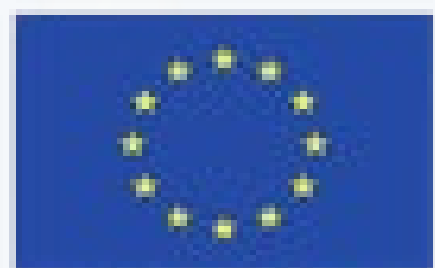


Workshop

Green Ammonia Energy:

Intensified production, conversion and separation



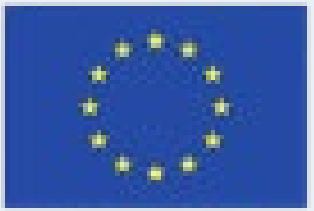
Funded by
the European Union



Workshop

Green Ammonia Energy:

Intensified production, conversion and separation



Funded by
the European Union



Prof. Fausto
Gallucci

Prof. Jimmy A.
Faria Albanese

Dr. Konstantinos
Kourtzanidis

Dr. Valentina Cechetto

Dr. Jaione Olló

Dr. Angela Thomas

Moderator

FASTER

CAIPIR|NH₃A

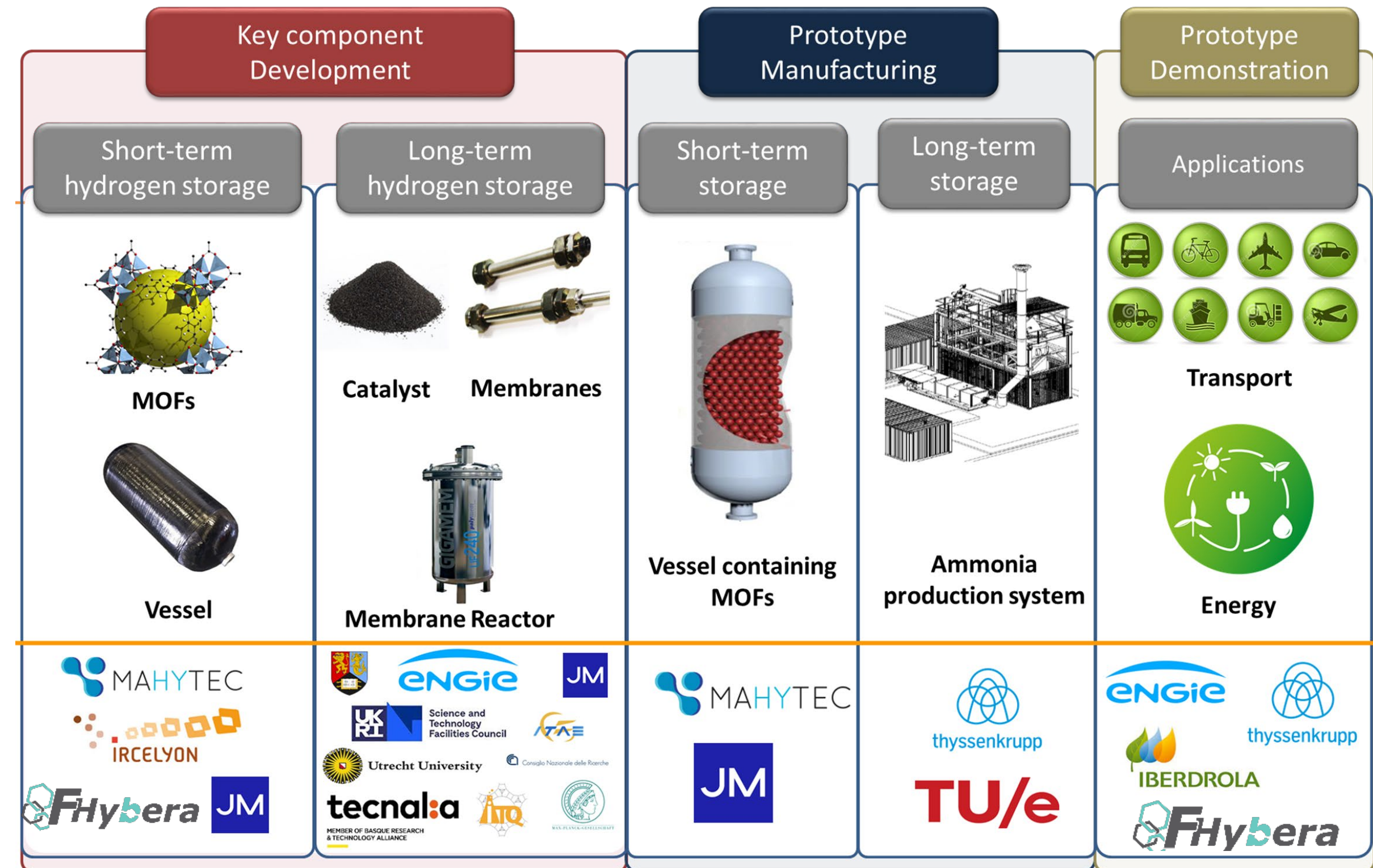
MEASURED

AndreaH

AMBER₂
APOLO



- AMBHER project aims to provide quantum leap in the development of **hydrogen storage technologies**
 - ✓ **Short-term storage** – Metal Organic Frameworks (MOFs)
 - ✓ **Long-term storage** – Ammonia synthesis using a Catalytic Membrane Reactor
- Sets the basis for commercialization of greener technological pathways
- Develop a full LCA, LCC and Health and Safety Analysis (HSE)
- Pave the way for future exploitation of Key Exploitable Results (KERs).
- Promote dissemination and communication of results and expand its impact





Funded by the European Union



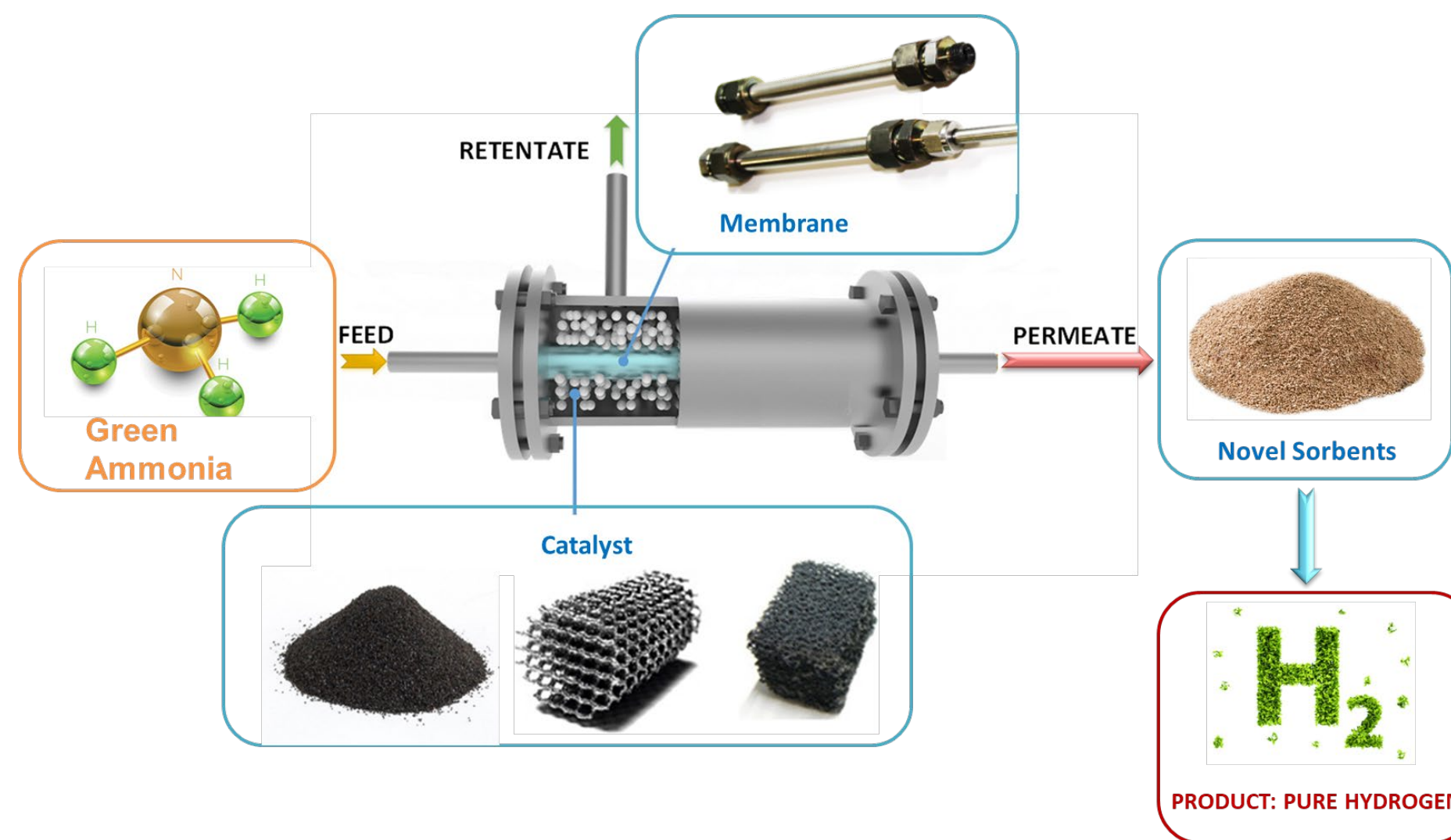
Ammonia based membrane reactor for green Hydrogen production



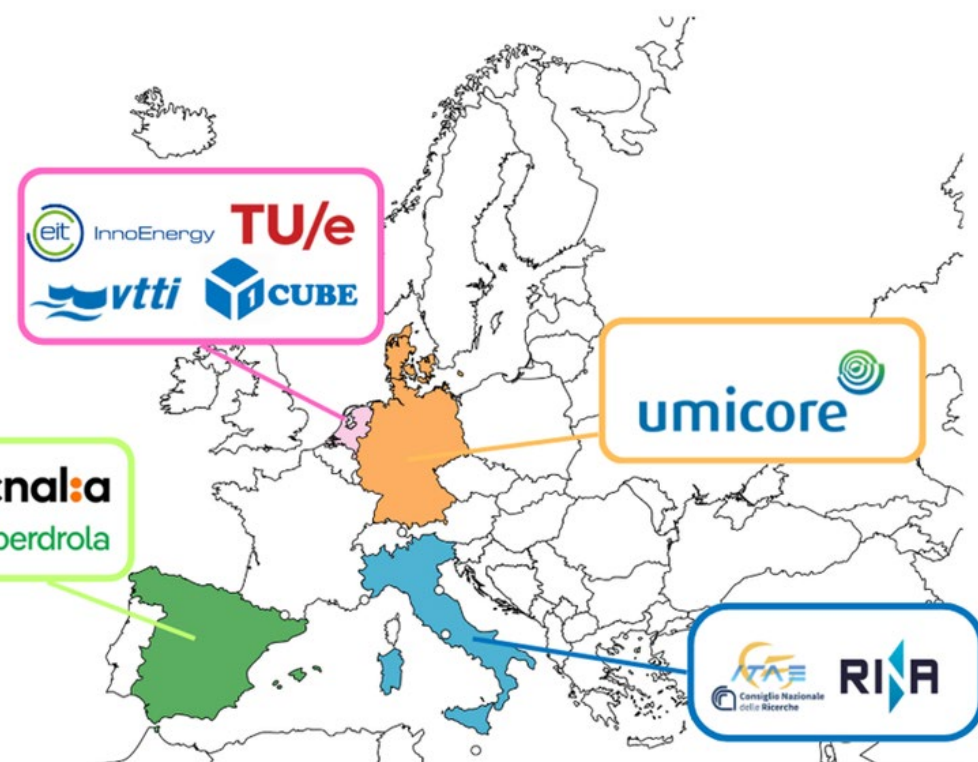
The **ANDREAH** project aims at providing a quantum leap in the development of advanced ammonia decomposition technologies to produce ultra-pure hydrogen (>99.998%) by developing an innovative system based on a **Catalytic Membrane Reactor (CMR)** for the cracking of Ammonia.

SPECIFIC TARGETS

- Intensified ammonia cracking system based on **Catalytic membrane Reactor Technology**:
 - Structured (POCS) Catalyst without or with low Ru content (<1wt%).
 - Membranes for selective H₂ separation.
 - Novel sorbents for H₂ polishing.
- LCA, LCC and H&S analysis of the project.
- Business case
- Dissemination and communication



(Disclosure or reproduction without prior permission of ANDREAH is prohibited).



Start date: 1st July 2023
Duration: 48 months
Estimated Cost: 2,980,361.25 €

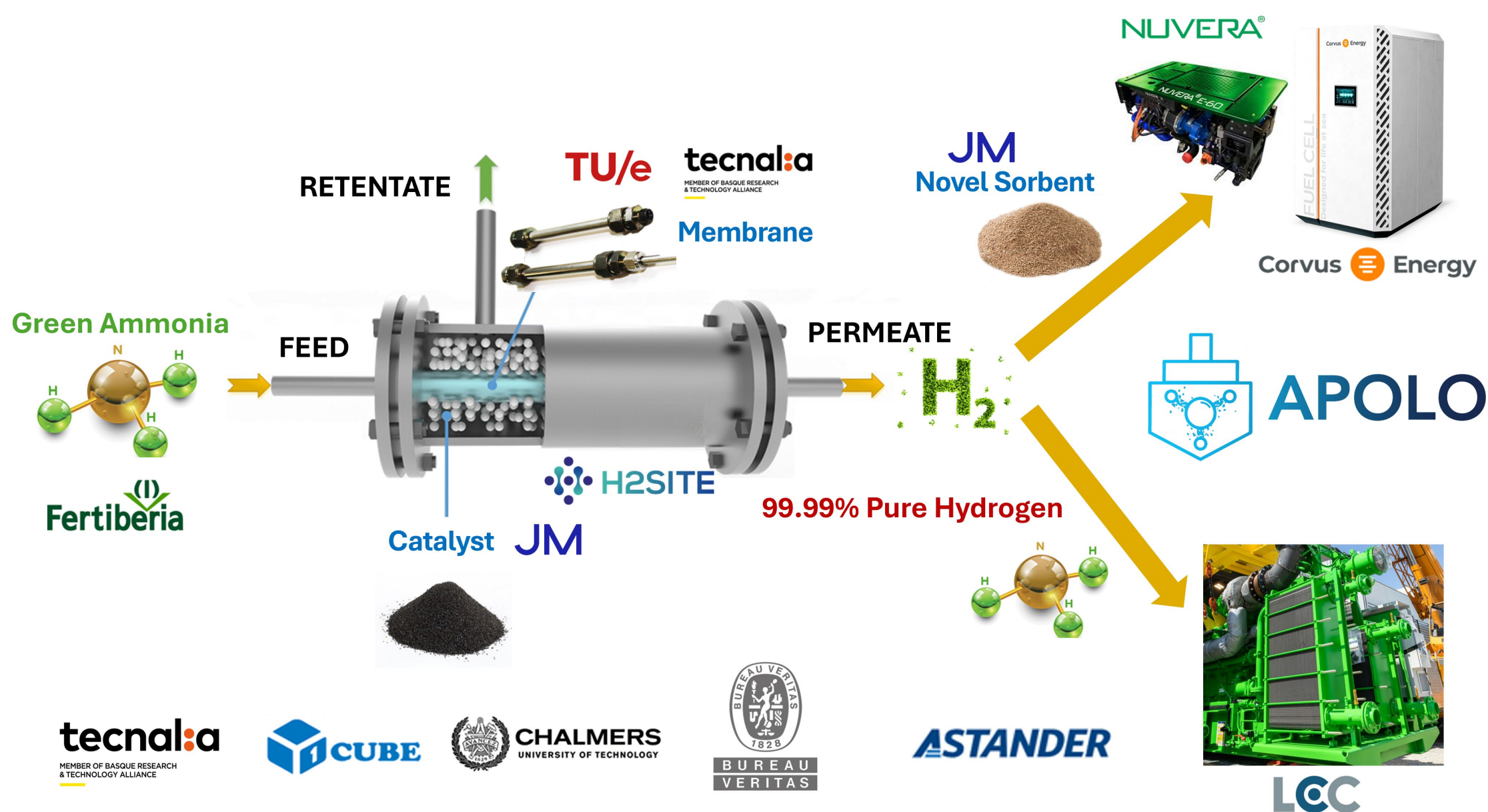
“The project is supported by the Clean Hydrogen Partnership and its members Hydrogen Europe and Hydrogen Europe Research.”

“Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or Clean Hydrogen Joint Undertaking. Neither the European Union nor the granting authority can be held responsible for them.”

Targets the full decarbonisation of the maritime sector focusing on power conversion!

Smart combination of onboard Ammonia cracking technology, a Catalytic Membrane Reactor (CMR) with

1. An advanced Fuel cell running on pure hydrogen (**Prototype 1/ KER1**)
2. A novel Ammonia Engine running on an ammonia/hydrogen blend (**Prototype 2/ KER2**)



Develop a full LCA, LCC, sLCA and Health and Safety Analysis (HSE) of APOLO.

Propose Safety Regulations for Onboard Ammonia use as a fuel

Pave the way for future exploitation of APOLO Key Exploitable results.

Promote the dissemination and communication of APOLO's results and expand its impact.

Concept

Developing an advanced L-NH₃ combustor: the Plasma Mist Ammonia Burner

Methodology

- Detailed plasma-combustion kinetics
- Advanced multi-physics simulations
- Unique L-NH₃ injection systems
- Tailored plasma tech for reduced emissions & enhanced efficiency
- Smart combustion control strategies
- Extensive TRL 4 testing

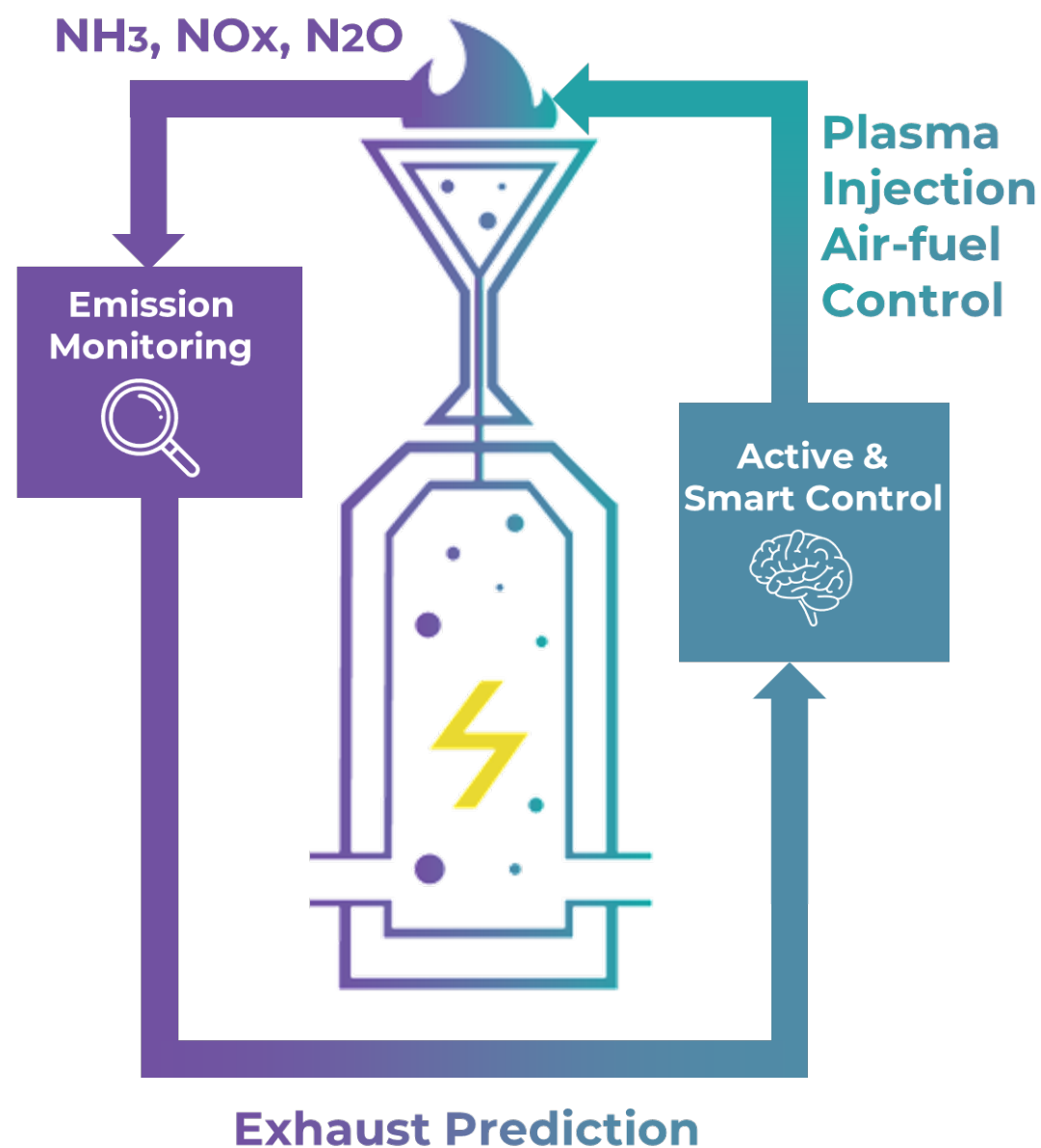


Holistic Approach to ensure environmental, social, economic sustainability:

- LCA, LCC, sLCA
- Market research & uptake strategies

Benefits

- Direct L-NH₃ combustion with ultralow emissions
- High thermal efficiency / enhanced ignition quality
- Carbon-free combustion with reduced fuel storage needs



Sectors of Interest



Power Generation



Maritime



Aviation



Automotive

Coordinator: Dr. Konstantinos Kourtzanidis
kourtzanidis@certh.gr



FASTER



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N. 101192091

Flexible ammonia synthesis technology for energy storage

Coordinator: Prof. Jimmy Faria Albanese j.a.fariaalbanese@utwente.nl



Flexible ammonia synthesis technology for energy storage

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MEMBRANE SCALE UP FOR CHEMICAL INDUSTRIES



€ 7.971.409

BUDGET



48

MONTHS



17

PARTNERS



9

COUNTRIES

MEASURED advances membrane technologies (PV, MD, GS) for key industrial processes, delivering TRL7 demonstration under real conditions, supported by multiscale modelling, LCA, and a strong focus on societal acceptance and market readiness.

MEASURED brings together 17 partners (SMEs, industry, and academia) to develop advanced materials, reactor designs, and processes, identifying the most sustainable solutions from techno-economic and environmental perspectives.



*Visit the
MEASURED
website to learn
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14/04/2026

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