Regione Emilia-Romagna

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HYDROGEN COMMUNITY EMILIA-ROMAGNA

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Hydrogen Value Chain in Emilia-Romagna

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Hydrogen strategy - implementation

- **AGNES –** project Agnes on wind off-shore renewables aims to combine green hydrogen production with wind and solar energy **– Ravenna – planned 60MW electrolyser**
- **PNRR Hydrogen Valley - IdrogeMO – M2C2 investment 3.1–** implemented by SNAM-HERA-HERAMBIENTE in Modena – in construction
- **PNRR Hydrogen Valley - Hydrogen-powered mobile - M2C2 investment 3.1** –implemented by JMG CRANES in Sarmato (PC) – permitting phase and closing of tenders for supplies, design services and works
- AP in Interreg Project **GREEN HYDRA led by** Ravenna Municipality or the creation of the regional H2 supply chain
- **Hydrogen Regional Community FORUM** in collaboration with the GREENTECH and MECH clusters, the regional community has been launched with the following activities :

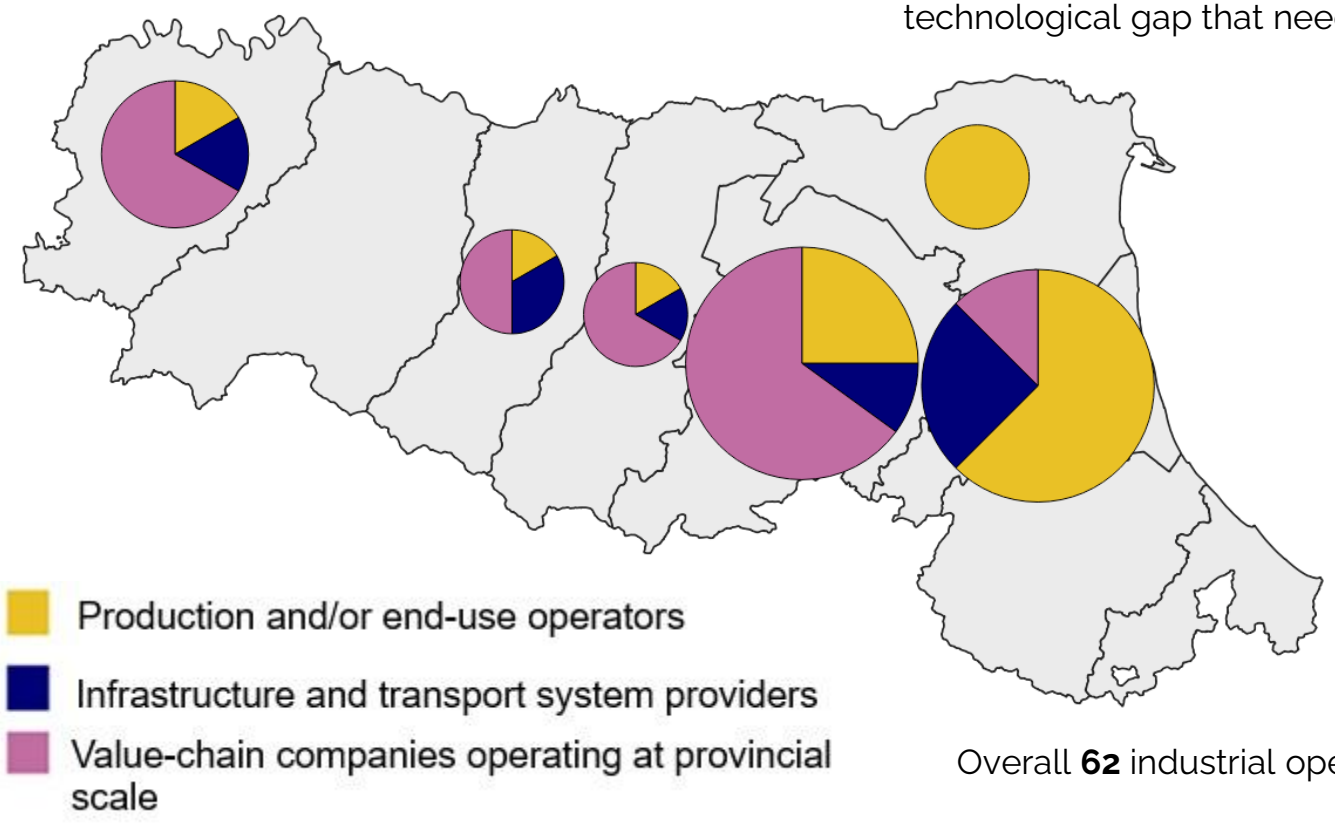
- **Creation of a reference group** for the discussion of regional policies to support hydrogen
- **Creation of regional value chains** for applied research and business for the use of hydrogen as an energy carrier
- Drafting of **REGIONAL H2 MAPPING**

Progress of Project TPER with first **hydrogen-powered buses** for local public transport – **first buses in service from January 2025**

Hydrogen Value Chain in the Regional Mapping

Industrial Stakeholders

- hydrogen value chain in Emilia-Romagna is mainly composed of companies with different expertise, but there is a prevalence of hydrogen component manufacturers.
- The highest geographical concentration is in the Bologna area, which has a strong tradition in advanced mechanics and industrial engineering
- There are few electrolyser manufacturers (only two active companies), highlighting a technological gap that needs to be filled

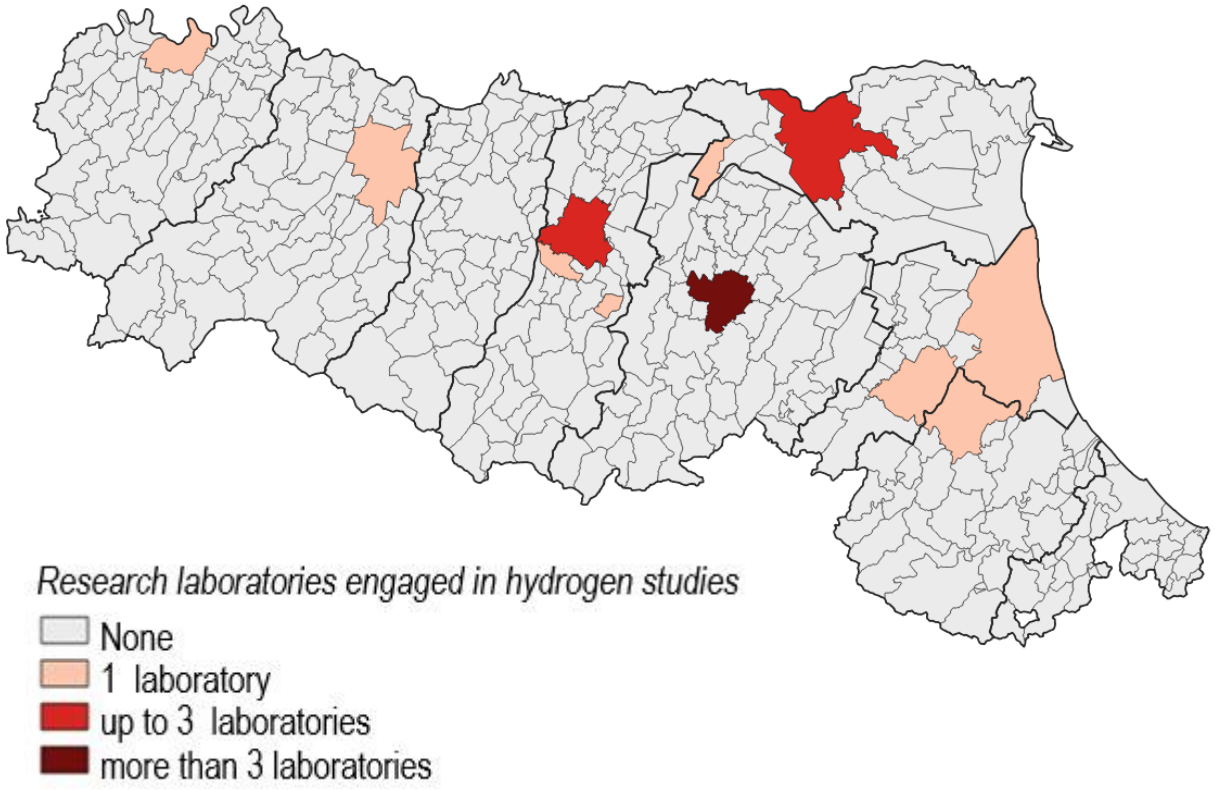


Activity	*Description*	*Number of Identified Companies*
Producers and/or Users	Producers and/or final users (including those participating in ad hoc partnerships for demonstration projects)	15
Value chain	Industrial actors within the value chain are mainly focused on the design and production of components	38
Infrastructure & Logistics	Specialized Operators in Hydrogen Storage, Distribution, and Transport	9

Overall **62** industrial operators actively engaged in various capacities within the hydrogen sector have been identified, primarily located in Bologna and Modena areas.

Hydrogen Value Chain in the Regional Mapping

Applied Research Laboratories and Innovation Centers

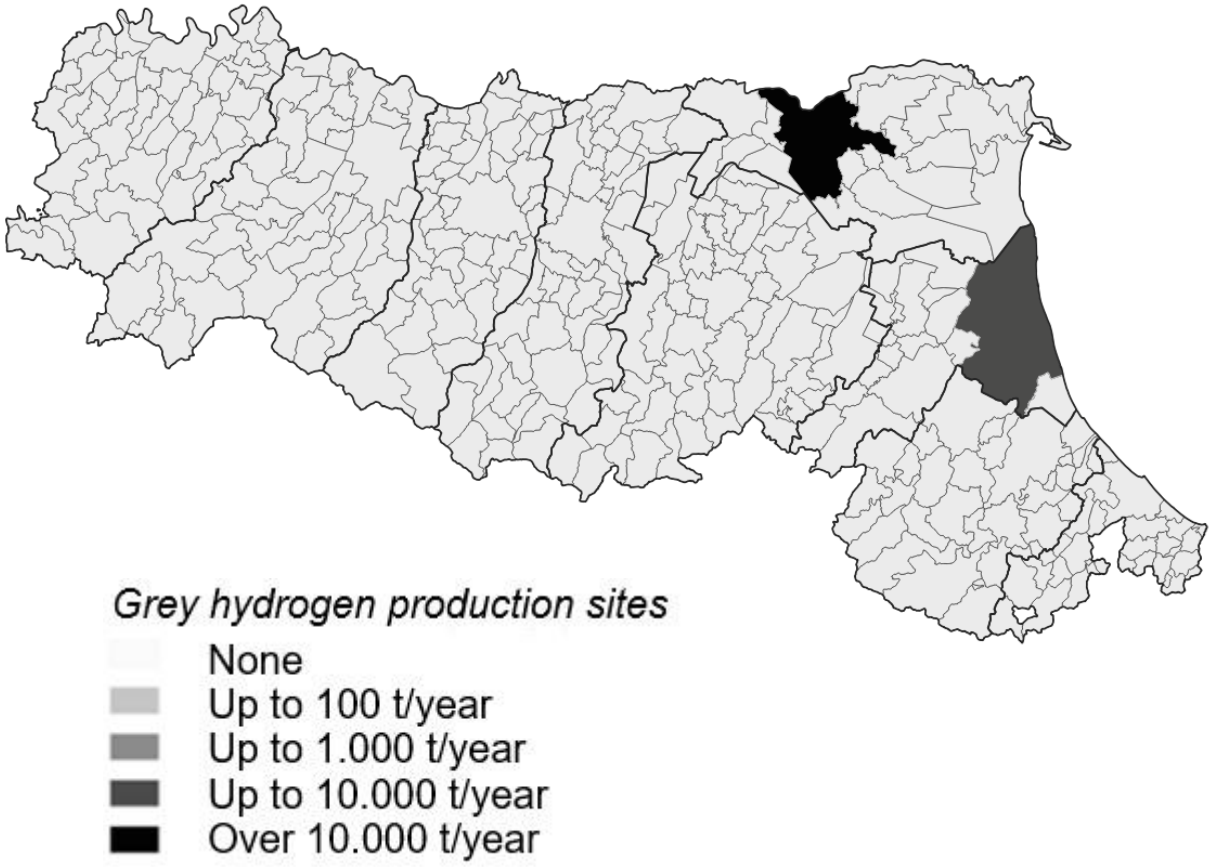


The analysis identified **20 laboratories** active in the hydrogen sector (16 public, 2 public-private, and 2 private).
The main areas of expertise are concentrated in **6 key domains**:

- Hydrogen Production
- Storage, Transport, and Safety
- Mobility and Hydrogen-Powered Vehicles
- End-Use Applications and Industrial Processes
- Materials Science and Advanced Components
- Cross-Cutting Competencies: Standards, Planning, and Digitalization

Current Status of Hydrogen Production

Grey Hydrogen Production in Emilia-Romagna



- In Emilia-Romagna, there are **3 grey hydrogen producers**, located between **Ravenna** and **Ferrara**, of which one accounts for **95%** of the regional production.
- The total production amounts to approximately **110,000 tons per year** (equivalent to about **400 million Sm^3 of methane**); Emilia-Romagna represents around **20% of Italian production**, holding the second position at the national level, behind Lombardia Region.
- Hydrogen is used **exclusively as a feedstock** for industrial processes, primarily in the **petrochemical and fertilizer** sectors
- The transition to **green** or **blue** hydrogen is considered **economically unsustainable** in the short to medium term, due to high costs.
- Alternatively, attention is shifting towards **CO_2 capture and sequestration (CCS)**, particularly in **Ravenna** and **Ferrara**, which is considered a **more feasible and cost-effective** solution in the short term.

Future Hydrogen Production

Green Hydrogen trasnsport grid

The development of infrastructure for the distribution, transport and storage of hydrogen is a fundamental prerequisite for the large-scale development of this energy carrier, but significant challenges must be addressed, particularly in terms of efficiency, safety and compatibility with existing infrastructure.

Main initiatives:

SouthH2 Corridor

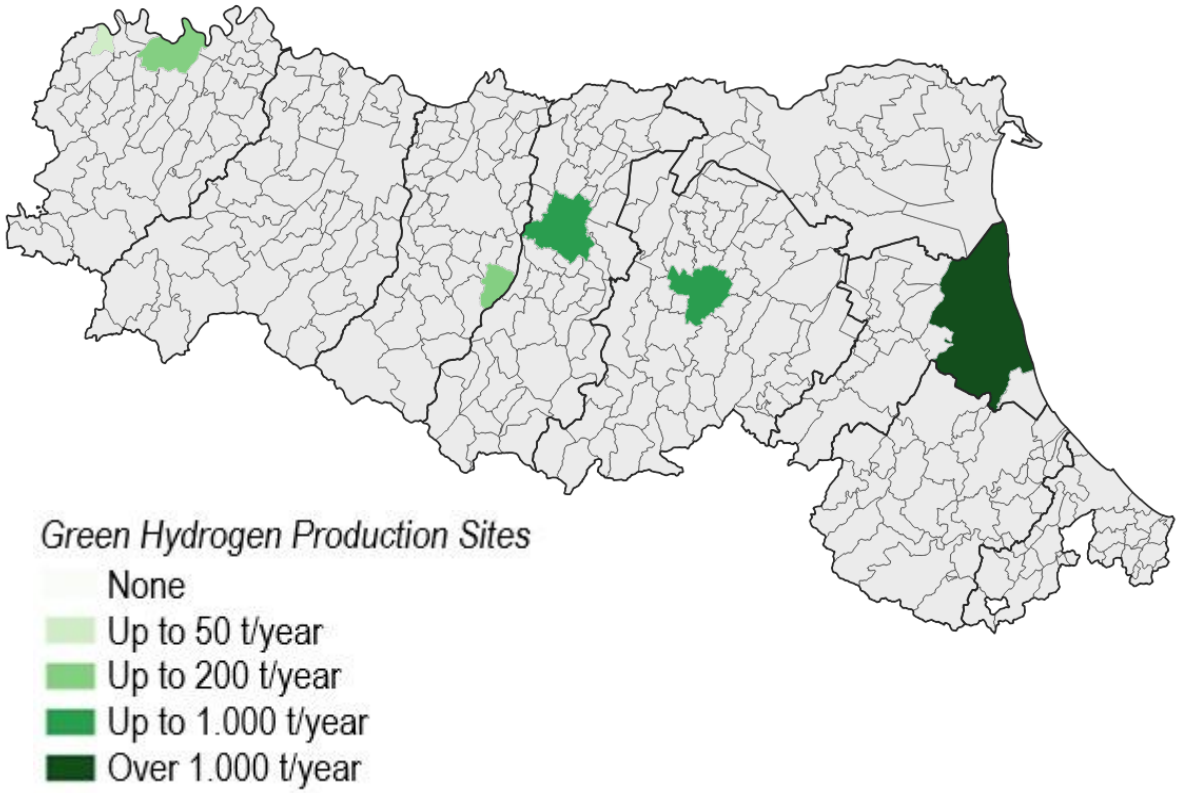
SnamRefuelling station in Piacenza

Edison

NextTrials to verify the compatibility of the methane network for CH4/H2 mixtures - InRete/Hera

Future Hydrogen Production

Green Hydrogen production in Emilia-Romagna



Timeframe	Producer/End-User	Estimated Production (ton/year)	Estimated Utilization (ton/year)
2025-2030	Hydrogen Valley Modena IdrogeMo	230	
	Hydrogen Valley Sarmato JMG cranes	33	33
	Edison Next/Iris	132	132
	Edison Next/Stazione Rifornimento (HYmot)	70 (stima)	0
	TPER	400	900
	Total	**865**	**1.065**
2030-2035	Agnes	8.000	
Total		**8.865**	**1.065**

Future Hydrogen Demand/offtake

Sector	BAS scenario	DECARBONIZATION scenario
Industry	11	49
Transports	3	12
Public services and sale activities	0	4
Agriculture and fishery	0	1
Total	**13**	**66**

Forecasts for hydrogen consumption by sector in Emilia-Romagna in 2030 (ktoe)

Source: strategic document 'The path to carbon neutrality before 2050' approved by Regional Council Resolution No. 1610/2024

Future Hydrogen Demand/offtake

Sector	ATECO codes	Number of active enterprises	Number of active enterprises with more tan 10 workers	Natural gas consumption (ktoe)	Potential green hydrogen consumption (kt H_2)
Industrial uses (IU)	• Industria chimica e petrolchimica	570	203	55	**0,7**
Hard to abate (HTA)	• Minerali non metalliferi • Industria della carta e della stampa • Siderurgia • Metalli non ferrosi	2.972	565	905	**31,5**
TOTAL		**3.542**	**768**	**960**	**32,2**

Blending in the gas grid: If hydrogen were to be mixed into the gas network at 2% vol., the quantity of hydrogen would be approximately **17 kt H_2/year**

Hydrogen Value Chain in the Regional Mapping

Geography and strategy

Theme with a strong territorial focus

Three centres/types of interest have been identified:

The chemical hubs of Ravenna and Ferrara, current users of grey hydrogen in industrial processes and potential users of green hydrogen.

The areas of Bologna, Ferrara and Modena, active in research and experimentation with new solutions, including for use in public transport, such as TPER in Bologna and Ferrara and the H2 MORE interdepartmental research centre.

The logistics districts of Piacenza, Ravenna and Bologna, equipped with ports, airports and logistics hubs for heavy road transport, given their interest in introducing green hydrogen for the decarbonisation of passenger and freight transport.

LESSON LEARNED

Regional value chain in a nutshell

- **Regional production:** grey hydrogen production amounts to approximately 110,000 tonnes per year, and projects are underway to produce an additional 9,000 tonnes per year of green hydrogen

- **Active companies:** 62 companies have been identified as being involved in various ways in the hydrogen sector, mainly concentrated in the provinces of Bologna and Modena

- **Research laboratories**: 20 research laboratories and innovation centres, mainly public or mixed public-private, have been identified as being involved in the testing of innovative technologies in the hydrogen sector

- **Research and innovation projects**: 33 research projects have been identified, 10 of which are promoted by companies and 23 by research laboratories, focusing on hydrogen production, materials and components, storage, transport, mobility and end uses

- **Green hydrogen plants and demonstration projects**: 3 green hydrogen production plants in the start-up phase, 2 new plant projects, 1 refuelling station under construction

LESSON LEARNED

main takeaways

- **Dynamism and growth of the supply chain:** the hydrogen supply chain in Emilia-Romagna is undergoing rapid evolution and is quickly taking shape. In just two years, there has been a significant increase in projects, experiments and collaborations between companies, research bodies and institutions. Pioneering projects such as Hydrogen Valley, refuelling stations in Piacenza and Bologna, and the “H2 Factory” and “AGNES” projects.

- **Development prospects:** particularly relevant in the sectors of sustainable mobility and “hard-to-abate” industries; possible use in blends in the gas network

- **Critical issues:** high costs, low technological and market maturity, fragmentation of projects

- **Necessary actions:** investment in infrastructure and production from renewable sources, demand stimulation policies, regulatory simplification, continuous support for research and innovation, strengthening of collaborative networks at regional, national and European level

- **Conclusion:** Emilia-Romagna has all the preconditions to become a strategic hub in the hydrogen supply chain; integrated governance, targeted investment and effective support policies are essential to ensure scalability and competitiveness

Thank you

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