BUILDING THE EU HYDROGEN NETWORK

A PROPOSAL TO IMPLEMENT THE AFIR NETWORK

Confidential – For discussion only – January 2023
**Hy24 – Financing H2 Scale-Up**

Hy24 recently closed a fund to invest €1bn in hydrogen mobility.

**September 2020**

AI, TE & Vinci launched the Clean H₂ Infra Fund to accelerate decarbonisation at global scale.

**May 2021**

Ardian & FiveT Hydrogen join force in a JV (Hy24) and apply.

**February-March 2022**

Clean H₂ Infra Fund announces the signing of 3 first investments.

**January 2021**

They launched a call for tender to select a management company for the fund.

**July 2021**

Hy24 selected as management company.

**Investors (non-exhaustive)**

- Air Liquide
- Total Energies
- Vinci
- Plug
- Chart
- Baker Hughes
- Enagas
- GRT Gaz
- Snam
- JBIC
- Lotte Chemical
- Allianz
- Groupama
- BBVA
- Nuveen
- Société Générale
- CMA CGM
- DBJ
- RFP
- CDPQ
- MEMORES

The Fund closed its fundraising at €2.0 billion commitments with 50% to be invested in hydrogen and hydrogen derivatives production and 50% in mobility.
INVESTMENTS ALONG THE VALUE CHAIN

Three first record investments in green hydrogen

1. **HY2GEN**
   - **Sector:** Green hydrogen and hydrogen-based derivatives production
   - **Country:** North America & Europe
   - **Type:** Greenfield
   - **Stake:** Minority
   - **Management:** Experienced management with a proven track record
   - **Shareholders:** Include one major Offtaker and leading Tier 1 EPC supplier to support
   - **Project diversity:** Diversified short-term pipeline in attractive geographies
   - **Power supply:** Advantageous electricity supply (cost/load) on major projects, leveraging local power sources
   - **Pipe maturity:** Maturity of first projects & relevant size [100 to 250 MW capacity]
   - **Major offtakers**

2. **enagas renovable**
   - **Sector:** Green hydrogen + Renewables & Biomethane
   - **Country:** Mainly Spain
   - **Type:** Greenfield
   - **Stake:** Minority
   - **Co-shareholder:** Creation of a dedicated Joint Venture with a national incumbent
   - **Pipe maturity:** Aggregate 700 MW identified pipeline
   - **Integrated projects:** Synergies and downside protection from combination of renewables + green hydrogen and early cash flows from biomethane
   - **Public support:** Strong public support at both Spanish and EU level

3. **H2MOBILITY**
   - **Sector:** Mobility - Fueling infrastructure network
   - **Country:** Germany
   - **Type:** Brownfield - expansion
   - **Stake:** Minority
   - **Management:** Experienced management with a proven track record
   - **Existing network:** Already operates 90 stations, objective is to develop 300 stations by 2030
   - **Offtakers:** Projects will be developed hand in hand with offtakers, public authorities, and fleet operators
   - **Solid existing shareholders:** Major OEMs and energy players in the shareholding base

Information provided for illustrative purposes only without any binding contractual force.
Hydrogen fuel is required as part of a holistic solution to the decarbonisation of the European road transport system:

- **Provides long ranges and fast refuelling** which is required for heaviest use vehicles (trucks, delivery, 24hr operation, first responder)

- **Ensures diversity of drivetrain options** (alongside the battery electric option) as we attempt a rapid decarbonisation of the sector

- **Avoids some of the key battery-only risks:** availability of scarce materials, challenges with grid capacity

- **Europe has a lead** and can ensure a globally competitive industrial system across the hydrogen mobility supply chain

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**Hydrogen Truck** (from Volvo), is one of a number being developed by large manufacturers such as Daimler, IVECO, Scania & SME players such as Quantron and Hyzon. All plan 1,000’s to 10,000’s per year by mid 2020’s

**Hydrogen Van** (from Opel/STellantis), will compete with vehicles soon to be manufactured by Renault. Both plan to begin series production before 2025

**Hydrogen Bus** (from Solaris), is one of a number of successful European models, including CaetanoBus, EvoBus, Van Hool and Wrightbus. Over 200 on the road, with orders of many 100’s in place

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**THE KEY CHALLENGE:** RAPIDLY ESTABLISHING A REFUELLING NETWORK WITH ENOUGH COVERAGE AND CAPACITY
SITUATION TODAY
A perfect momentum confronted to uncertainty

All actors are ready and willing to move forward, but are waiting for a clear institutional framework

- 150 km of maximum distance between H2 stations
- 450 km of maximum distance between liquid H2 stations
- 2 t/day of minimal capacity
- Minimum 1 station per TEN-T urban node
- Care + comprehensive networks
- 2030 target

- 200 km of maximum distance between H2 stations
- No maximum distance between liquid H2 stations
- No minimal capacity
- Stations' location to be determined
- Re-assessment in 2025
- Core network only!
- 2030 target

- 100 km of maximum distance between H2 stations
- 400 km of maximum distance between liquid H2 stations
- 2 t/day of minimal capacity
- Minimum 1 station per TEN-T urban node
- Care + comprehensive networks
- 2027 target
At least 1000 HRS by 2030?
The AFIR deployment will only materialize if key challenges are overcome

The Commission’s proposal on AFIR

c. 1000 stations

Risk of current organic approach

- Underutilisation of the HRS network
- High CAPEX and OPEX costs
- Isolated projects and initiatives
- Small-scale HRS capacity
- Delayed roll-out of the network

THE AMBITION IS THERE BUT SEVERAL CHALLENGES MUST BE ADDRESSED IN THE VERY SHORT TERM TO ENSURE RAPID, SIGNIFICANT AND Viable DEPLOYMENTS
KEY CONTACTS
A dedicated team to answer your question