HYINHEAT

HyInHeat Project: Hydrogen in energy intensive industry

A pragmatic path to decarbonisation

1. Introduction: HyInHeat and the Hydrogen Imperative

The HyInHeat project demonstrates the use of hydrogen in high-temperature industrial processes such as steel and aluminum production. These sectors account for a large share of Europe's CO_2 emissions and decarbonisation is essential for meeting EU climate neutrality targets. Heavy industry represents around 20% of EU CO_2 emissions. HyInHeat responds directly to the European Union's evolving hydrogen strategy, which has shifted from aspirational targets to pragmatic implementation.

HyInHeat has analysed the regulatory and market frameworks with regard to their effect on the use of H_2 in industrial processes and has launched a stakeholders consultation process with the aim of identifying potential policy gaps and obstacles that could create unfavourable conditions for the use of H_2 in industrial processes. To ensure the project outcomes reflect the needs and perspectives of all stakeholders, we invite you to participate in our survey. Your input will directly shape the future of hydrogen uptake in European industry.

EU Hydrogen Policy — HyInHeat — Industrial Use — Climate Goals

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2. Use of low carbon hydrogen as fuel

Hydrogen is one of the few viable pathways to decarbonize hard-to-abate sectors: Hydrogen combustion as the primary fuel in industrial thermal processes – such as furnaces and kilns in the steel and aluminium sectors – offers the potential for deep CO_2 emission reductions. Early studies indicate that replacing natural gas with hydrogen in high temperature processes could cut emissions by up to 90-95%. It enables the use of surplus renewable electricity and helps balance the grid while its early adoption positions EU industries as leaders in clean tech and strengthens resilience against future carbon costs.

Benefits of Hydrogen in Heavy Industry

Zero Emissions
Reduces CO_2 vs. fossil fuels

High Energy Density
Efficient energy per kg

Industrial Heat
Works in high-temp processes

Energy Storage
Buffers renewable energy

3. Challenges and Drawbacks

Despite its potential, hydrogen adoption faces significant hurdles. According to various techno-economic studies such as Agora Industry and EU Innovation Fund project statements, the economic challenge is clear: green hydrogen production costs range from €5 to €13 per kilogram—well above the target costs needed for reaching parity with conventional combustion fuels. Electricity market volatility and slow electrolyser cost reductions further undermine price stability. Though a large number of hydrogen infrastructure projects are expected to be developed and commissioned over the coming years, infrastructure is currently underdeveloped, with limited hydrogen pipelines, storage and retrofitting capacity in heavy industry, representing both technological and infrastructure barriers. Regulatory fragmentation across EU member states and lack of harmonised standards also delay project rollout.
From a technological maturity perspective, steelmaking is advancing rapidly with hydrogen combustion while aluminum applications remain at earlier stages of development. Additionally, social acceptance of hydrogen safety and the large-scale reshaping of industrial processes remain important considerations.

4. Take our survey

We analysed EU policy & market frameworks to understand how they support or block hydrogen use in industrial processes. We are now collecting stakeholder input to identify policy gaps and real-world barriers.

Your voice matters! Survey insights will be summarised into a final **Policy Recommendations Report** shared with EU and national decision-makers.

Take our survey