EPG

# Hydrogen:
# A Story of Strategic Autonomy

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At a time when reducing import dependence is taking centre stage, green hydrogen and hydrogen-based fuels are a large piece of the puzzle, as they play a key role in decoupling hard-to-abate sectors from fossil fuel dependence. By 2050, hydrogen is expected to be implemented at scale in long-distance transport and heavy industries, accounting for 80% of the final energy consumption in shipping and aviation, and used to produce 44% of the iron needed for steelmaking.

Hydrogen can contribute to the strategic autonomy of the European Union in several ways. First, it can do so directly by reducing reliance on imported fossil fuels and thus strengthening the region's energy security. Second, the industries that will be its main consumers have strategic importance, as for instance steel contributes to the defence sector, while ammonia safeguards food security through its use in fertiliser production. Enabling their adoption of hydrogen comes as a support measure, as they gain access to a flexible and secure energy source which also lowers their carbon-related bills, since the free allocations within the Emissions Trading System are soon to be phased out. At the same time, hydrogen contributes to tackling climate change through decarbonisation, as heavy industries and long-distance transport are major sources of global greenhouse gas emissions. Inaction or delayed action in this regard can become a national security threat in the face of the potential future natural disasters and extreme weather events.

What is currently missing, however, is a market and some degree of certainty that there will be willingness to pay for green hydrogen, given its price premium and the current lack of infrastructure. A way to unlock demand and ensure a real commitment of stakeholders is through ensuring a time-efficient build-out of infrastructure and lowering the price premium. The electricity price is the main driver of this premium, as electrolysis (i.e. the process of producing hydrogen from splitting the water molecule) is energy-intensive and requires a clean energy source for hydrogen to be labelled as green. In the EU, some regions such as Scandinavia and the Iberian Peninsula have advantages in this regard, the former especially through its abundant hydropower and the latter through a mix of electricity market design and high renewable output, thus enabling lower electricity prices.

However, the electricity prices across the EU are heterogenous, meaning not all regions can benefit from this level of affordability. In this instance, lowering the electrolysis costs could

be achieved to some extent through energy efficiency. Investing more in research and development can support new technological solutions that enable electrolysers to become cheaper to purchase and more energy efficient, consume less electricity and have a longer stack durability. In addition, committing funds to other measures such as investments in renewable energy infrastructure, grid modernisation and energy storage would also indirectly facilitate the scale-up of hydrogen, provided these measures achieve lower electricity costs.

Decreasing the costs could be complemented by more ambitious targets at state-level, for instance when transposing the Renewable Energy Directive (RED III) into law. While RED III requires a minimum of 1% of all transport fuel to be renewable fuel of non-biological origin by 2030, the Member States could go above that level and require a more ambitious target to accelerate hydrogen-related progress and provide more certainty about future end-users.

Developing hydrogen supply chains is a long-term and complex process that requires sustained commitment and clarity of purpose. Progress remains uneven across the EU, often hindered by fragmented policies and a lack of coherent investment signals. To accelerate deployment, stronger and more targeted commitments are needed within national energy and industrial strategies. Clearer objectives, robust implementation frameworks, and cross-sectoral alignment are essential to move beyond pilots and announcements towards scalable and resilient ecosystems that serve both economic and security interests.

Given the increased attention of EU Member States towards defence, and the increased funding allocated for that sector, now is the time to think strategically about the long-term role of hydrogen in this regard. This is a story of self-sufficiency, a story of energy security and strategic autonomy, which could therefore be included in defence spending as a national security-related investment.