HELIOS
ARAGÓN

Europe’s first natural hydrogen project in Aragón, Spain

OUR VISION

Deliver Europe's first natural hydrogen project in Aragón and expand activities across the EU

Produce the lowest cost and low emission hydrogen to supply local industry

COST

Produce natural hydrogen at <€0.75/kg

EMISSIONS

GHG emissions ~30 gCO2e/kWh

INFRASTRUCTURE

€900m investment in Aragón

JOB CREATION

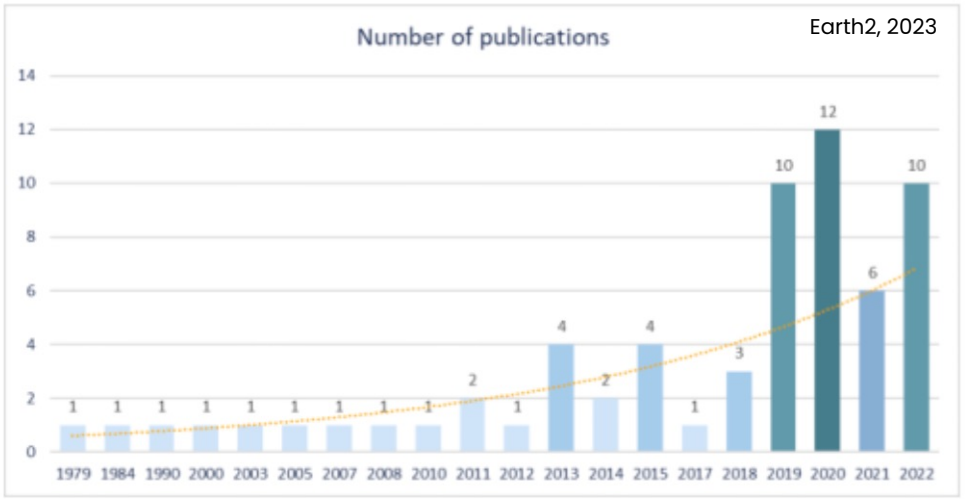
300+ direct
1500+ indirect

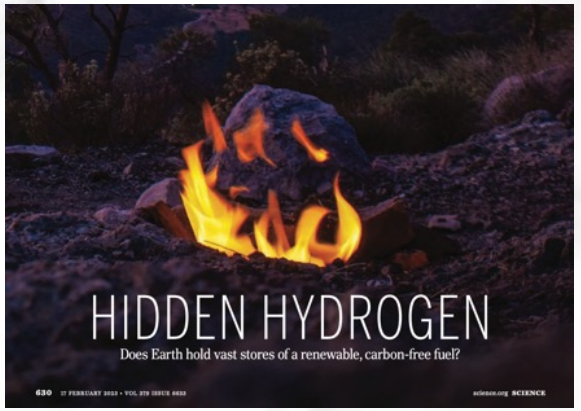
NATURAL HYDROGEN OVERVIEW

- Generated within the Earth by a variety of geological processes
- Can migrate and accumulate in large-scale deposits
- Increasingly recognized as having potential to revolutionize the clean energy transition
- Lowest cost and lowest carbon source of hydrogen
- No new technology for development, no requirement for storage, 24/7 production
- Europe is one of the most prospective regions; requires EU-wide legislation to follow France's lead from 2022
- First-mover companies securing high-potential acreage in areas with proven hydrogen ahead of new legislation

Continuously burning gas seep at Chimaera, Turkey with 10% hydrogen

NATURAL HYDROGEN AWARENESS



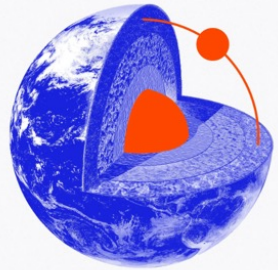


The New York Times

OPINION

A Gold Mine of Clean Energy May Be Hiding Under Our Feet

Feb. 27, 2023



ANALYSIS | Will natural hydrogen extracted from the ground be the next global gold rush?

The existence of naturally occuring H2 has been known about, but not well understood, for centuries — but this could be about to change, writes Rystad Energy Hydrogen Research

7 November 2022 11:16 GMT *UPDATED 7 November 2022 11:33 GMT*

By **Rystad Energy Hydrogen Research**

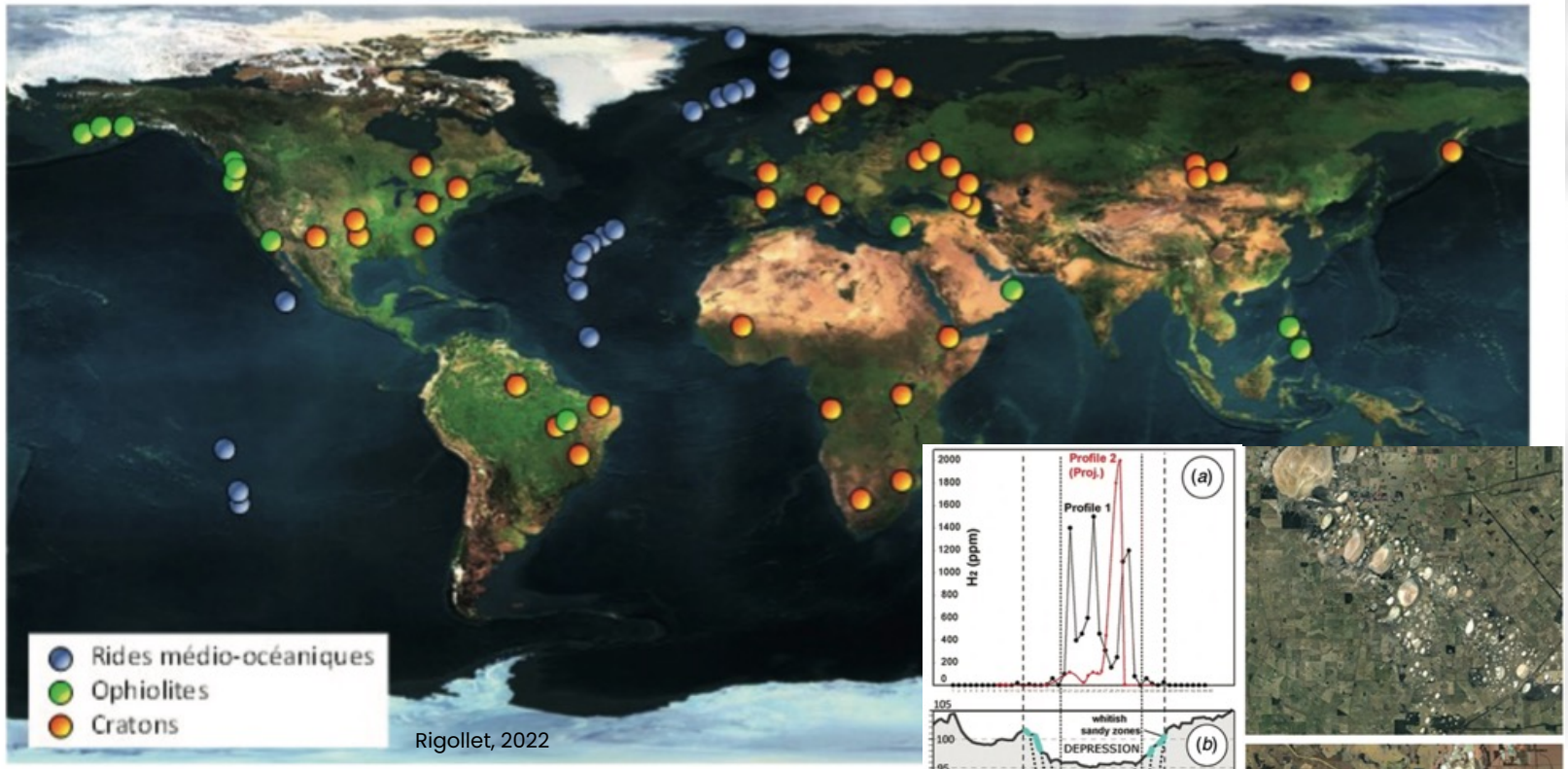
GEOSCIENTIST

The magazine of the Geological Society of London

Natural hydrogen: the new frontier

Geological hydrogen could revolutionise our low-carbon future. Philip J. Ball and Krystian Czado report on discuss

NATURAL HYDROGEN OCCURRENCES



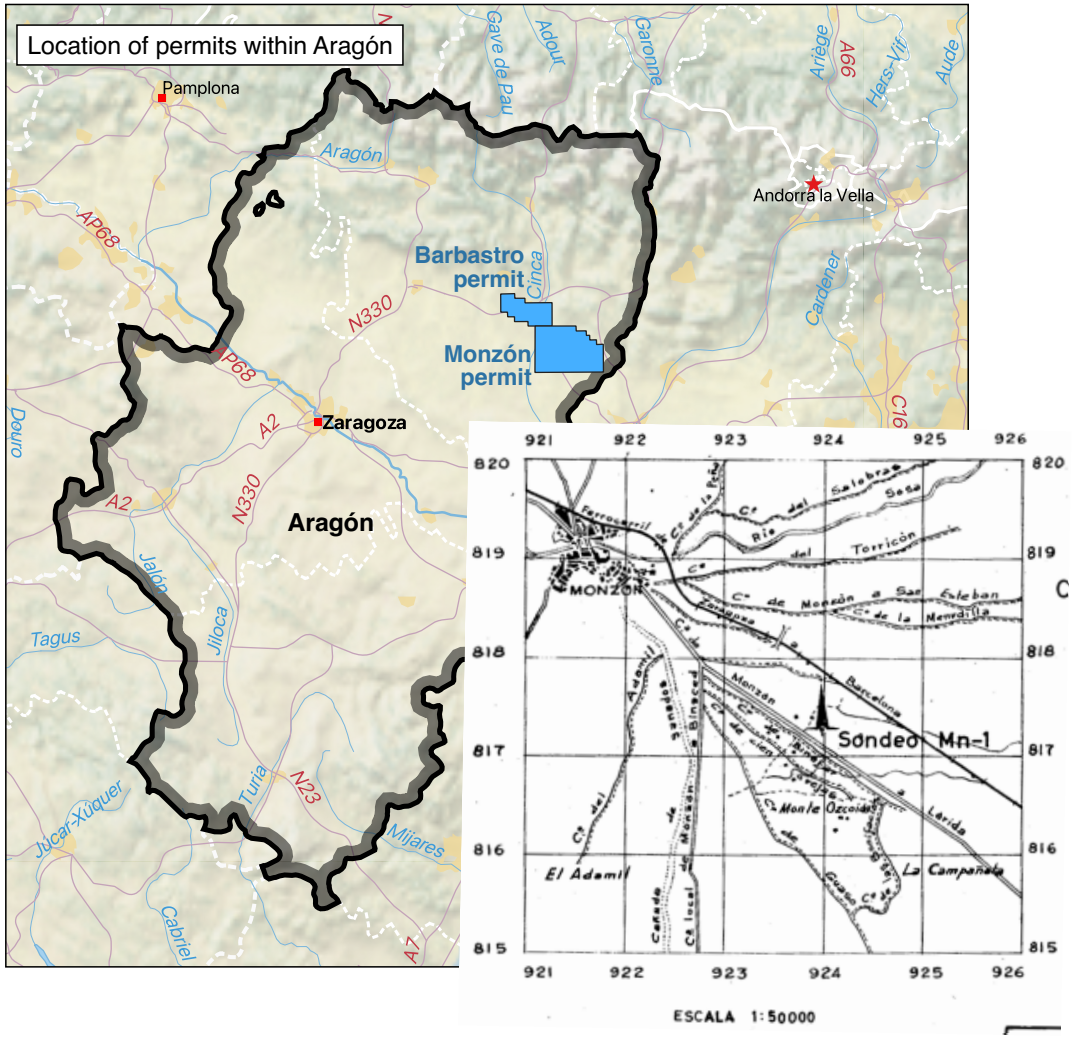
Rigollet, 2022

Stalker et al, 2021

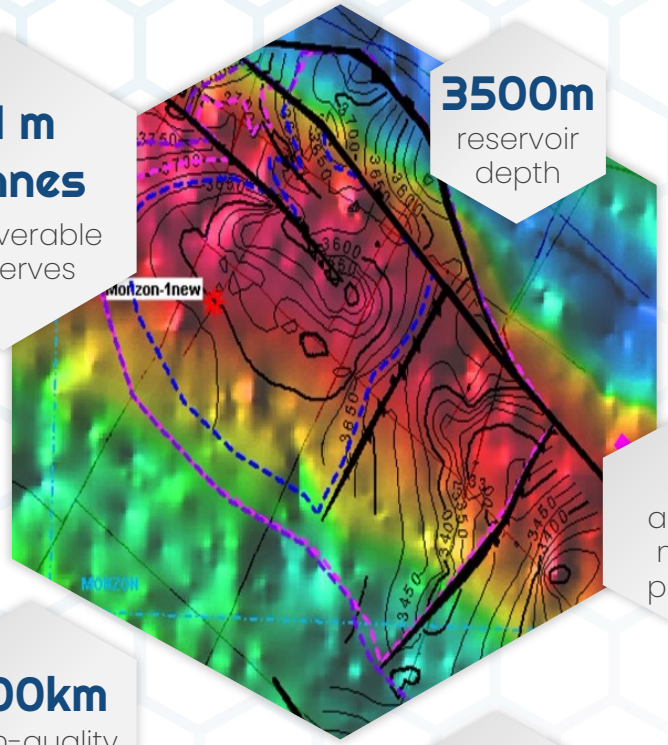
- Hundreds of global occurrences of natural hydrogen
- Produced at 98% purity in Mali from shallow depth to supply a local power station. 12 successful wells and field area of 50km^2
- In Iceland, geothermal power plants emit 1.2 kt per year
- Drilling in Africa and US. Wells in Aragón and Australia in 2024
- Hydrogen seeps often generate “fairy circles” and gas can be sampled at surface

NATURAL HYDROGEN IN ARAGÓN

- Monzón-1 drilled by ENPASA in 1963 to explore for oil and gas
- No hydrocarbons encountered but high levels of hydrogen recorded. Other wells in the region also contain hydrogen
- Hydrogen had limited uses at this time and therefore the wells were abandoned as oil and gas “dry” holes
- All elements required for large-scale accumulations of natural hydrogen exist in Aragón: a potent source linked by faults to well-defined traps, with quality reservoir (sandstone) and robust seals (salt)
- **This is the first documented example in Europe of a complete “hydrogen system”**



ASSET OVERVIEW



1.1 m tonnes
recoverable reserves

3500m
reservoir depth

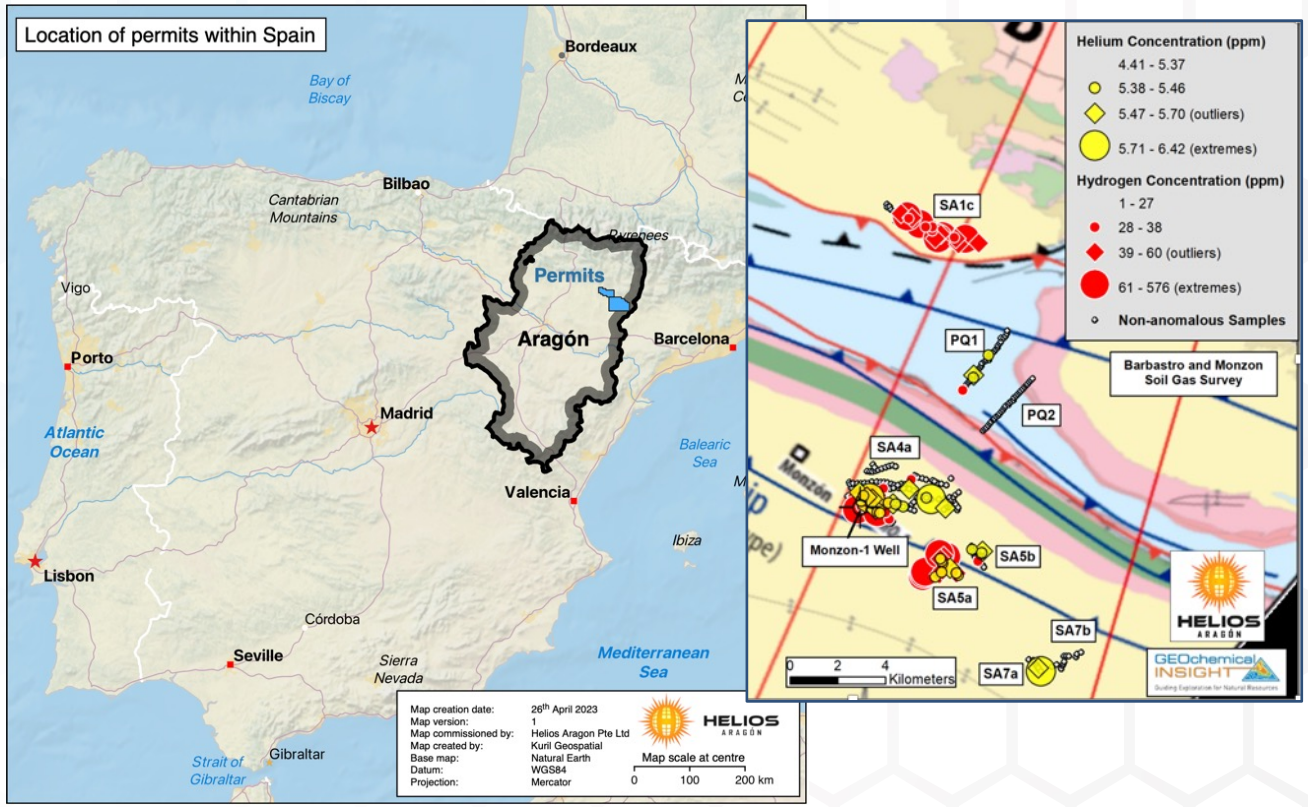
6
additional mapped prospects

300km
high-quality seismic data

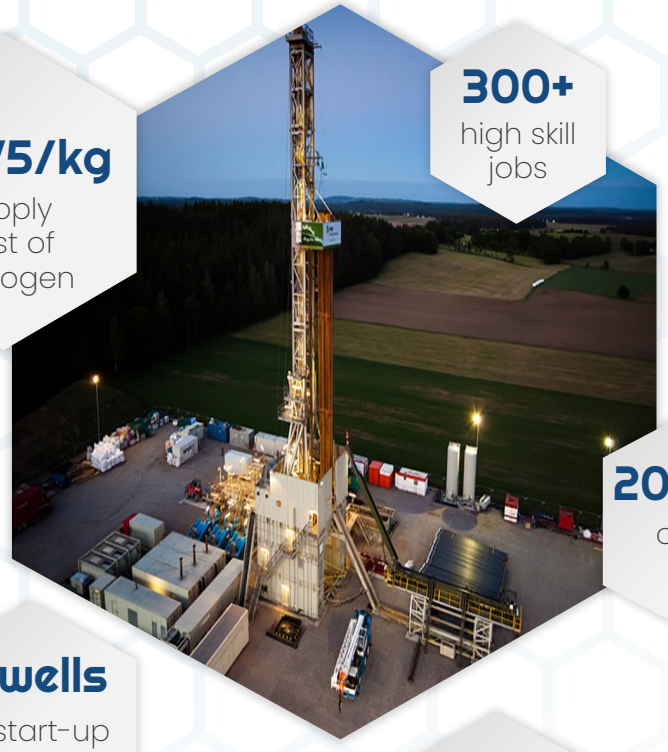
100%
hydrogen recorded in Monzon-1 well

Proven natural hydrogen discovery

- Monzón-1 well recorded 100% natural hydrogen with no hydrocarbons
- Geochemical survey confirmed high levels of hydrogen and helium
- Monzón Field defined by modern seismic and thick salt provides seal
- 1.1 million tonnes reserves with 5-10m tonnes additional prospectivity



PROJECT OVERVIEW



€0.75/kg
supply cost of hydrogen

300+
high skill jobs

20+ years
operating life

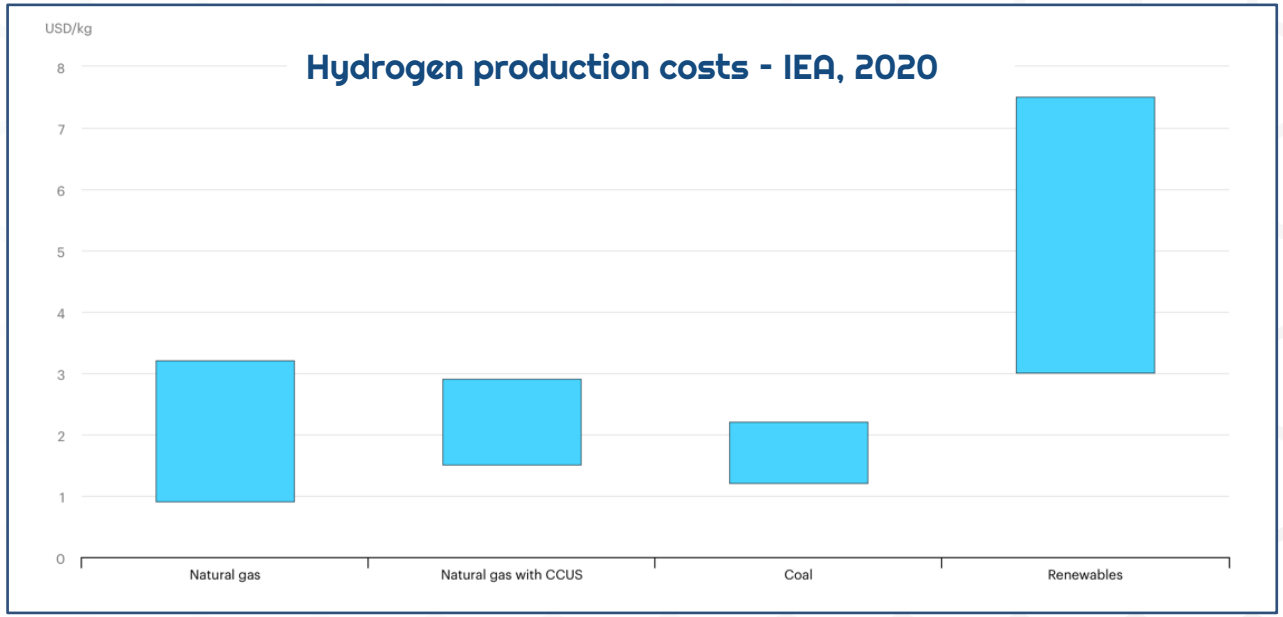
5 wells
at start-up

€500m
capital investment

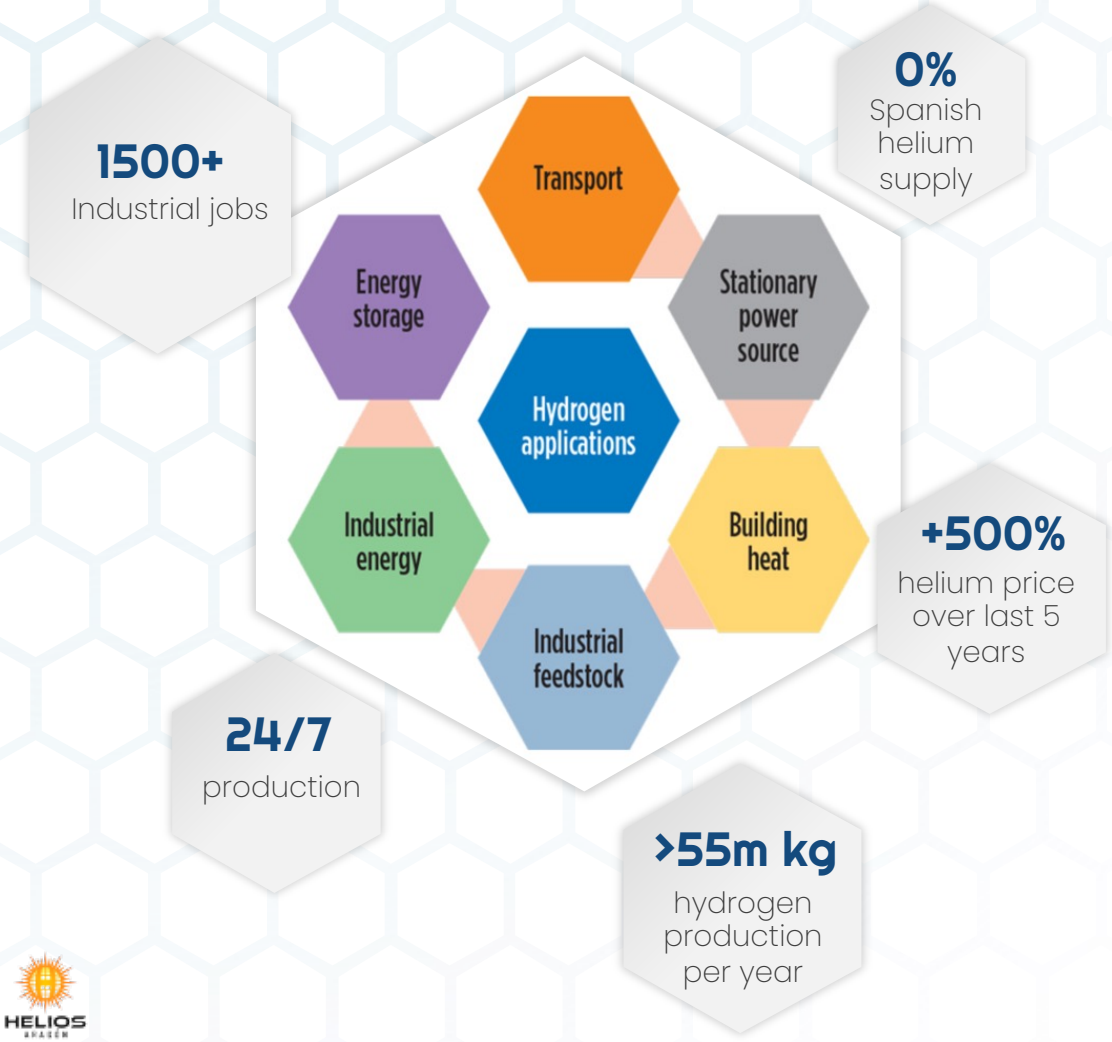
First production for local industry in 2028

- 2024 – Monzón-2 appraisal well (€12m)
- 2025 – Front end engineering and design (FEED)
- 2026 – Final investment decision (FID)
- 2026-28 – Construction and industrial off-taker facilities
- 2028 - First production

- Highest value is hydrogen supply to new local industry on brownfield sites, either as a feedstock (e.g., fuel cells and fertilizer) or energy source to replace natural gas to meet decarbonization mandates



INDUSTRY OVERVIEW



Local industrial revival from low-cost hydrogen and Spain's first helium supply

Hydrogen Valley

- Natural hydrogen can front-end low cost supply this decade ahead of wider adoption of green hydrogen
- Natural hydrogen can be produced using existing technology and expertise; no requirement for new technology
- Produces 24/7, requires no storage and can therefore supplement supply when renewables are not generating
- Very limited footprint – processing plant, wells and pipeline to industrial sites

Helium Technology Park

- Helium required by many advanced technology businesses and research institutes
- Global sources are limited, demand is growing and supply gap widening
- Helium is listed by the EU as a "Critical Raw Material"
- Spain has no helium production:
  - 10% of Spanish industry, directly or indirectly, is connected to its availability
  - 950 scanners and 4 million scans each year in Spain require helium

GREEN HYDROGEN STORAGE

- A green hydrogen economy requires significant underground storage at multiple sites
- The natural gas economy in Spain has required a storage capacity (in depleted reservoirs) of 35TWh
- The Monzón Field can be part of the solution. Once the reservoir is depleted it can be used as a low-cost, proven storage site for green hydrogen at annual rates of c.55 million kg
- Storage solutions for green hydrogen are lagging well behind the progress which is being made on electrolysers
- Legislation is required to promote investment. Australian States (South Australia and NSW) have recently included hydrogen storage and natural hydrogen production in their Hydrocarbon or Mining Acts

FUTURE FUELS CRC

"Widespread adoption of hydrogen in Australia as an energy carrier will require storage options to buffer the fluctuations in supply and demand, both for domestic use and for export. Once the scale of storage at a site exceeds tens of tonnes, underground hydrogen storage is the preferred option for reasons of both cost and safety"

FOUR PHASES OF COMMERCIALISATION

Elements in place for a successful project, with development legislation expected

INCEPTION 2020-22

1

- Seismic interpretation
- Satellite investigations
- Map the resource volume
- Geochemical soil gas survey

FEASIBILITY 2023-24

2

- Environmental assessment and well approval
- Drilling of appraisal well
- Confirmation of reserve size

DEVELOPMENT 2025-28

3

- Design, funding, development partners
- Offtake agreements
- Natural hydrogen legislation
- Final investment decision
- Construction

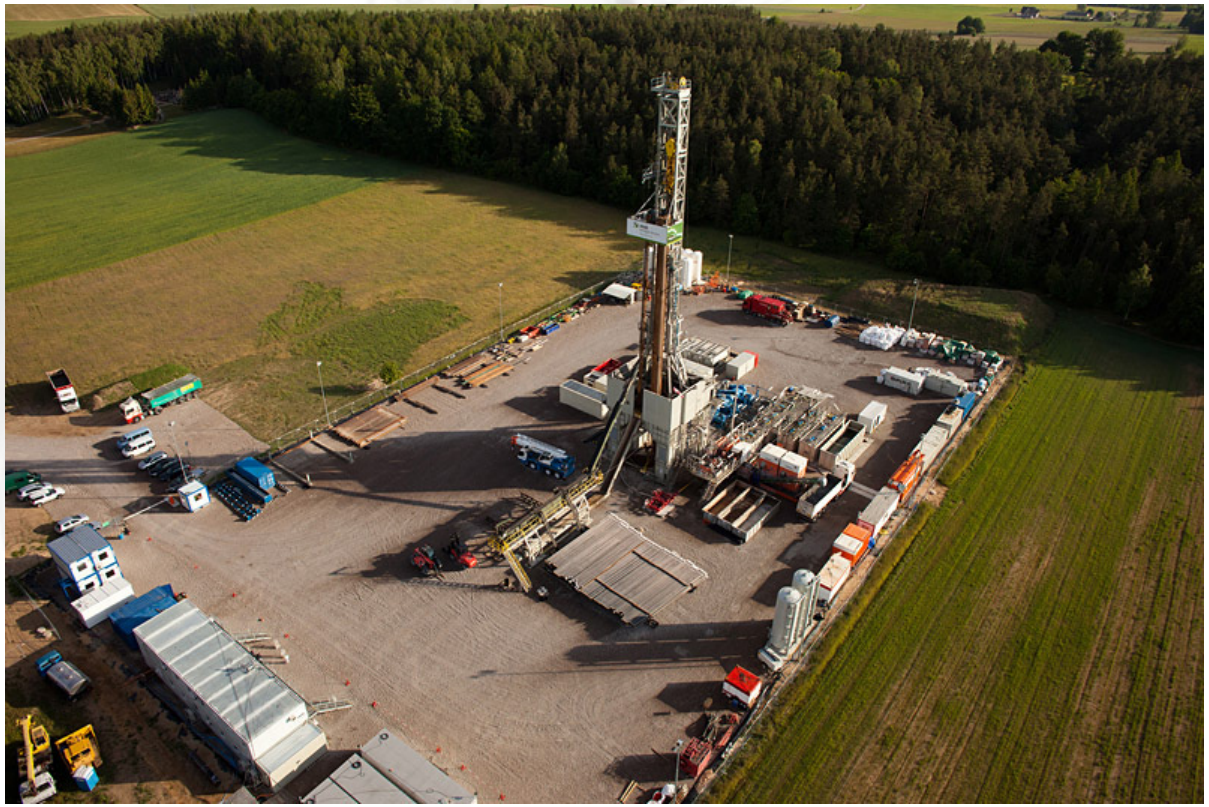
France has taken the lead in the EU, having modified the Mining Code in 2022 to include natural hydrogen

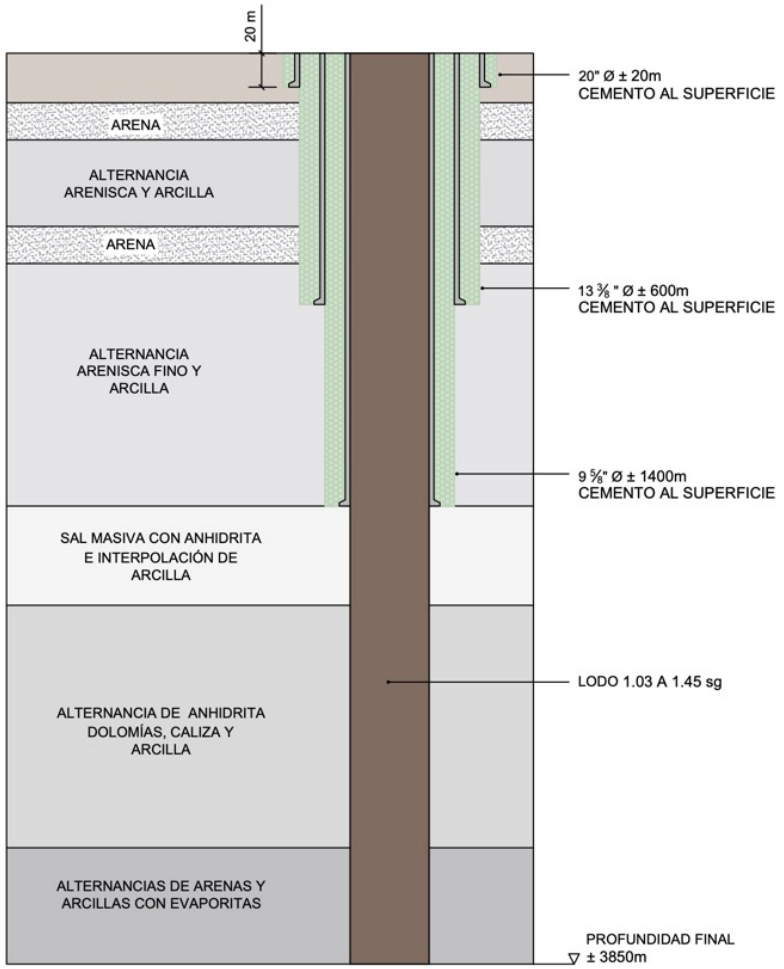
PRODUCTION 2028+

4

- Production of hydrogen and helium
- Develop adjacent fields
- Storage of locally produced green hydrogen

MONZÓN-2 IN 2024





OUR GOALS IN THE EU

- Produce low cost and low carbon hydrogen close to market
- Leverage first mover advantage to replicate Aragón project success elsewhere in Europe
- Provide energy security and independence, reducing the need for energy imports
- Decarbonize energy intensive industrial sectors, key to reaching national/European environmental targets
- Provide proven storage solutions for local green hydrogen production
- Provide numerous high-skilled job opportunities

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Contacts

CEO, Ian Munro (ianm@hapl.com.sg)

Chairman and Co-Founder, Dr Chris Atkinson (chrisa@hapl.com.sg)