

Argus White Paper: Industrial RFNBO targets imperil European fertilizer self-sufficiency



Following confirmation of the EU's industrial renewable fuel of non-biological origin (RFNBO) targets in the revised Renewable Energy Directive (RED III), Argus analyses the impact on individual countries, given the mix of hydrogen uses and their options for decarbonisation, focusing on ammonia and fertilizer producers

Adoption of RED III targets for RFNBO use in industry

The EU's Council of Ministers on 9 October adopted the final legal texts of RED III, which:

- Increases the bloc's current target for the share of renewables in final energy consumption;
- Sets a sub-target share of renewables in final consumption of energy in transport;
- Establishes minimum shares for the use of sustainable aviation fuels;
- Establishes RFNBO targets in industry — member states will now ensure that RFNBOs used for final energy and non-energy purposes constitute at least 42pc of the hydrogen used for final energy and non-energy purposes in industry by 2030, and 60pc by 2035.

In non-binding statements attached to the legal texts, some central European countries as well as Belgium and Ireland signalled discontent at the high level of the new targets. The use of qualified majority voting, and not unanimity, to approve RED III and other legislation, constitutes a “dangerous precedent”, according to the Polish government. Warsaw added that the entire package of legal measures — which are aimed at reducing greenhouse gas (GHG) emissions by 55pc by 2030 compared with 1990 levels — sets “unrealistic targets and ambitions and significantly impacts member states' energy mixes”.

Following formal adoption in the official journal on October 31, member states have until the end of April 2025 to transpose the rules into national law.

In the absence of concrete details around how EU goals will translate into member states' specific targets, we have assumed that the EU-wide target applies to each individual member state, which can then decide how best to proceed given the characteristics and motivations of that country.

Essentially, EU member states have three strategies at their disposal — which are not mutually exclusive — to achieve their industrial RFNBO targets:

- Strategy #1 Decarbonise existing grey hydrogen production
- Strategy #2 Shutter existing grey production or reduce utilisation rates and import merchant clean ammonia, where logistics allow
- Strategy #3: Find new zero carbon use cases (e.g. steel)

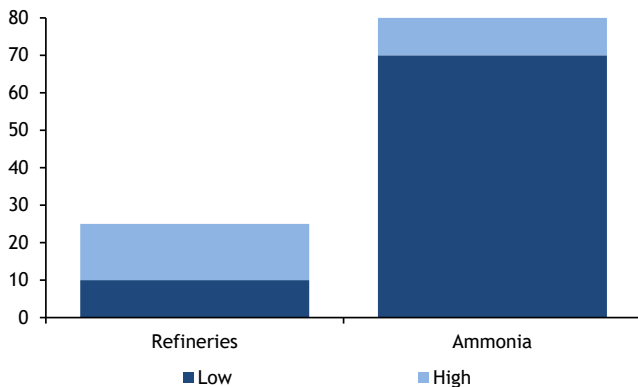
Focus on decarbonising oil refineries

The EU consumes more than 7mn t/yr of hydrogen, with oil refineries and ammonia production — for use in fertilizer and industrial applications — the largest users, and methanol contributing a small share. But the new RED III targets now require the EU to decarbonise 1-2 mn t/yr of the hydrogen that it consumes.

In deciding how best to translate EU targets into national law, member states will be motivated by two primary considerations:

1. Price sensitivity of finished products to cost of hydrogen
2. Strategic/political significance of end market

Hydrogen production, % of cash costs by end user



By these metrics, we expect policy makers to decarbonise, oil refineries and industrial-use ammonia first, and only decarbonise ammonia used for fertilizers if necessary. Ammonia for fertilizers has by far the highest sensitivity to the cost of hydrogen and — for field crops — nitrogen fertilizer produced from ammonia is a large share of production costs. As a result, higher ammonia costs would directly impact the cost of nitrogen-hungry crops such as wheat, in turn driving up the price of food staples. Alternatively, reducing marginal agricultural land would cut nitrogen consumption and help achieve legacy targets from the EU’s 2020 Farm To Fork strategy, namely a 20pc reduction in nitrogen consumption, which was intended to be a function of a 50pc reduction in nutrient losses when applied to the field.

The implication is that demand for ammonia as a hydrogen carrier will be almost as important as ammonia as a finished product for fertilizer decarbonisation. Ammonia will compete with other established and novel carrier technologies but is expected to be the dominant vector over the long term.

Ammonia production faces greatest pressure from RED III

In 2030 the majority of aggregate EU hydrogen demand can be met through refinery decarbonisation, but most countries will face pressure to decarbonise their ammonia production, particularly Poland, Lithuania, Hungary, Slovakia, Austria and Croatia. Unfortunately, decarbonising ammonia production will be challenging, given scarce access to renewables. Coastally located nitrogen fertilizer plants — such as in Lithuania — could adapt to the new environment by shuttering ammonia production but keeping downstream production — mostly nitrate fertilizers — based on imported clean ammonia (Strategy #2). Inland plants, logistically remote from accessing imports, would be unable to import clean ammonia as competitively.

By 2035 the trend is more exaggerated, due to higher RFNBO targets, which places greater pressure on ammonia to decarbonise. Germany and France would face pressure to decarbonise ammonia production, but the small volumes

relative to their industrial base as well as lofty ambitions for industrial decarbonisation — particularly for Germany, where 2030 clean H₂ targets for steel are 6-7 times higher than for chemicals — should allow these countries to find alternatives to achieve the overall industrial target (Strategy #3). The Netherlands, Belgium and Bulgaria will also face pressure on ammonia assets, but OCI Geleen and Yara Sluiskil could be expected to adjust their sourcing strategy, particularly under a high gas price scenario (Strategy #2). The same would be true of Agropolychim, which is positioning itself as a potential importer of low-carbon ammonia in the Black Sea, having built a new ammonia terminal in 2022 and planning another within the next three years. The company in May announced plans to double its nitrate fertilizer capacity to 1.5mn t/yr.

But central European producers face the stark reality of the majority of their existing ammonia capacity requiring decarbonisation by 2035. We estimate that around 5mn t/yr of nitrate fertilizer capacity is at high risk of closure (Strategy #1)

Political challenges of decarbonisation

The EU emissions trading system (ETS) was introduced to force emitters to pay for their carbon footprint, cushioned in the early years by free allowances. As free allowances are withdrawn from 2026, a carbon border adjustment mechanism will be introduced to level the carbon playing field with imports of ammonia from other regions without a carbon tax. The EU’s intention is to avoid offshoring emissions to countries with higher carbon footprints and, implicitly, to avoid unfairly prejudicing European producers.

For certain fertilizer producers, rebalancing a plant to import clean ammonia could have little impact on margins where costs can be passed on, but inland plants would be unfairly compromised by this legislation and for little gain. Fertilizers are essential for maintaining high crop yields and consumption is forecast to remain relatively stable, despite the effect of Farm To Fork targets. Without significant investment in new nitrates capacity targeted at the European market, there will inevitably be a greater reliance on urea, which implies a potentially higher environmental footprint, not least owing to lower efficiencies caused by volatilisation of CO₂ when applied to the field. Further down the line, growers could import finished green fertilizers — produced from clean ammonia — to meet this shortfall, but substituting domestic production for imports would fall foul of the Net-Zero Industry Act’s stated intention to “improve the EU’s energy resilience”.

Member states must also consider the political implications of their decisions. Ahead of elections on 15 October, Poland’s Law and Justice party attempted to rally support by accusing opposition leader Donald Tusk of selling the country out to Germany, which is heavily associated with determining the direction of EU policy. The divisive rhetoric of the campaign

highlighted for member states the political risks and ramifications of the potential damage to domestic industry that could result from measures such as implementing the industrial RFNBO target.

Fertilizers Europe has defended the role of the EU fertilizer industry stating: “If no ammonia is produced in Europe, we risk substituting one dependency with another, having serious repercussions on food security and strategic autonomy.”

CCS: Only a partial solution

The obvious conclusion of this analysis is that blue hydrogen must play a significant role for those inland fertilizer producers. There is currently no delegated act for blue hydrogen but “a methodology for assessing greenhouse gas emissions savings from low-carbon fuels will be set out in delegated legislation by 31 December 2024”, according to the EU Delegated Act on Renewable Hydrogen. For its part, Fertilizers Europe “fully supports that the net zero act recognises carbon capture and storage as a strategic net zero technology [which] will surely go some way to levelling the geographic disparities on access to renewable energy.” Many regional EU plants lack access to geological resources or CO₂ pipelines for sequestration and transportation, but others may find opportunities to retrofit their plants with carbon capture to reduce their footprint and prolong the life of the plant. The challenge arises over how to define RFNBOs.

The EU’s Delegated Act on renewable hydrogen from February 2023 stated that “RFNBOs will only be counted towards the EU’s renewable energy target if they have more than 70pc greenhouse gas emissions savings compared with fossil

fuels”, a threshold above the estimated 50-60pc reduction that would be achieved by retrofitting existing units. Nonetheless, it would be perverse to exclude retrofits from the solution when the alternative is the shuttering of large swathes of fertilizer capacity, essential to regional food security. National governments are designing incentives for blue hydrogen and ammonia, such as the Carbon Contracts for Difference scheme in Germany, which provides a subsidy for conversion to lower emission technologies. An EU-wide system based on net emissions reductions — anchored in GHG intensity rather than arbitrary classification of RFNBOs or colours — would support this essential endeavour, as would the inclusion of carbon capture and utilisation into the ETS, which is currently under consideration.

Conclusion: Exemptions for ammonia?

The confirmation of RED III targets will be the first time that clear demand signals are created for clean ammonia, spurring around 10 mn t/yr of demand by the early 2030s and resolving the seemingly intractable “chicken and egg” dilemma that is holding back final investment decisions on projects. But oriented around production indicators — such as hydrogen consumption — RED III runs the risk of creating an unfair playing field, driving plant closures in Europe and displacing regional production, which in turn will make imports such as ammonia for fertilizers vital for ensuring food — and energy — security in some areas. Early leaks of the legislation appeared to offer concessions to ammonia producers, but these did not materialise in the final draft. We would expect some flexibility to be provided for countries that have limited economic opportunities for decarbonisation. To square the circle of policy conflict, maybe exemptions will have to be made.

For more information:

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The Argus Ammonia price reporting service provides accurate and reliable daily and weekly price assessments, alongside news and market commentary direct from our expert global editorial team. Includes the underlying data in Excel.

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Ammonia derivatives based on Argus prices

Argus ammonia prices are being used by exchanges for ammonia derivatives contracts, allowing companies to hedge against price volatility as the energy transition increasingly fuels growth in the industry.

- Intercontinental Exchange (ICE) launched a new ammonia derivatives contract on 16 January 2023, based on the daily Argus ammonia northwest Europe cfr duty free/paid price | [Read more here](#)
- Singapore Exchange (SGX) launched new ammonia derivatives contracts on 2 October 2023, based on the Argus ammonia cfr east Asia index and the Argus ammonia fob Middle East index | [Read more here](#)



Clean ammonia: Long-term cost and price modelling

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