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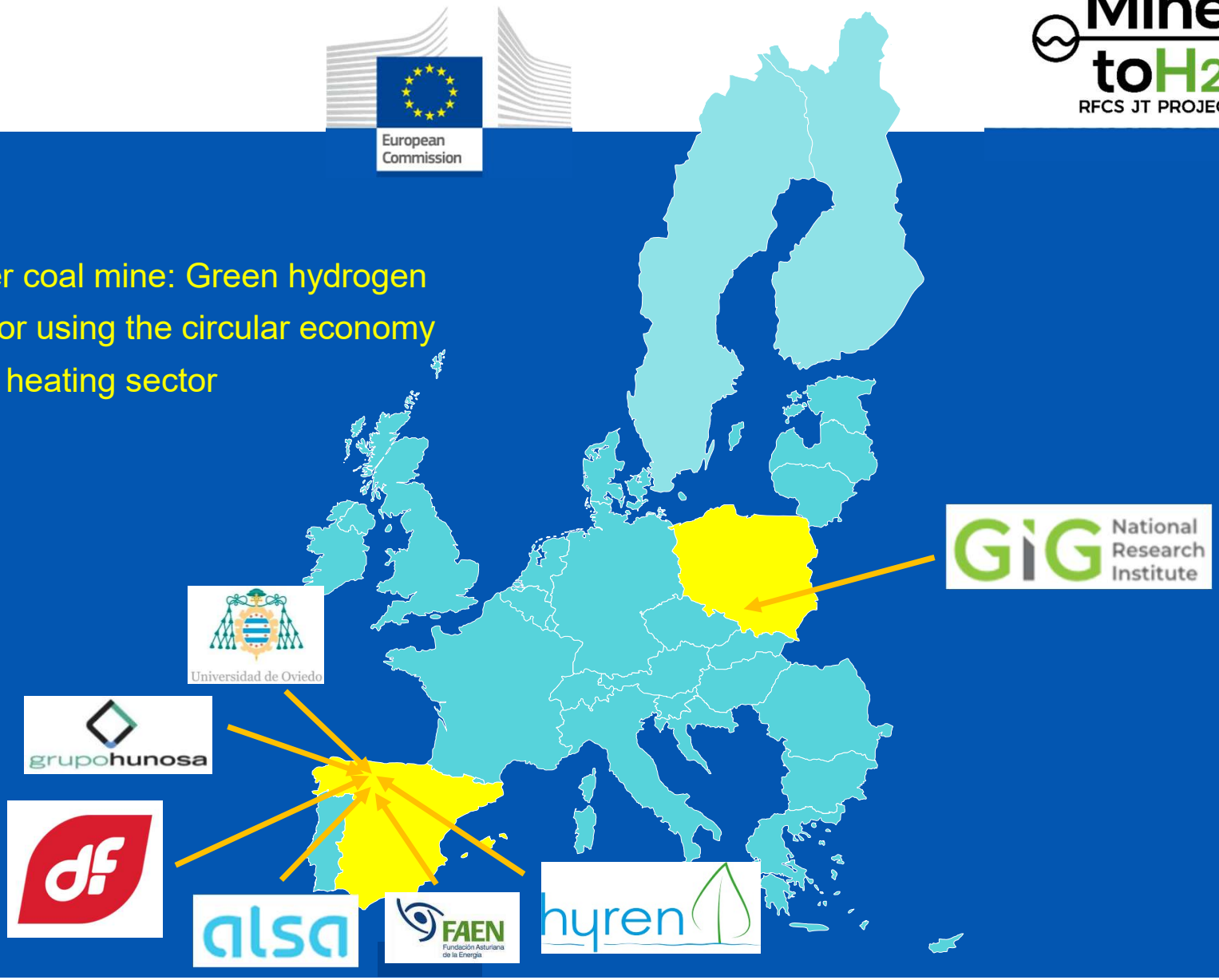
Research Fund for Coal & Steel

European Commission

Mine toH2
RFCS JT PROJECT

MINE-TO-H2

Repurposing a former coal mine: Green hydrogen for the transport sector using the circular economy and coupled with the heating sector



Call: *RFCS-2023-JT*
Instrument: *PDR*
Start date: 01/04/2024
End date: 30/09/2028
Budget: 18 052 926 €

Region of Asturias











- Asturias: centuries of mining history. Arnao Mine (1591 – 1915)
- +2.000 drift mines (underground)
- +73 vertical shafts
- 50-70% of hard coal national production for more tan two centuries

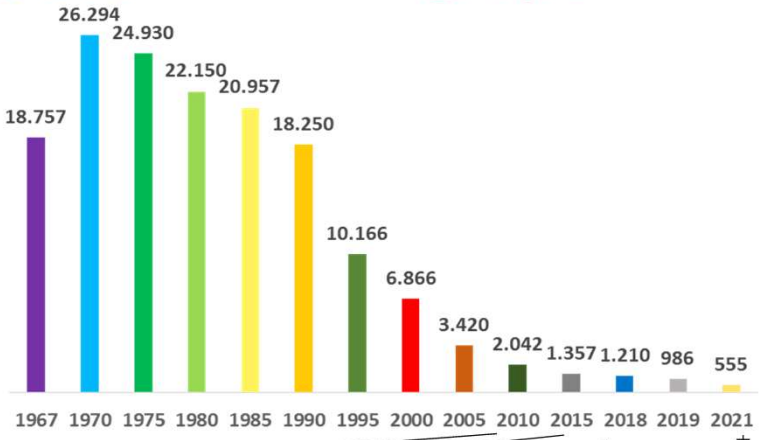
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HUNOSA. Coal mines operation

HISTORICAL EVOLUTION OF EMPLOYMENT

- Maximum number of jobs 26.590 (en 1969)
- Continuous reduction in the number of mines and workers since the 1970s



LA PEREDA POWER PLANT

- 50 MWe
- In operation since 1994
- Technology that allows the use of low calorific value coals, waste from dumps and wood residues (CFB boiler)
- Pilot plant for CO_2 capture – 1,7 MWth



ACTIVE COLLIERIES

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HUNOSA. New activities



Transformation of
La Pereda Power Plant



Geothermal Energy



Green hydrogen production



PV plants and restoration



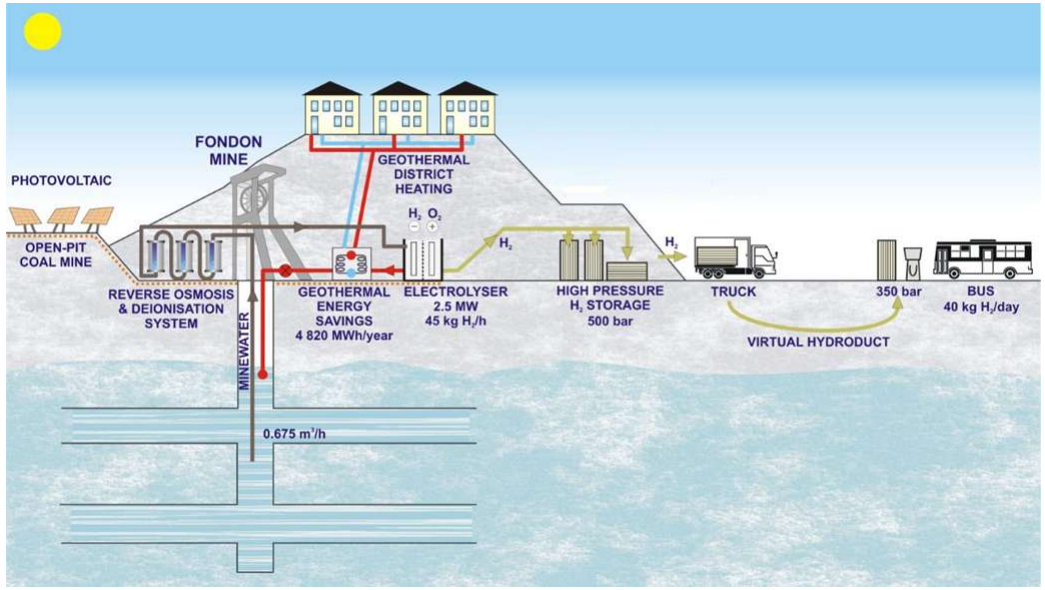
New uses for old facilities

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MINE-TO-H2. Main description

- Use of mine water
- Renewable Energy (PV 2,2 MWp + PPA)
- Electrolyzer 2,5 MW
- Heat recovery from electrolysis
- Compression, storage and transport
- Hydrogen fueling station



- Entry into service of 2 intercity buses: FCEV (Fuel Cell), HICEV (Internal Combustion Engine)
- Training and reskilling of former coal miners.
- Replicability study for other European coal mining regions.

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Project Strengths and Opportunities



- HUNOSA has disused industrial land at its mine sites.
- This industrial land is in areas well-connected and equipped with infrastructure such as electrical power supply, etc.
- The scale of the project allows you to 'perhaps' make a mistake with the technology
- The partners involved in the project are relevant actors in this sector: Duro Felguera as the EPC contractor, Hyren as an investor in new H2 projects, ALSA in the passenger transport sector, along with the University of Oviedo, GIG, and FAEN as experts in similar initiatives.
- The project will operate the first FCEV and HICEV intercity buses (ALSA). The refueling station will allow the number of H_2 vehicles in Asturias to expand.
- Possibilities to aggregate industrial demand in the region.

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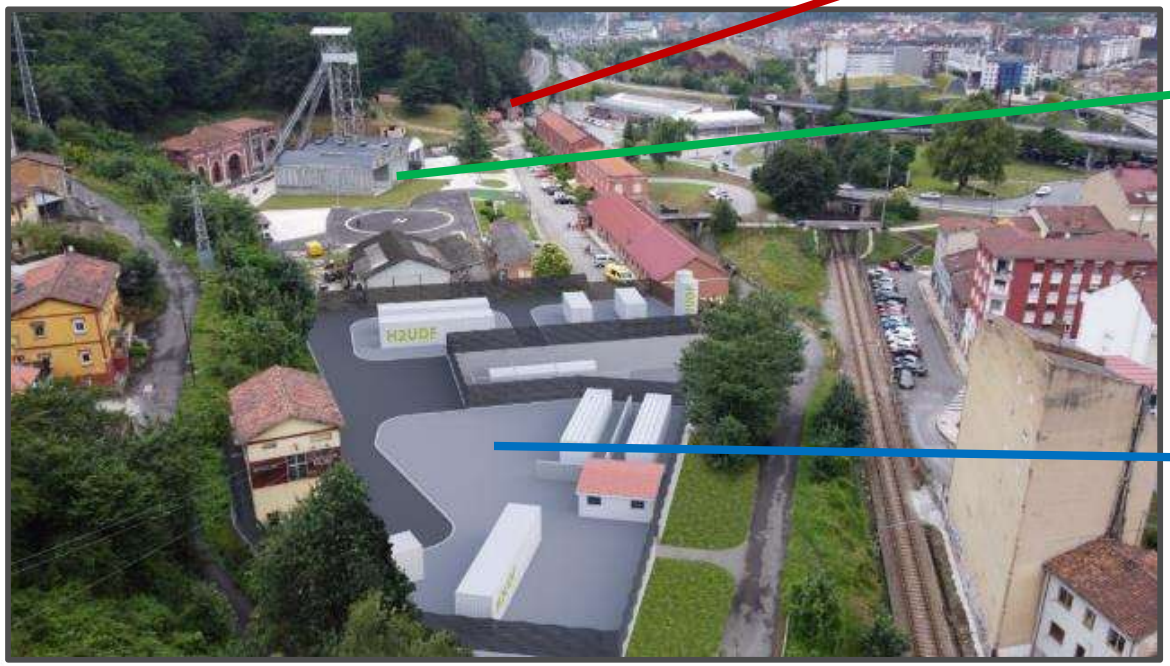
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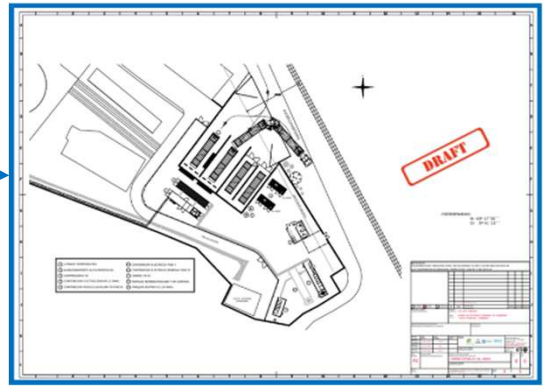
Location

- Recovery of mining area (Fondón Colliery)
- La Nalona Mine (drift mine)









grupohunosa

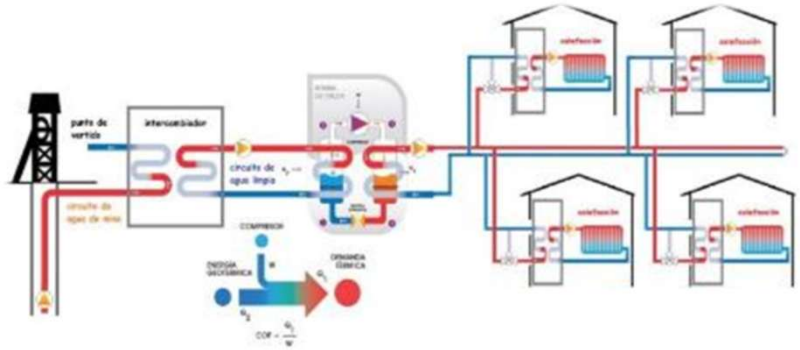
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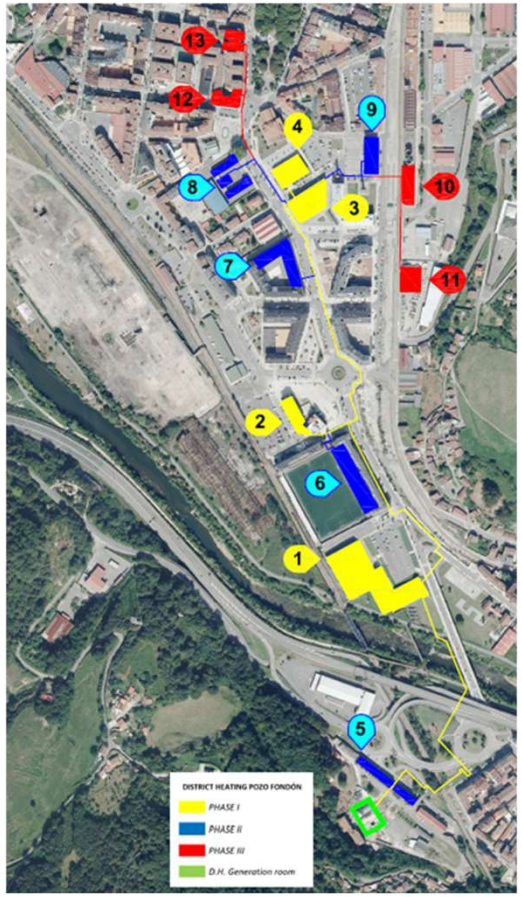
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Fondón District Heating Network

3MWth for 13 buildings La Felguera (Langreo)

Phase I (2022) Geothermal		Phase II (2024) Biomass
1,5 MWth	**+**	**1,5 MWth**





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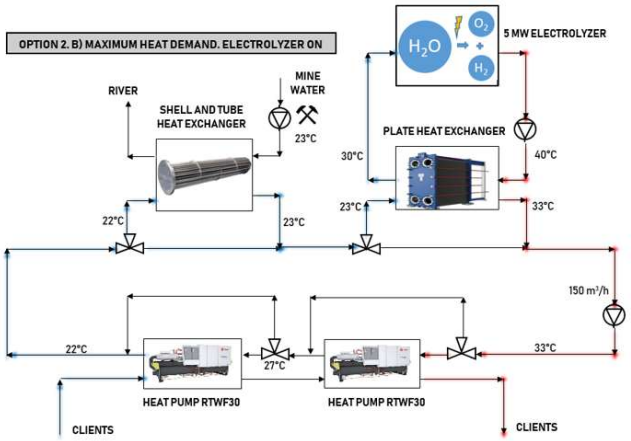
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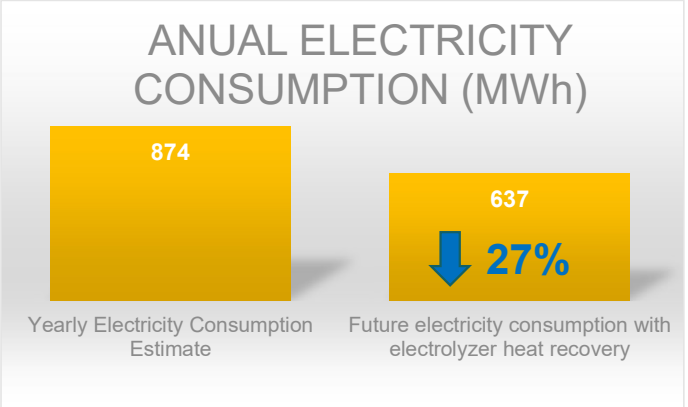
Technological challenges

1) HEAT recovery

- Cooling temperatures for PEM electrolysers: 30-40°
- Eficiency: a) electrolysis BT 65-75%

  b) heat-pumps water-water
- Heat recovery and integration with the district heating networks.





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Additional technical challenges

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STORAGE H2
630 bar



GREEN MOBILITY:
Intercity buses





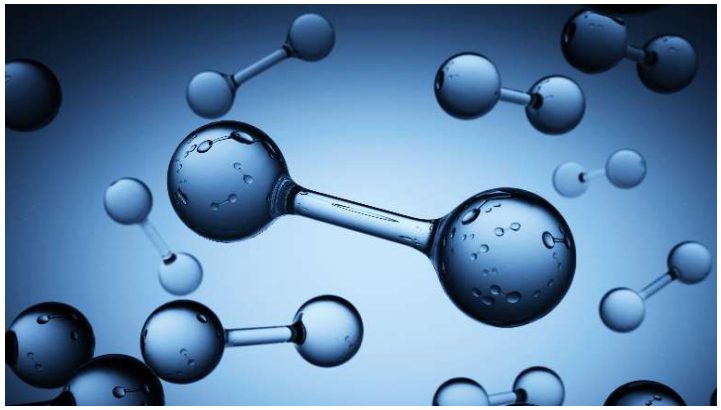
DIGITAL TWIN



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Communication & dissemination activities



- Reaching multiple audiences: coal mining companies, EURACOAL, UNECE, and hydrogen-related associations.
- Tools: user-friendly website, annual newsletters, promotional videos, presentations at relevant forums, publications, etc.
- Comparative assessment of coal mining companies, analyzing the feasibility of constructing green hydrogen plants for site repurposing.
- Training of coal mine managers on this business plan.
- Next steps upon project completion: providing feedback for the development of new policies, scaling up production if feasible, etc.

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Key aspects for HUNOSA



Coal Mine → Industrial Plant





Open Pit → PV Plant



RESTORATION + NEW RESOURCE

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Future projects

- Transformation of La Pereda Power Plant (50 MWe)
- High emissions of biogenic CO_2.



- CO_2 Capture Plan La Pereda 1,7 MWt
- HORIZON CaLby2030 Calcium Looping Tech.



- EU Directive RED III transforms RFNBO production from an environmental choice into a regulatory mandate.
- Option: learn from our experience and scalate our H_2 and CO_2 plants.

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Thank you for your attention



www.minetoh2project.eu

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