

Hydrogen Research & Innovation Days
24-25 November 2025



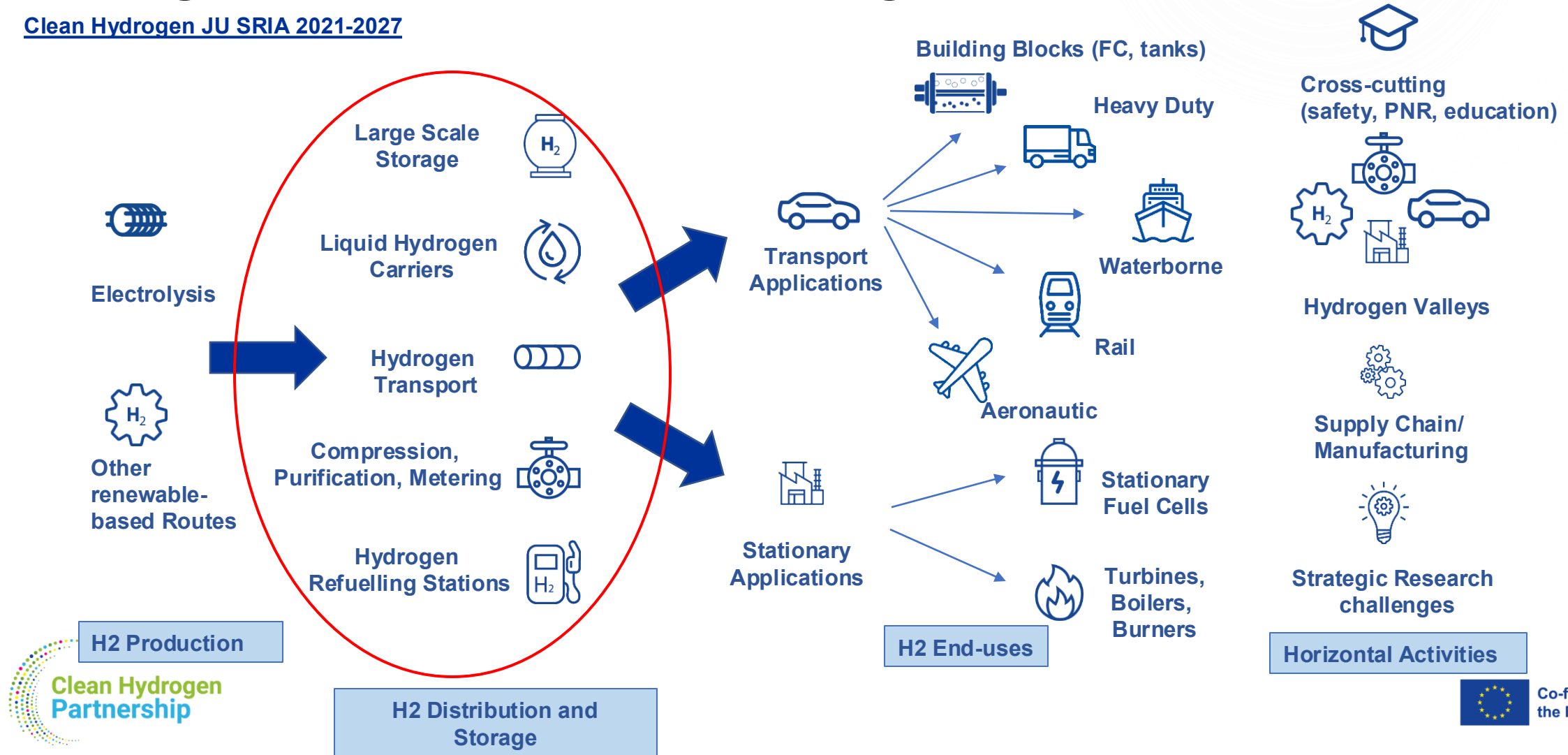
INNOVATIONS IN HYDROGEN INFRASTRUCTURE

Dionisis Tsimis – Project Officer, Clean Hydrogen Partnership



Strategic Research & Innovation Agenda

Clean Hydrogen JU SRIA 2021-2027

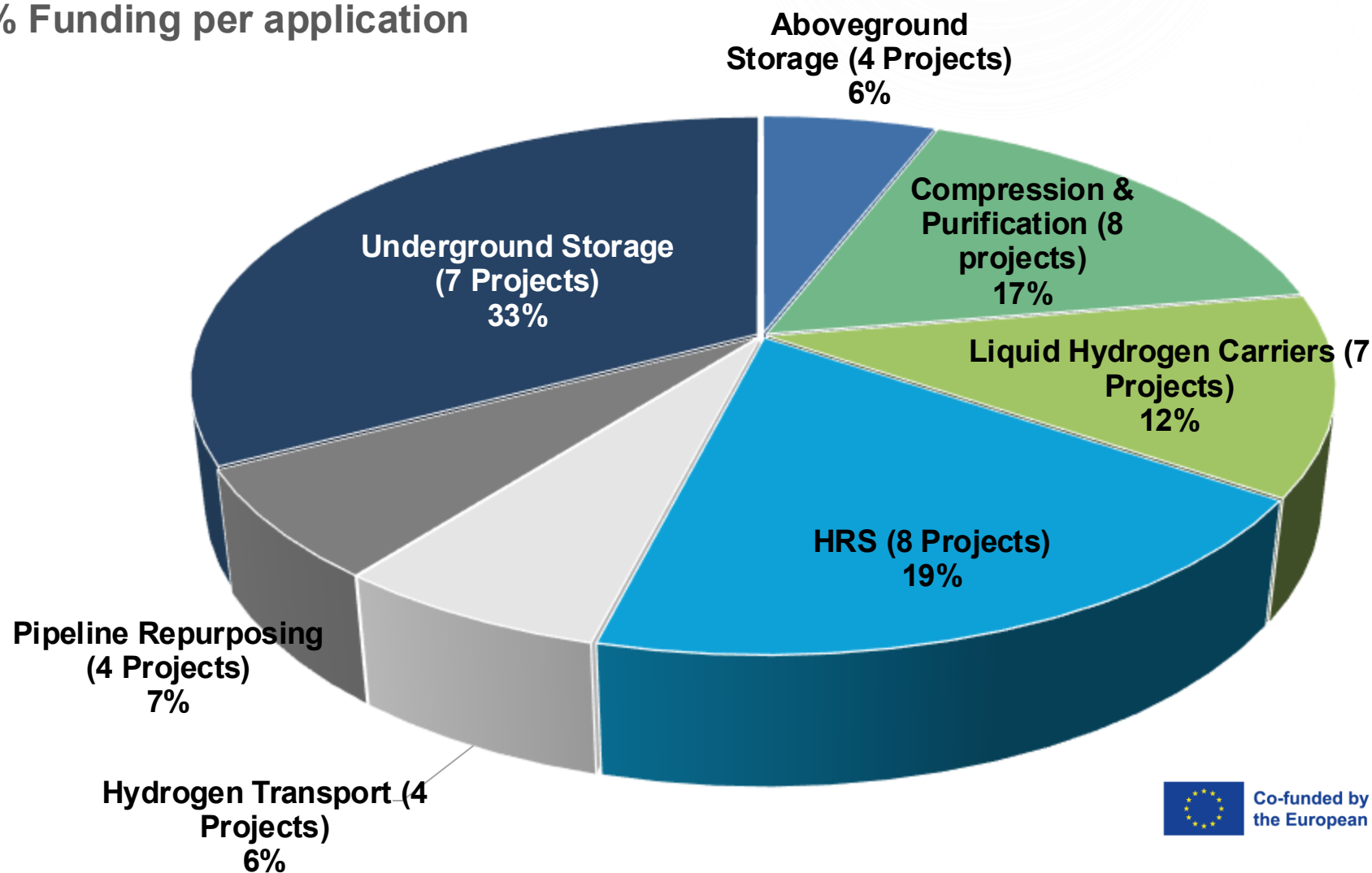


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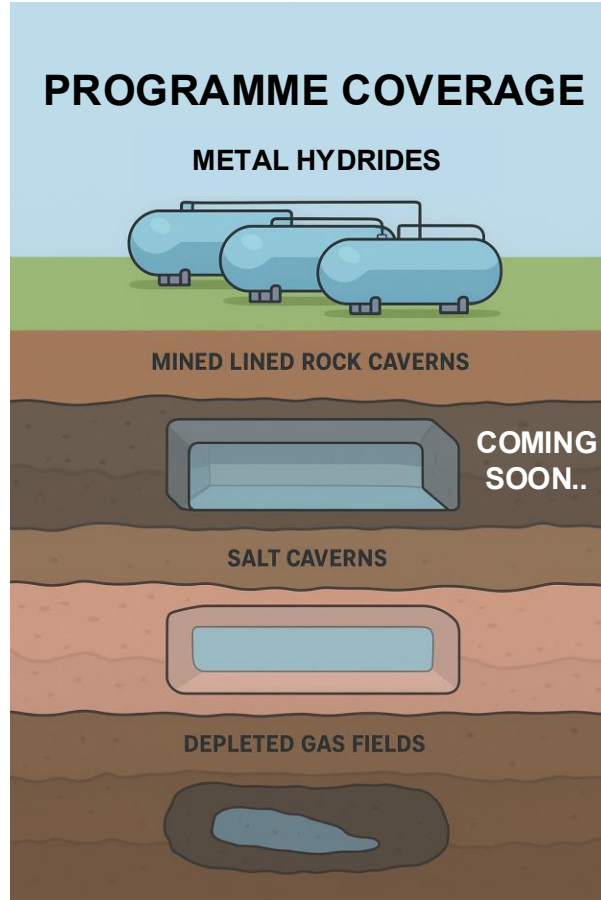
% Funding per application



700
€/kgH₂

Specific CAPEX €/kgH₂

10
€/kgH₂



hyster
Hydrogen Storage

Salt Cavern Demonstrator
4.5 Years duration
5M€ of funding



- 3 tonnes of Hydrogen stored in a salt cavern
- 100 pressure cycles performed 110-150 bar
- Replication Roadmap 4 key regions



- Specific Capex 16-29€/kgH₂
- Repurposing a Natural Gas site can offer a CAPEX reduction of 25%



Devil is in the details



Hy^{DRA}



NG Salt Caverns → 50 years to reach 244TWh
[Estimates for H₂ storage demand by 2050 → 300 TWh](#)
 So far [9.1TWh](#) has been announced by 2030

FrHyGe
Underground
Hydrogen
Storage

FLAGSHIP PROJECTS



- 100 tons cycled between 2 caverns
- 2 Replicators FR + DE = 20,000 tons
- 4 seasonal cycles in Austria
- 4 Replicators HU, NL, AT, ES = 26,000 tons

COMPRESSORS



COSM^{HYC} DEMO
INNOVATIVE H₂ COMPRESSION



Compressor installed in HRS ☒
60 kg/h ☒
1 year testing

HIGH-FLOW REFUELLING COMPONENTS

Adapting to heavy-duty
requirements



Validate protocols to refuel 100kg in 10':
- Manufactured components
- Testing started



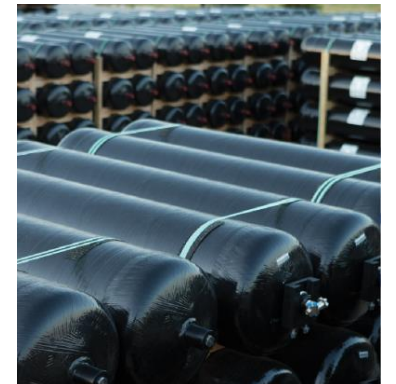
Tank storage
test system
99kgH₂ ☒

LOGISTICS

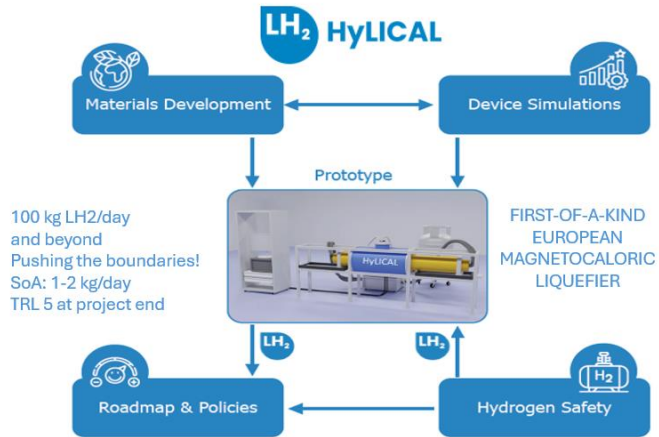


Tube Trailers

Type V 700 bar ☒
1,500kg



LIQUEFACTION



Targets 8 kWh/kg and cost of <1.5 €/kg @100kg/day

STORAGE



Novel Insulation Concept for both stationary and on-board storage



Next gen tank for shipping of LH₂
To be demonstrated in 180m³
Scalable design to 200,000m³

REFUELLING



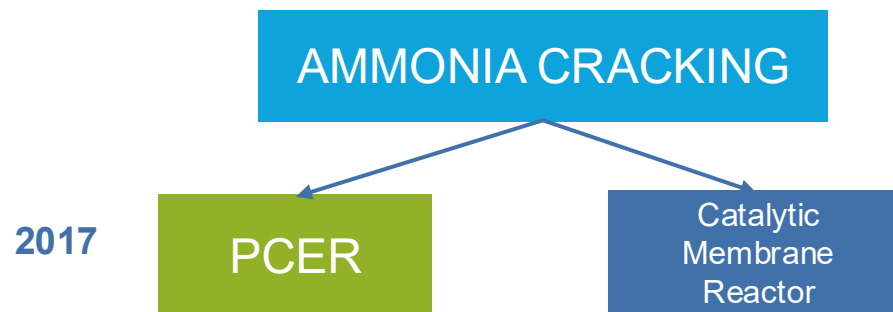
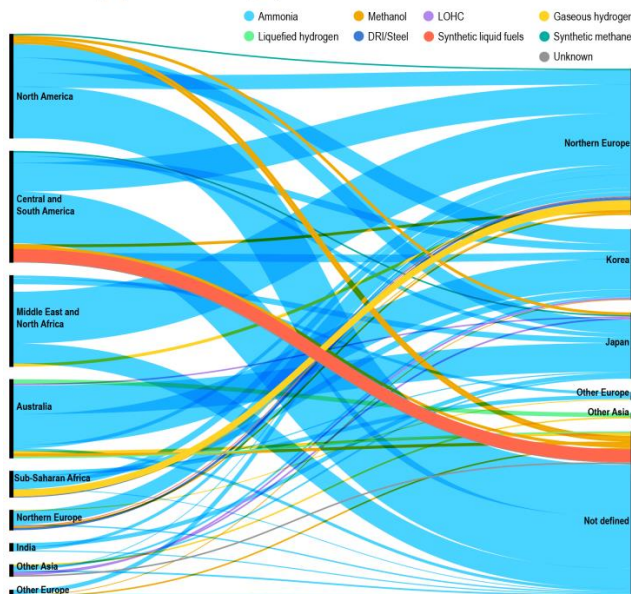
High-flow liquid hydrogen delivery



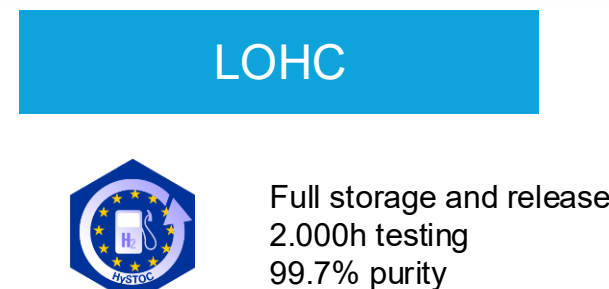
5 tons per hour
Zero boil-off

IEA Global Hydrogen Review 2025

Figure 4.2 Bilateral trade flows of low-emissions hydrogen by carrier, excluding projects at earlier stages, 2030



Two generations low CRM catalysts



Low Pt catalyst development



10x reduction of Pt compared to SoA



10kgH₂/day prototype

Hydrogen carrier delivery cost (for 3000km ship transfer) **2.5€/kgH₂**

Hydrogen carrier specific energy consumption **17 kWh/kgH₂**





Thank you for your attention!