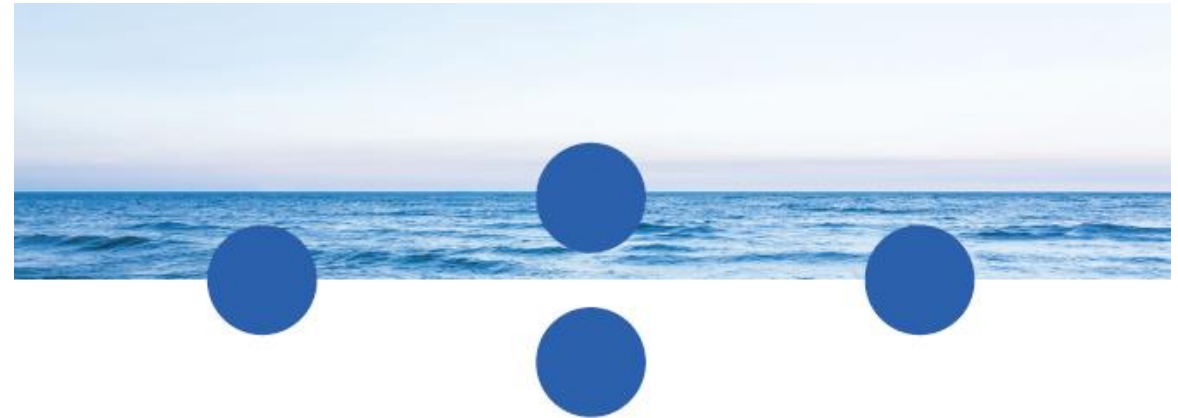


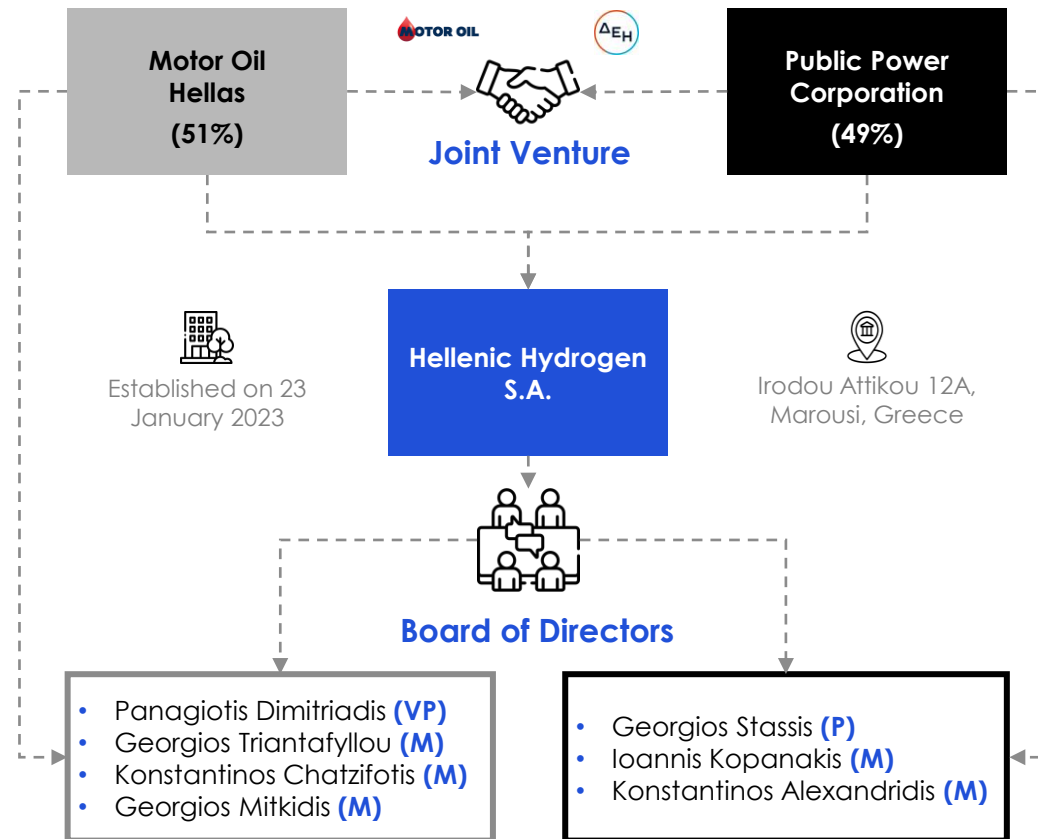


# Renewable Hydrogen: From hype to reality



Hellenic • •  
Hydrogen

# Hellenic Hydrogen company structure & vision



Hellenic Hydrogen is envisaging to shape the Greek renewable H<sub>2</sub> market through the development and operation of H<sub>2</sub> electrolysis units in Greece, using entirely Renewable Energy Sources

- Construction of large-scale electrolysis plants
- Production, storage, marketing & sale of renewable H<sub>2</sub> in Greece & abroad

# Introduction of the **North-1 Project Amyntaio**



Decommissioned lignite area with **significant industrial history**



**Expandability (up to 400 MW)**

**RES abundance**

**Proximity to Natural Gas grid DESFA & TAP**

**Existing electric grid & water utilities**

**Skilled workforce**

**Existing facilities for re-use**

# North-1 Project has strong off taking potential...



## CCGTs & new CHP unit

- CCGT plants totaling to 2,4 GW with up to 50% H<sub>2</sub> combustion ability
- Kardia Power Station (up to 20% H<sub>2</sub> combustion capability)

- **Motor Oil Hellas & PPC** are Shareholders in 2 out of 3 CCGT plants
- **PPC** owns Kardia Power Station

### Future looking opportunities



## Hydrogen Valley

- Hydrogen Valley in W. Macedonia

- To be coordinated by **Hellenic Hydrogen**



## Transportation

- Heavy trucks in W. Macedonia



## Export Capability

- Export to the West via the Trans Adriatic Pipeline (TAP)
- Export to the North via Greece-North Macedonia Gas Interconnector being developed by DESFA & NER



## Chemical Plants & Cement Industry

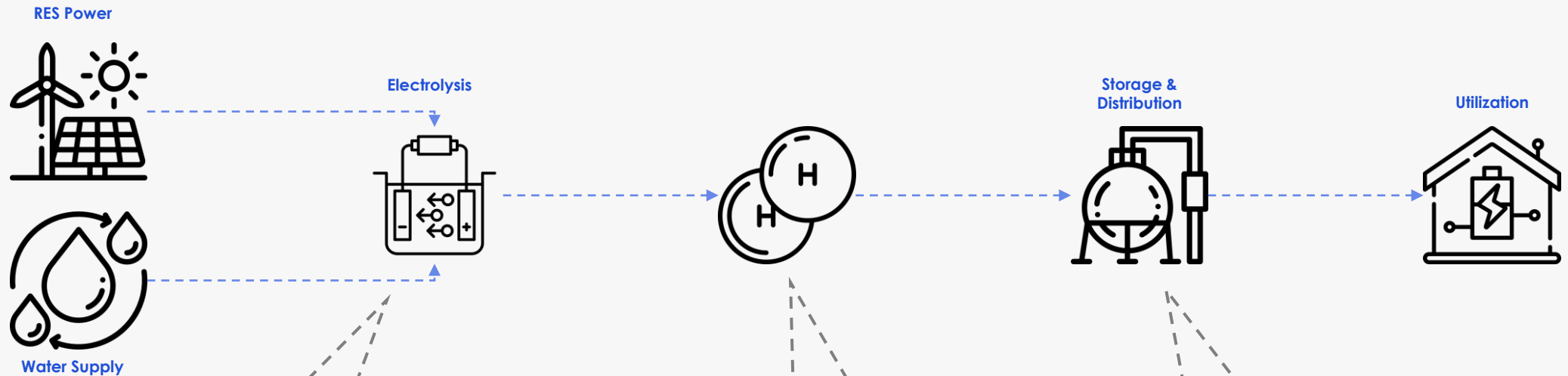
- Fertilizer Plant in Macedonia
- Cement Plant in Thessaloniki

# Renewable H2 - Production process



Renewable hydrogen (or "green hydrogen") is produced by the electrolysis of water using electricity from renewable sources and emits no greenhouse gases during its production.

High-Level Production Chain



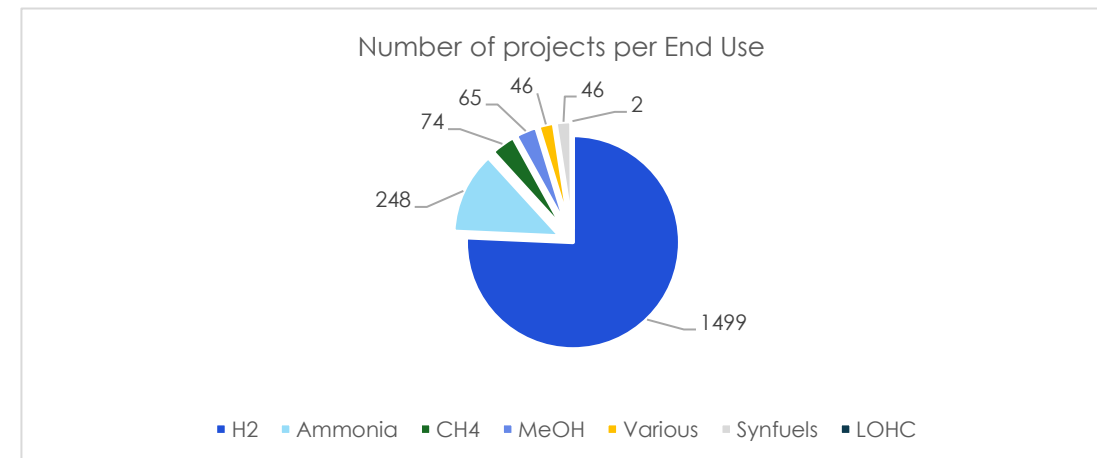
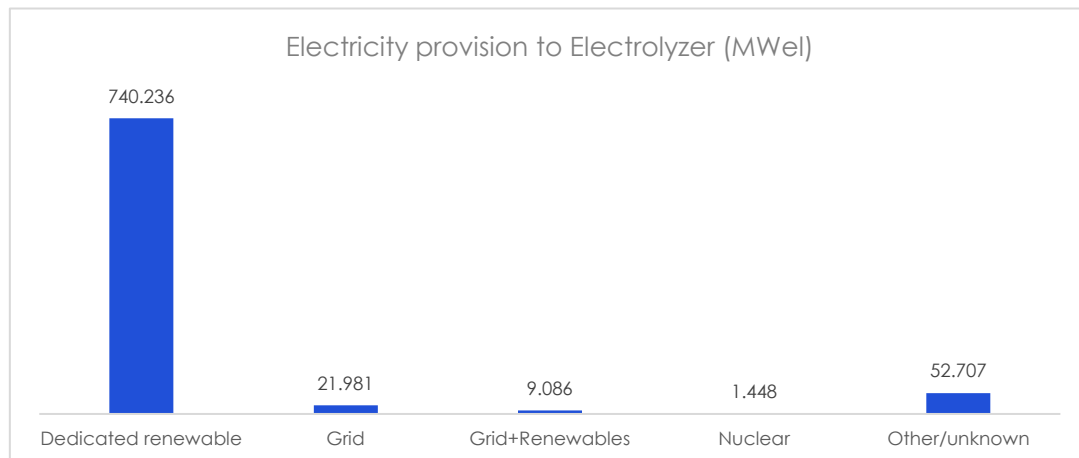
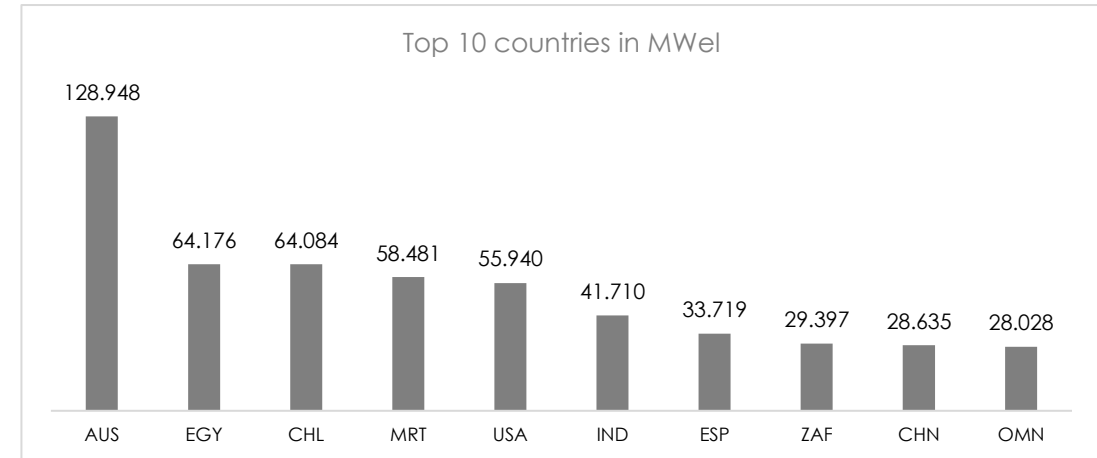
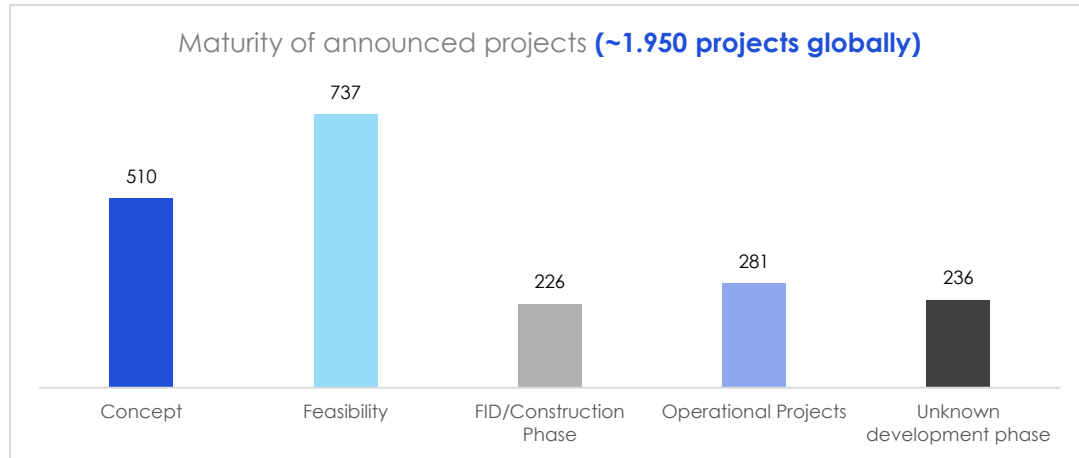
The electricity generated from RES is directed to an **Electrolyzer** (most mature technologies are Alkaline & Proton Exchange Membrane). An Electrolyzer consists of two electrodes (an anode and a cathode) separated by an electrolyte.

Water ( $H_2O$ ) is split into its constituent elements: **hydrogen gas** ( $H_2$ ) at the cathode and **oxygen gas** ( $O_2$ ) at the anode. The produced hydrogen gas may undergo purification processes to remove impurities

The purified hydrogen can be stored for later use or transported to various locations through pipelines, tanks, or other suitable means.

# Global Hydrogen Market – Current status

Based on the Global Hydrogen Review 2023, published by International Energy Agency, the number of announced projects for low-emission hydrogen production **is rapidly expanding (~1.950 projects)** with the annual production of low-emission hydrogen reaching 38 Mt in 2030, under the condition that all announced projects are ultimately realised. However, a small percentage of these projects have passed the Final Investment Decision (FID) tollgate, mainly due to the cost challenges.



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*Thank you for your attention !!*