia:
Kosice (Black Horse)

1 in Romania:
Constanza (Blue Danube)

3 in Spain:
- Island Mallorca
- Basque (BH2C)
- Green Crane

1 in Italy:
Bolzano

1 in Austria:
Linz (WIVA)

European Commission
Co-funded by the European Union

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Question 5

How do you think hydrogen valleys can contribute to REPowerEU?

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THANK YOU!

Contact points:

luca.polizzi@ec.europa.eu

SUPEERA

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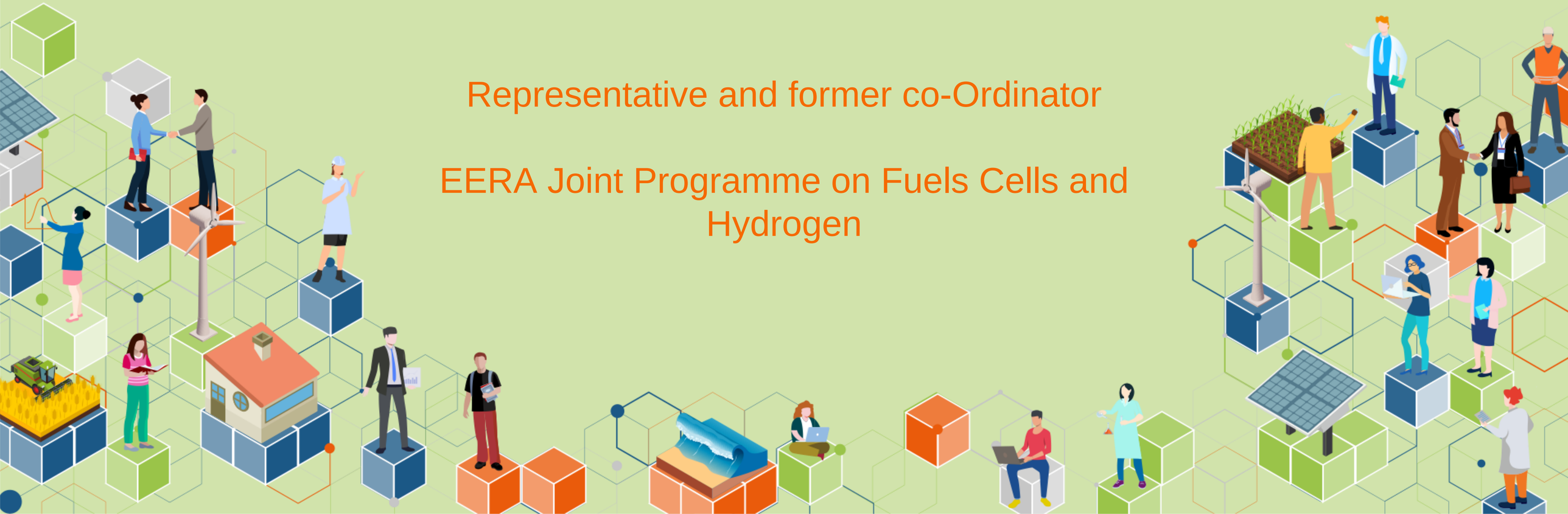
Stephen McPhail

Representative and former co-Ordinator

EERA Joint Programme on Fuels Cells and Hydrogen



The EERA Joint Programme Fuel Cells and Hydrogen

Stephen McPhail (KIWA)

Ex-JP FCH Coordinator

SUPEERA Webinar – 20 May 2022

EERA
European Energy Research Alliance

JP FCH – in a nutshell

- 40 Members from 17 countries
- Universities and RTOs: profiles and competence sheets on line
- 7 Sub-Programmes:
  - SP1 Electrolytes
  - SP2 Electrodes & Catalysts
  - SP3 Stacks
  - SP4 Systems
  - SP5 Modelling & Validation
  - SP6 Alternative H2 production
  - SP7 H2 Handling & Storage

https://www.eera-fch.eu

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Electrochemistry

Design & integration

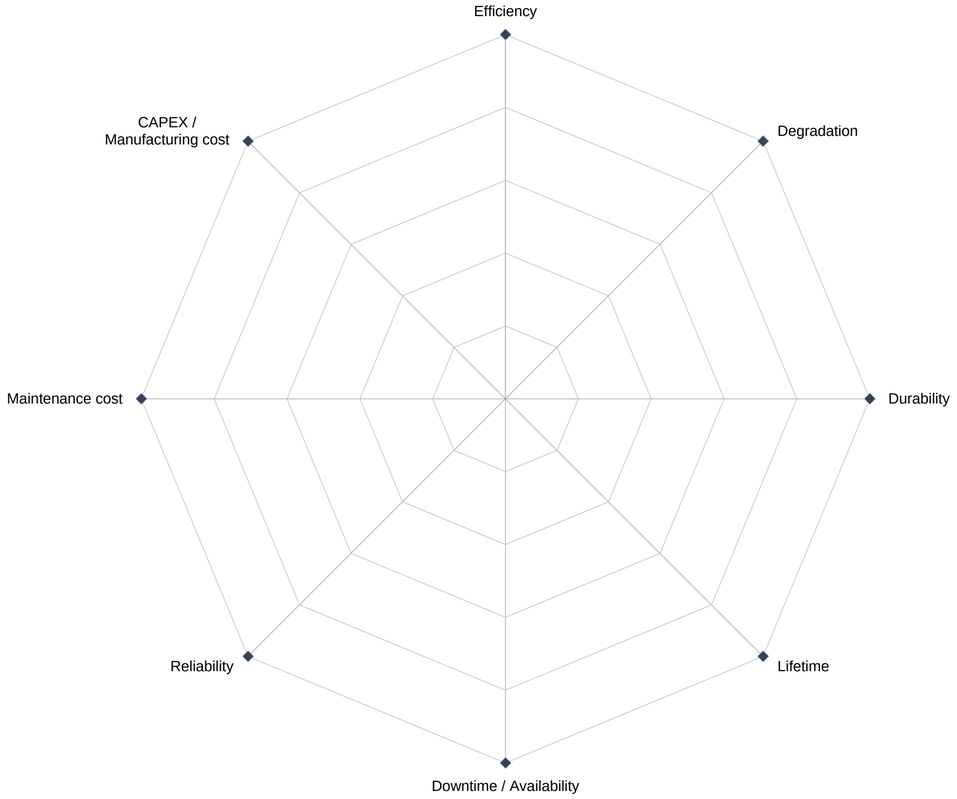
Alternative pathways

Commodity mgt

1	Electrolytes	HT Membranes, electrolytes, degradation mechanisms, accelerated testing methods
2	Catalysts & Electrodes	New cat/elect., deposition techniques, membrane assembling, low Pt load
3	Stack materials and Design	Interconnect, bipolar plates, contacting and gas diffusion layers, New sealing materials, novel design
4	Systems	New materials/coatings corrosion resistant, fuel processing and fuel upgrade/clean up, heat management, power conditioning
5	Modelling, Validation and Diagnosis	Cell, stack, system levels:. Models on: kinetic, thermal and water management, non isothermal operations, degradation mechanisms, simulation tools, predictive models for performance and life time, dynamic, control strategies
6	Alternative Hydrogen Production	Thermo chemical; Biochemical; Algae; Photo catalysis; Thermolysis, C&S gap analysis and pre normative research concerning H2 safety
7	Hydrogen Handling & Storage	Compressed and Liquid Hydrogen Storage, Hydrogen carriers, Hydrogen Storage Systems

EERA European Energy Research Alliance

How Research and Technology Organizations drive FCH development



Reference document on KPIs for FCH research

2020-2030

Published 18 September 2020

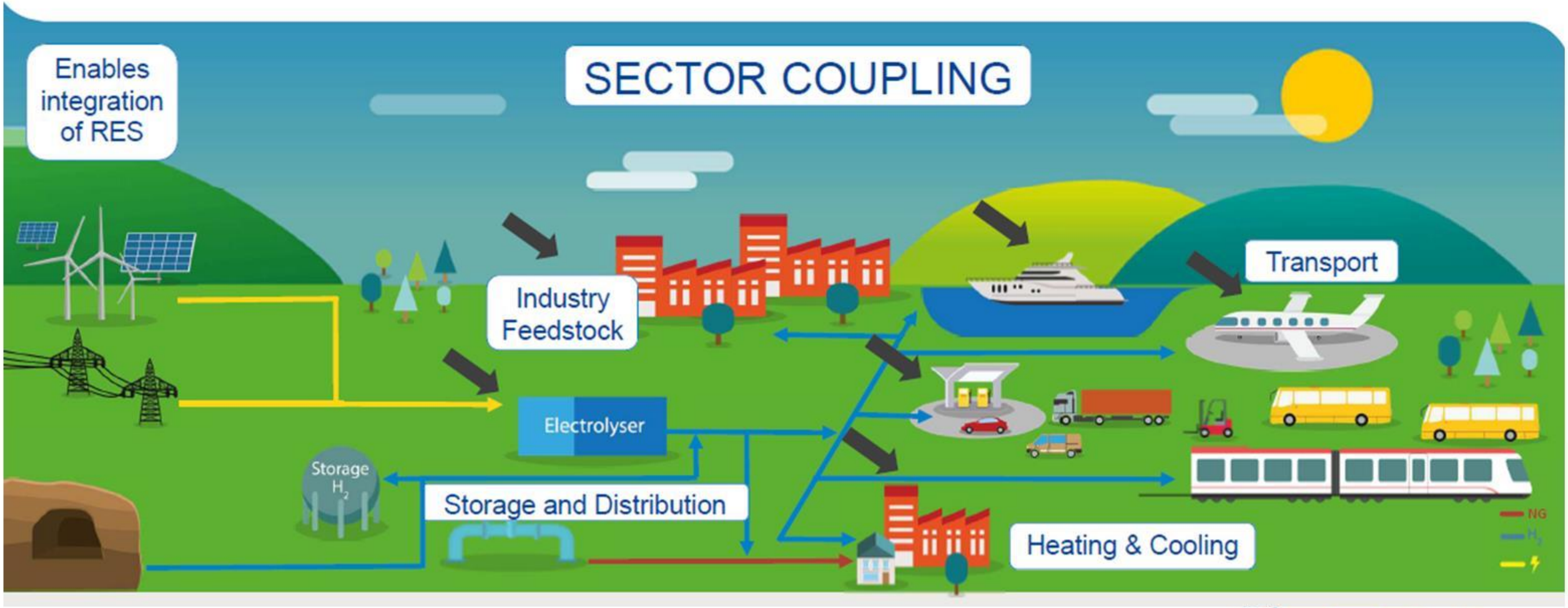
https://www.eera-fch.eu

- **EERA JP FCH** and **Hydrogen Europe Research** collaborate on
  - Setting targets for research
  - Defining Key performance indicators for research
  - Stimulating systematic progress in research

- **EERA internal Workshops** with:
  - JP Bioenergy
  - JP Energy Storage
  - JP CCS
  - JP Nuclear Materials
  - JP Wind

- **JP FCH projects:**
  - **BALANCE** on technology for sector coupling

What it's about: a hydrogen-based economy



EERA European Energy Research Alliance

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Where do you see the main bottleneck for the achievement of the EU Hydrogen strategic targets?

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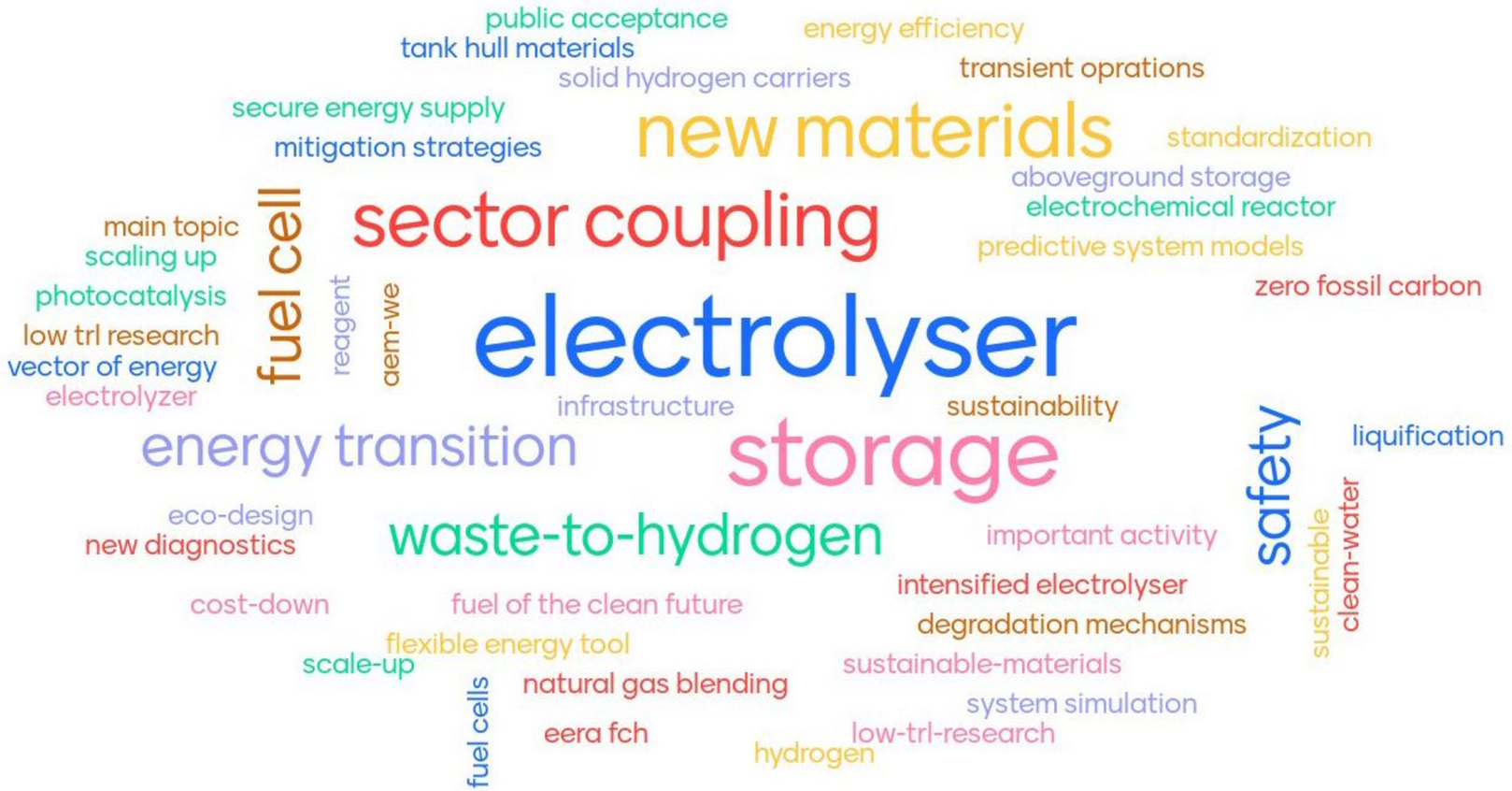
JP FCH – going ahead

The Challenge:

To preserve research freedom while maintaining scientific acumen and upholding unbiased investigation into the role of hydrogen in our society



2022 and beyond

- **Ambition to continue as an independent group of scientists, fostering interaction with other JPs, providing ad-hoc contributions to research strategies and work programmes**

EERA European Energy Research Alliance

stephen.mcphail@kiwa.com

https://www.eera-fch.eu

EERA
European Energy Research Alliance

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Gunhild Reigstad

Senior Research Scientist

SINTEF

Q&A Session

Conclusions

Ivan Matejak, EERA


SUPEERA


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DTU


KIT
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VTT