

Social Perception Study on Underground Storage of Renewable Hydrogen

Andalusia

Executive Summary



MAY 2026

EUH2STARS

The European project **EUH2STARS (European Underground Hydrogen Storage Reference System)** is a large-scale industrial initiative aimed at demonstrating the technical, economic, and operational viability of underground storage of renewable hydrogen in depleted natural gas fields. Partially funded by the Clean Hydrogen Partnership under the Horizon Europe programme, the project brings together a consortium of eleven partners from five countries covering the entire value chain of hydrogen storage.

The main objective of EUH2STARS is to achieve a high degree of technological maturity (TRL 8 or 9) by conducting four complete cycles of hydrogen injection and extraction in a depleted gas field at a real scale, located in Austria. The results will establish technical, regulatory, and integration guidelines within the European energy system, as well as facilitate the replicability of these solutions in Hungary, the Netherlands, and Spain.

TRINITY ENERGY STORAGE

Trinity Energy Storage is an energy company specializing in the development, operation, and maintenance of underground energy storage infrastructures, with a particular focus on renewable gases and hydrogen. The company actively participates in EUH2STARS, leading the integration analysis of these infrastructures into the European energy system and advancing its own projects in Spain, such as the Aljarafe Project, aimed at converting former gas fields into renewable hydrogen storage.

Both the EUH2STARS project and the research activities carried out by Trinity Energy Storage delve into the development of solutions that will enable the **integration of renewable hydrogen into the energy system and advance towards a more flexible, secure, and decarbonised model.**



Demonstrator by RAG Austria AG in the locality of Rubensdorf.

STARTING POINT

As part of the EUH2STARS project and under Work Package 1 – which refers to **Public Participation and the Social and Legal Feasibility** of the project – a **social perception study on Renewable Hydrogen Underground Storage in Andalusia** has been conducted in collaboration with the company The Onion Inside.

OBJECTIVE

The main objective has been to understand the general population's perception of renewable hydrogen, its **uses, benefits, and the possibility of its underground storage.**

METHODOLOGY

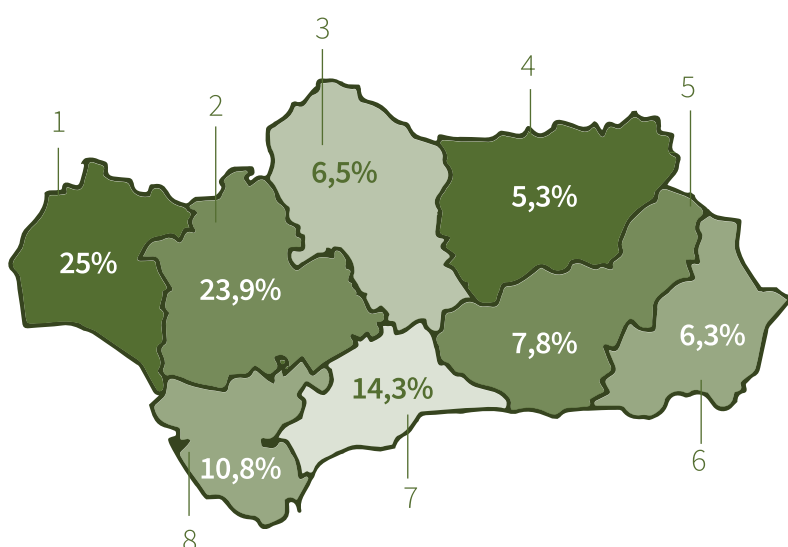
- A quantitative methodology was proposed to obtain clear indicators and show the current positioning of society regarding renewable hydrogen.
- The indicators can be replicated at different times to understand if there has been any change in perception-evaluation.

SAMPLE

General population aged 18 and over residing in Andalusia.

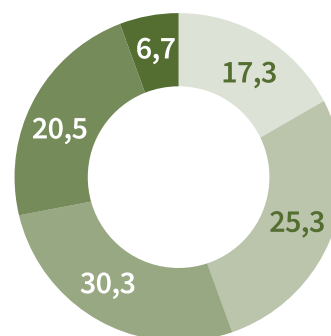
Sample – Andalusia: 1,200 surveys with a sampling error of ± 2.83 , providing **high precision of the data.** The surveys were distributed across the provinces of the community, **focusing on Seville and Huelva.**

Where the surveys were conducted (%)



- | | | |
|------------|------------|-----------|
| 1. Huelva | 4. Jaén | 7. Málaga |
| 2. Seville | 5. Granada | 8. Cádiz |
| 3. Córdoba | 6. Almería | |

Who responded: by age (%)



- Silvers (+75)
- Boomers (61 - 75)
- Gen X (46 - 60)
- Millenials (31 - 45)
- Gen Z (18 - 30)

Attitudes of Andalusians towards the environment



LEVEL OF AWARENESS

70%

Are concerned about the environment

66,1%

Are willing to make **changes in their lives** to reduce environmental impact

ATTITUDE TOWARDS CLIMATE CHANGE

26,2%

Of Andalusians believe the problem is exaggerated. This indicates that climate change is a **real issue** for Andalusians.

RENEWABLE ENERGIES

63%

States that they reduce dependence on other countries

62,2%

Believes that Spain should maintain a position as a leader in the transition

CONCLUSION

Society is not only **concerned** but also **willing to take action**. Andalusians stand out, compared to Spain, in their greater emphasis on the **independence from other countries** that **renewable energy development entails** (63% vs 59,3%).

Knowledge about renewable hydrogen



KNOWLEDGE AND DEFINITION

44%

Of the Andalusians claim to have heard something about the topic. They score significantly higher compared to Spain (vs 34,7%)

Clean energy

Among those who claim to know it, 30,1% define it as clean and low-polluting energy

From renewables

13,3% highlight the idea that it is produced from renewable energies

Men: Gen X and Boomers

Those who claim to know it best

Huelva

The region with the highest knowledge, at 62,7%

MAIN USES

83,4%

Links some suggested use with renewable hydrogen, especially as fuel for cars and as a means of storing excess renewable energy.

37,8% To serve as fuel for a car

37,6% To store excess renewable energy

32,3% Industry

30,8% Heavy transport

24,9% To heat the house

INTEREST

In a suggested manner, we present the respondents with a definition of renewable hydrogen to gauge their opinion and interest in it.

74,6% Of the Andalusians find renewable hydrogen quite interesting. Notably, 40% are very favourable.

Spain

Andalusians show more interest (74,6%) than Spaniards (70,4%)

Over 60s

They are the ones most in favour of the definition

Málaga and Seville

Those that stand out for greater interest compared to Cádiz and Córdoba

ADVANTAGES

96,5%

Of the Andalusians, some perceive an advantage in the use of renewable hydrogen.

49,8% Allows for the storage of renewable energy

22,2% Reduces pollution and emissions in hard-to-electrify industries

12,9% Strengthens the country's energy independence

11,6% It is an alternative to the use of natural gas

Knowledge about underground storage of renewable hydrogen (I)



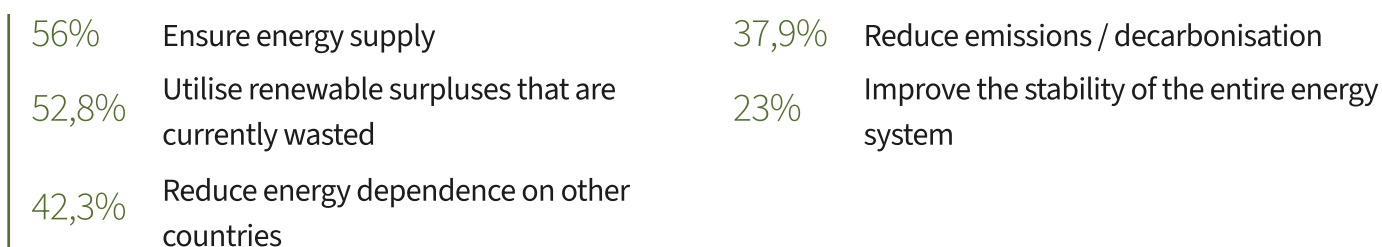
KNOWLEDGE

There is a **level of ignorance** about underground storage of renewable hydrogen similar to the rest of Spain (87,1% vs 88,9%).



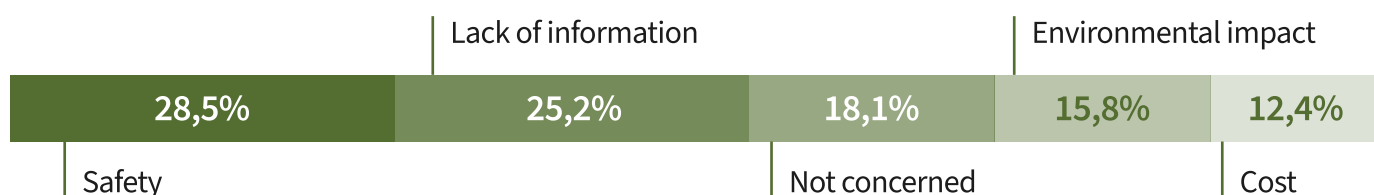
PERCEIVED BENEFITS

People in Andalusia perceive more benefits than Spaniards. Only **3,3%** deny that there are any, compared to **5,6%** of Spaniards.



ASSOCIATED CONCERNS

Safety is the biggest concern for nearly a third of Andalusians, along with the **lack of information**.

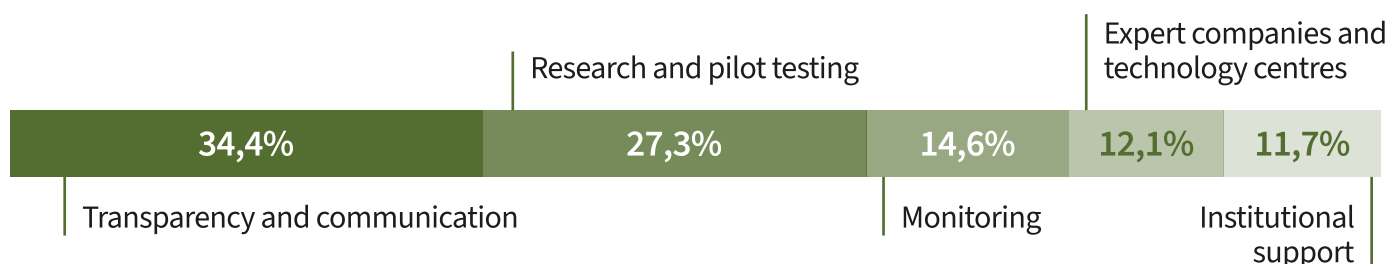


Knowledge about underground storage of renewable hydrogen (II)



ACTIONS THAT BUILD TRUST

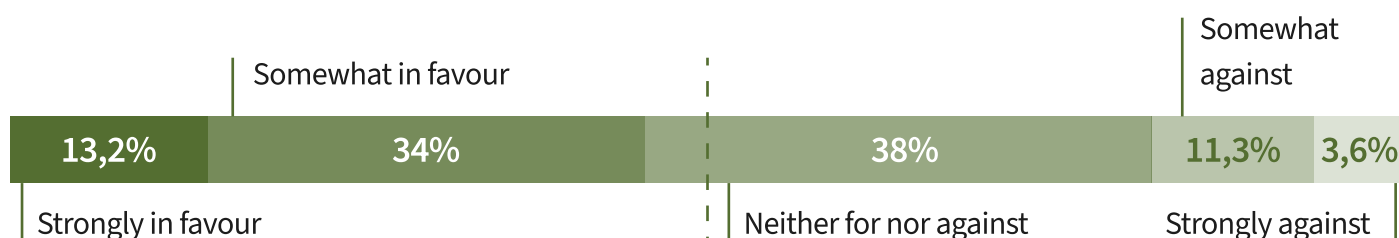
To address these concerns, respondents demand transparent and open communication at **34,4%**, and that activities are based on research and pilot tests at **27,3%**.



POSITION ON A PROJECT IN YOUR AREA AND REQUIRED GUARANTEES

47,2% Of Andalusians are **in favour** of this type of project, with no significant differences compared to Spain (**45,1%**).

38% Of Andalusians remain **neutral**, which may relate to a **medium-low level of knowledge** on the subject. Only **3,6%** are **strongly against** (vs **4,9%** of Spaniards).



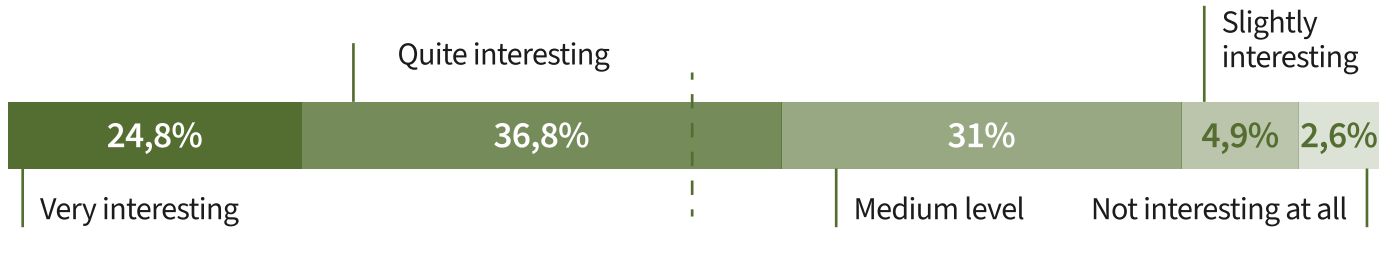
Guarantees	Percentage	Description
	29,4%	Want to know the commitment to safety these facilities have and their emergency plans .
	24,6%	Would like to receive clear and transparent information , especially those from Huelva who prioritise trust in information (26,3%).

Attitudes of Spaniards towards Spain's leadership in renewable energy development



INTEREST IN SPAIN'S ROLE

Unlike Spain overall, there is less rejection in Andalusia, with 5,3% of Spaniards finding it not interesting at all versus 2,6% of Andalusians.



AREAS IN SPAIN WHERE PROJECTS ARE BEING DEVELOPED

14,3% Among Andalusians **know** the areas where projects are being carried out.

Huelva It is the most spontaneously mentioned area (71,,2%), with **Andalusia** receiving 14,7% of mentions.

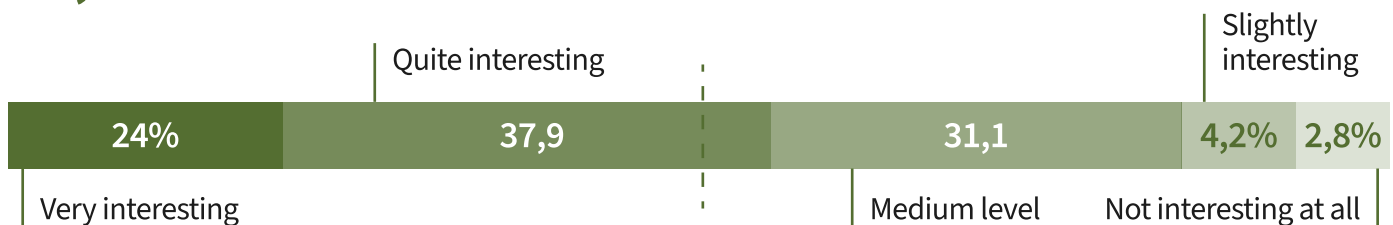
KNOWLEDGE ABOUT PROJECT FUNDING

88,7% Among Andalusians are **unaware** that the European

Huelva Shows **significantly greater knowledge** than the rest of Andalusia, rising to 33,3%.

INTEREST IN THE EUH2STARS PROJECT

61,9% Among Andalusians, the project is considered interesting (vs 59,1% in Spain).



Hombres

More favourable than women, as well as Boomers and Silvers

Seville

It is the province that shows the greatest interest

Conclusions on the study in Andalusia



The study conducted in **Andalusia confirms a pattern similar to that observed at the national level**; knowledge about renewable hydrogen remains limited among the general population, although it is slightly higher than the Spanish average.

When information about the **characteristics and applications of renewable hydrogen** is presented, the reaction is **predominantly positive**. The people of Andalusia clearly identify its benefits, particularly as a clean energy source, a solution for storing excess renewable energy, and a tool for reducing emissions. Furthermore, they show a high level of interest in its development, even above the national average.

Regarding **underground storage**, the perception is **equally favourable**. Citizens recognize key advantages such as the guarantee of energy supply, improved system stability, and reduced energy dependence. Additionally, there is significant support for such projects, coexisting with a substantial proportion of the population that remains neutral. Just like in the rest of Spain, the Andalusian population demands to know the safety measures of storage facilities and requests access to more information.

This positioning occurs in a **community particularly sensitive to environmental issues**, where a large majority express concern about environmental impact and are willing to make changes in their daily lives.

Consequently, Andalusia presents a particularly favourable context for the development of renewable hydrogen and its storage infrastructures. There exists a receptive social base that, with more information and guarantees, can solidify as active support.

In this scenario, the underground storage of renewable hydrogen is configured as an essential strategic element, as **without storage, there is no security of energy supply**.