Brought to you by Argus Media

Vol 42 • Issue 1 – January/February 2025

Fertilizer Focus

Fertilizer's opportunity for decarbonisation

- New facilities
- Digital soil maps
- Africa focus

CONTENTS

argus
argusmedia.com

Fertilizer Focus
Argus Media group
Lacon House, 84 Theobalds Road,
London, WC1X 8NL

Email: fertilizer@argusmedia.com
www.argusmedia.com/fertilizer

Bringing down carbon emissions

Written by
Stef Worsley, *Editor, Fertilizer Focus Magazine,*
Argus Media, UK

Happy New Year! Welcome to the January/February edition of Fertilizer Focus! In this issue, Michael Freeman continues his series on the on the history of modern fertilizers. He takes a look at the rise in fertilizer demand in the 1970s. Half of the increase in fertilizer use during the 1970s occurred in developing regions, primarily in Asian countries, but also in Latin America, where Brazil began using more fertilizers to support its expanding agricultural sector. At the same time, fertilizer use was increasing in the USSR.

The main feature article in this edition is from Mission Possible Partnership and focuses on the decarbonisation of the fertilizer industry. With so much at stake, the fertilizer sector has a unique opportunity to become a global leader in climate action and a catalyst for bringing down carbon emissions across multiple industries.

Meanwhile, Topsoe discusses the development of various alternative formulations and technological approaches for ammonia synthesis catalysts.

We have a special focus section on "Infrastructure and logistics", with a particular emphasis on new facilities. Firstly, Genesis Fertilizers, presents Canada's first low-carbon nitrogen fertilizer facility. The multi-billion-dollar project is designed to stabilize supply, lower net operational costs for farmers, and reduce the carbon footprint of fertilizer production.

Nutrien Ag Solutions also confirms a AUD70 million fertilizer centre for Western Australia. Western Australian premier, Roger Cook, says that the new facility is a big vote of confidence in the long-term future of the State's agriculture sector and the State's role as a key agricultural hub for food production and exports.

We also feature an engaging interview with Roberta Reeve, Technical Manager at the Agricultural Industries Confederation (AIC) about the Fertiliser Industry Assurance Scheme (FIAS). The key aims of which are to manage the security, safety and traceability of fertilizers within the UK supply chain, from the arrival of fertilizer materials at UK ports, right up to delivery to the user farms.

The supplement in this edition is on the African industry. Marie Claire Kalihangabo from the African Development Bank discusses The Africa Fertilizer Financing Mechanism. This has encouraged suppliers and agro-dealers to sign agribusiness partnership contracts, paving the way to stronger relationships throughout the agricultural value chain.

Barbra Sehlule Mazata from the CGIAR Excellence in Agronomy Initiative then looks at the new digital soil maps available for Africa, which are helping to unlock agronomy solutions for farmers in West Africa and the Sahel.

There is also preview for the Argus Clean Ammonia India, Middle East and Africa 2025 conference which gives a great insight into the upcoming event on 3 February. With industry-leading speakers, topics covered will include regional highlights on critical issues including strategy and policy frameworks, financing projects, carbon capture and management as well as consumer perspectives and updates on key demand-side policies from the EU, South Korea and Japan.

Please also take time to peruse the new 2025 Media Pack and consider the advertising opportunities in the magazine – we are now reaching over 15,000 readers per edition!

I hope you enjoy the issue. ■

History of the modern mineral fertilizer industry
Volume 3: 1950-2000 (Part 3)

The rise in demand in the 1970s

This is the third and final volume of the history of the modern mineral fertilizer industry by Michael Freeman, which takes a look at the evolution of fertilizers over the past two centuries (Please refer to all editions of Fertilizer Focus in 2022 for volume 1 and editions in 2023/24 for volume 2).

In the three decades before 1980, the annual demand for mineral fertilizer nutrients doubled every ten years, climbing from 14 mn t in 1950 to 116 mn t in 1980. The 48 mn t increment in the 1970s was the highest recorded up to that time for a ten-year period and has not been exceeded since then. Half of the increase in fertilizer use during the 1970s occurred in developing regions, primarily in Asian countries, but also in Latin America, where Brazil began using more fertilizers to support its expanding agricultural sector. At the same time, fertilizer use was increasing in the USSR. The pattern of nutrient demand shifted, with greater emphasis placed on nitrogen, especially in Asian countries. By 1980, global nitrogen (N) consumption had doubled compared to P_2O_5 consumption.

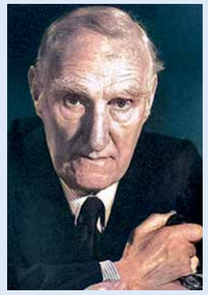
The strong demand for fertilizers in the early 1970s - marked by an annual growth rate of 6-8% between 1970 and 1973 - coincided with a recovery in international commodity fertilizer prices. In 1973, Arab oil exporters announced a four-fold increase in oil prices, from USD4 to USD12 per barrel, claiming it was necessary to preserve the value of their product. This move triggered significant price hikes for other commodities, as exporters followed the oil producers lead. Among them, OCP, the world's largest phosphate rock exporter, imposed a four-fold price increase for 1974 deliveries.

Expansion was facilitated by the surge in the industry's profitability

Since oil-related materials and phosphate rock are key inputs for nitrogen and phosphate fertilizer production, it was no surprise that their prices also surged, reaching record highs of around USD300/t in 1974. Prices then declined but were boosted again during the 1980–81 price surge, when nitrogen and phosphate fertilizer prices peaked at approximately USD200/t. These two "price shocks" drove the nominal prices of urea and concentrated phosphates to levels three times higher than those at the end of the 1960s.

The export price of MOP, the primary potash fertilizer, did not respond directly to the price shocks but rose steadily. By 1980, it was also four times its pre-1970 level.

Boyd-Orr, Lord John (1880-1971)



John Boyd-Orr, the son of a Scots quarry owner, was educated at Glasgow University, from which he emerged with degrees in medicine and in biological sciences. This led to a career in the science of nutrition in his native country. In 1913, he was appointed director of the new Rowlett Institute in Aberdeen and, after serving in WWI, he went on to develop the institute to become a major centre for scientific research into food and nutrition. At the end of WWII, at the age of 65, he was elected to become the first director of the newly-formed Food and Agriculture Organization (FAO) of the United Nations, and his immediate responsibility was to develop resources to alleviate famine in the immediate post-war period. He wanted to build on the FAO's success to establish a World Food Plan, but this proposal was resisted by the British and US delegations. After four years at the helm of the FAO, Lord Boyd-Orr retired in 1948 and in the following year he was awarded the Nobel Peace Prize for his work on nutrition science and his role in establishing the FAO.

Production expansion

Consumption data clearly shows that the two waves of price increases significantly affected demand for phosphates and potash, leading to declines in 1974 and again in 1981–82, particularly in North America and Europe. Consumption levels for P_2O_5 and K_2O peaked during the 1970s, while demand for nitrogen continued to grow. Fertilizer use in the Communist-controlled economies of Central Europe and the USSR generally increased until the late 1980s. However, the expansion of fertilizer consumption in developing regions more than offset any declines elsewhere, resulting in global fertilizer use continuing to grow after the 1970s, ultimately reaching an all-time high in 2020.

To sustain the increased demand for nutrients, particularly nitrogen, significant expansion of fertilizer production was required. This expansion was facilitated by the surge in the industry's profitability. Ammonia/urea production facilities were established both in consuming countries and in regions with access to cheap natural gas, which could be converted into ammonia and urea for export.

One example of domestic capacity building was China, which had limited success in developing its own modern nitrogen fertilizer technology. In 1973, China signed contracts with Kellogg for eight 1000 t/day ammonia plants and with Stamicarbon for urea plants, to be constructed at multiple locations across the country. In contrast, the USSR focused on export capacity. Dr. Armand Hammer, President of Occidental Petroleum, facilitated a twenty-year agreement signed in April 1973. Under this deal, Occidental was to supply 1 mn t per year of superphosphoric acid (SPA) from its Florida complex to support the production of NP liquid fertilizers in the USSR. Revenue would be generated through the export of ammonia and urea produced in newly built facilities using Western technology, located at various sites in the USSR, including Togliatti, Gorlovka, and the Black Sea port of Odessa (Yuzhnyy).

The agreement also included the construction of a 2,500 km ammonia pipeline to transport the product to the Yuzhnyy export terminal, with railcars supplying the Baltic port of Ventspils. Urea was also transported by rail to these ports. Exports began in 1978, establishing the USSR as a significant supplier of nitrogen in international markets.

Although the Occidental deal initially included plans for a 1 mn t/y potash mine in Soviet Central Asia, this project was never realized. While SPA deliveries commenced, they gradually declined due to limited interest from the Soviet side.

Reserves and resources

The growth in the global supply of potash fertilizers was driven by the exploitation of vast deposits in Saskatchewan, western Canada, and

The Lousal VHMS mine in Portgual worked continuously between 1900 and 1988, exploiting pyrite as a sulphur source for fertilizer production

the USSR. Early efforts to develop the Saskatchewan deposits were hindered by technical challenges, but these issues were resolved, and continuous production began in the early 1960s. Over the next decade, ten mines were commissioned, adding 7 mn t per year to global capacity and leading to an oversupply. To address this, the Government of Saskatchewan implemented a production allocation and floor price scheme, reminiscent of the German industry's efforts to control capacity in the late 1870s. However, the expected closure of uneconomic potash mines in Europe did not occur, forcing the new Saskatchewan producers to operate at low utilization rates. This made them susceptible to buy-out offers from the Saskatchewan government, which acquired five of the new mines and established the Potash Corporation of Saskatchewan (PotashCorp), a state-owned enterprise, to manage them.

The growth in the global supply of potash fertilizers was driven by the exploitation of vast deposits

In subsequent decades, PotashCorp was privatized and adopted an aggressive acquisition strategy, transforming it into one of North America's largest fertilizer producers and a major global industry player.

The expansion of fertilizer production also reignited concerns about the adequacy of raw material reserves and resources. A 1972 paper published by the Institute of Ecology claimed that known phosphorus supplies would be depleted by the end of the 21st century. However, phosphate industry experts rebutted this assertion. While phosphorus is the 11th most abundant chemical element in the environment, publicly available information on reserves - and especially resources - is insufficient to make precise predictions about their longevity. ■

From agriculture to shipping:

Fertilizer's opportunity to sow the seeds of decarbonisation

Written by

Rachel Howard, *Director of Industrial Decarbonisation,* ***Mission Possible Partnership, USA***

Agriculture is the cornerstone of our global society, producing much of the food we eat and providing a livelihood to millions of people in countries spanning every continent. It goes without saying that fertilizer is essential for producing the quality and yield of crops farmers expect and rely on to feed a growing global population. But mineral based fertilizers also contribute to global greenhouse gas emissions, and with demand rising, an estimated additional 44 mn t will be required by 2050, so fertilizers are increasingly contributing to the climate crisis.

Extreme weather events due to rising temperatures are becoming increasingly common with record levels of rainfall leading to recent flooding across Europe and Pakistan and persistent droughts and wildfires in regions such as California and the Horn of Africa. Food security and the viability of agricultural communities around the world are under threat. With so much at stake, the fertilizer sector has a unique opportunity to become a global leader in climate action and a catalyst for bringing down carbon emissions across multiple industries.

Ammonia is the starting point for all nitrogen-based fertilizers with between 70-85% of global ammonia production going into fertilizers, which researchers estimate moves on to produce roughly half of the world's food supply. Currently, ammonia production accounts for approximately 1% of global greenhouse gas (GHG) emissions, making it the largest single source of emissions in the chemical industry. Conventional or 'grey' ammonia is produced using fossil fuel derived hydrogen and then further processed to create either ammonium nitrate or urea from which different fertilizer types are manufactured.

Green ammonia, produced using renewable energy and green hydrogen, offers a path to drastically reduce emissions from fertilizers and could have a positive knock-on effect on the decarbonisation of other hydrogen-dependent sectors through driving a rapid scale-up of green hydrogen production. Current costs for green ammonia are greater at USD860-1,100/t than the carbon-intensive grey equivalent.

(left) Beyond agricultural uses green ammonia has the potential to create a domino effect in other areas reliant on hydrogen for decarbonisation such as low-carbon shipping fuel

Green ammonia as a priority

One of the key benefits of renewable ammonia compared with green technologies for other high emission sectors is its ease of use. Low carbon ammonia is a drop-in solution to the fertilizer manufacturing process, so no changes or new infrastructure are needed. Although currently coming with a cost premium, it is closer to price parity than other sectors at USD2.20/kg versus approximately USD600/t of fossil-based fertilizer production and can be blended with grey ammonia to enable a progressive ramp-up of use and limit cost impacts.

Ammonia, together with the six other heavy industry and transport sectors, represent 30% of global emissions which are considered some of the most challenging sectors to decarbonise. Mission Possible Partnership tracks these seven industries for progress worldwide against industry-backed 2030 decarbonisation goals. At the time of writing, the ammonia sector is out-performing others. The pipeline of announced low-carbon ammonia plants far outweighs the goal of 60 operational green and blue ammonia plants by 2030 for near-zero production to be achieved. 169 commercial scale ammonia projects have been announced but are still waiting to pass the critical final investment decision stage. Globally, five are in operation and 18 have financing agreed, leaving another 37 needing finance within the next two years to have a chance of being up and running by 2030.

Beyond agricultural uses green ammonia has the potential to create a domino effect in other areas reliant on hydrogen for decarbonisation such as low-carbon shipping fuel, green steel and sustainable aviation fuel. By creating a foothold demand for green ammonia for fertilizers, the sector can help boost production and enable economies of scale for green hydrogen. This will result in declining technology expense and cost reduction benefits which could trigger a cascade of tipping points in other sectors for green products.

Accelerating the green fertilizer market with Green Market Makers

History shows that all new markets follow an 'S' curve from a slow start as niche products to the point where demand suddenly rises – the tipping point - where exponential growth takes hold and prices come down. Despite its transformative potential and strong pipeline of planned projects, the commercial production of green ammonia for fertilizers currently faces some critical challenges which are slowing down investment in the sector. These challenges include a lack of demand at the current price point, a misalignment of policies across different geographies and availability of clean energy. Targeted interventions are needed to accelerate the green ammonia market to make more clean fertilizers.

Green Market Makers (GMMs) are one of these targeted interventions

Green Market Makers (GMMs) are one of these targeted interventions and are emerging as game-changers, capable of catapulting early markets like green ammonia for fertilizer production. A GMM is an innovative model for buying and selling low-carbon commodities, stepping in as an intermediary between low-carbon producers and purchasers. They are exceptionally powerful since they can buy low-carbon products at an acceptable price for the producer but also sell to the purchaser at a cost they are willing to pay, bridging the difference, this can foster confidence and absorb risk, two factors commonly blocking initial market growth.

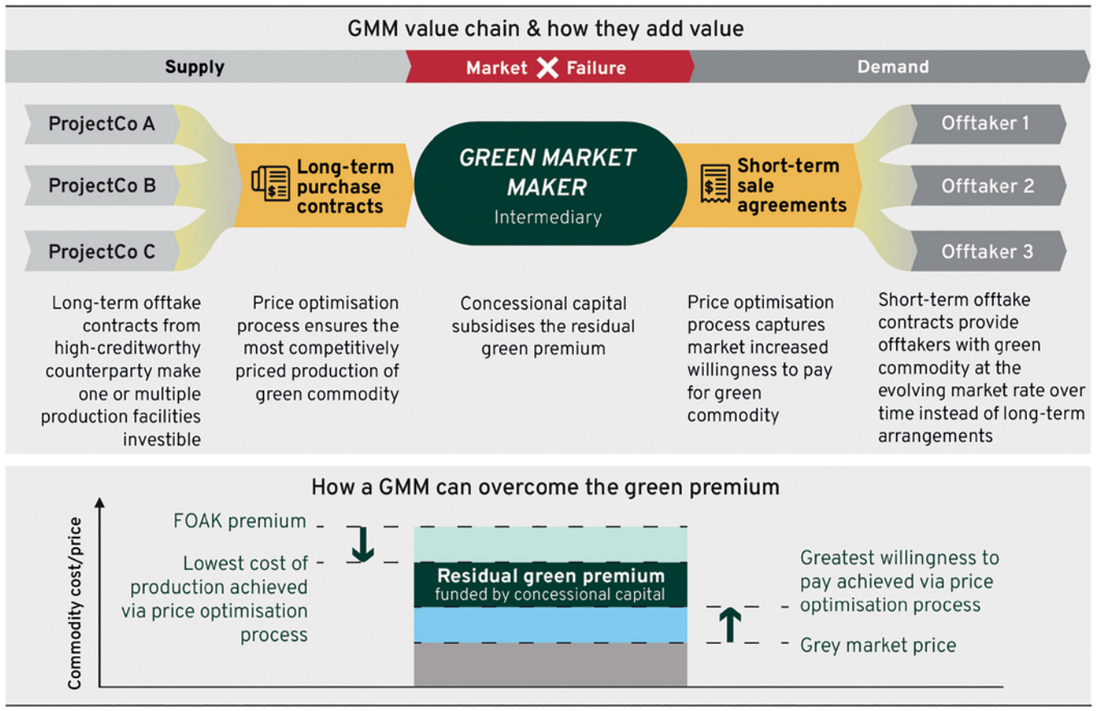
Lessons from early adopters, H2Global, a proven Green Market Maker

H2Global is pioneering the GMM model. Launched by the German government, it has already completed a double-sided auction to optimise prices, enable price discovery, provide liquidity and absorb risks.

In July 2024 it successfully contracted Fertiglobe to supply 397,000 t of green ammonia to Europe from Egypt between 2027 and 2033 via the Port of Rotterdam at EUR1000/t of ammonia with a net production price of EUR810/t. This could indirectly support fertilizer manufacturing.

H2Global has already secured partnerships for future auctions, backed by funding commitments totalling USD6 billion from Australia, Canada, further German funds and the Netherlands, highlighting how the GMM model can unlock investment.

Figure 1. How a Green Market Maker operates



State-backed intermediaries – also known as Green Market Makers (GMM) – could be a game changing instrument to scale up first green fertilizer transactions.

Emerging markets are seizing the opportunity and showing regional leadership

The Industrial Transition Accelerator (ITA), a global multi-sector initiative hosted by Mission Possible Partnership (MPP), is partnering with the Brazilian government in a different example, highlighting how policy can advance green ammonia production. ITA's partnership with Brazil addresses the country's heavy dependence on imported fertilizers, which currently make up 85% of its supply, making it the world's largest importer. This reliance leaves Brazil vulnerable to supply chain disruptions and limits its ability to achieve agricultural sustainability.

The Brazilian government has demonstrated great leadership

The partnership between the ITA and the Brazilian government focuses on scaling green ammonia production to meet domestic fertilizer demand. At the heart of this initiative is Atlas Agro, whose Uberaba Green Fertilizer (UGF) project was selected by the ITA as one of its flagship projects in the country and hopes to become Brazil's first commercial-scale green nitrogen fertilizer plant. The plans for the new plant include being built close to farmers to reduce transportation costs. Engineering studies are in progress and the project is actively moving towards a final investment decision. While UGF represents the only dedicated large-scale green fertilizer project identified to date in the country, 13 additional green ammonia projects have been identified in Brazil, which could supply and open up more green fertilizer manufacturing opportunities.

The Brazilian government has demonstrated great leadership with its Nova Indústria Brasil plan, bioeconomy and clean hydrogen initiatives. On the other side of the world, in India, another big importer of fertilizer, the Solar Energy Corporation of India has called for tenders to produce 540,000 t of green ammonia per year and will act as an intermediary procurer for 10 years.

Low carbon ammonia is a drop-in solution to the fertilizer manufacturing process, so no changes or new infrastructure are needed

Nothing revolutionary is ever easy

Clean ammonia production is a critical priority to move to low-carbon fertilizer and can unlock wider industry decarbonisation. It is a straightforward switch and should be something governments around the world prioritise, but it is not easy to change a whole sector, let alone a sector that helps to feed the world.

Research shows certain government policies could be very effective in encouraging a move to cleaner fertilizer production with minimal impact on the wider sector, for example, mandates starting at 1% of green ammonia in fertilizers, which would add less than 0.001% to end food prices. This could be increased over time as the price of green ammonia comes down. The fertilizer value chain, although subject to regional variations, does have the ability to cascade the 'green premium', resulting in negligible impacts on consumer food and drinks prices.

Clean ammonia production is a critical priority to move to low-carbon fertilizer

Fairtrade and organic products are already well established in developed markets and sell with premiums of between 10-100%. Importantly, essential food products could be shielded from price increases.

If more intermediaries such as H2Global exist, they could absorb price differences and ensure that suppliers benefit from 10-year (or longer) contracts while farmers continue with short-term purchasing practices. More projects in countries such as Brazil and India, where it will be cheaper to produce green ammonia will make a difference. Both countries have announced five low-carbon ammonia projects each which are still waiting on a final investment decision. By aligning policy frameworks with industry needs, governments can unlock the potential of green ammonia to drive agricultural decarbonisation.

Farmers are among the first victims of climate change, the fertilizer industry is at a pivotal moment, it can take a proactive role in transitioning to a green industry which will be good for the farmers in the long-term and help with decarbonising other sectors in the supply chain like shipping and aviation or it can stand by and wait for the inevitable. This is the moment for the fertilizer industry to be pioneers of green innovation.

None of this is easy, but through investing in innovation, building alliances, collaboration and coordinated action from industry and governments in partnership, the vision of a decarbonised agriculture sector can become a reality. ■

Optimization of time-proven catalyst boosts conversion and efficiency

Written by

Mads Feddersen, *Senior Product Line Director, Clean Fuels & Chemicals - Catalyst.* ***Topsoe, Denmark***

The Haber-Bosch process revolutionized ammonia production by introducing promoted magnetite catalysts. Despite numerous alternatives, magnetite continues to dominate due to continuous advancements in optimizing iron crystal morphology and promoter dispersion, resulting in the most active magnetite catalyst ever developed.

Magnetite-based solutions offer exceptional longevity, with service lives so extensive that selecting a catalyst is often a once-in-a-career decision. The robustness of the catalyst is even more important when producing green ammonia as these plants will operate at fluctuating conditions depending on the electricity availability.

The catalyst chosen will significantly impact the plant's operating economics, lasting 15-20 years before replacement is needed. A poor choice can have costly consequences, however, because replacing a catalyst involves significant downtime and lost production.

The margins matter

The Haber-Bosch process is widely regarded as one of the most transformative industrial chemistry innovations, making ammonia fertilizer readily available and fuelling dramatic increases in agricultural yields. Beyond agriculture, ammonia has become a key ingredient in pharmaceuticals, plastics, textiles, and countless other chemicals. Even minor enhancements in this mature technology can have outsized impacts, underscoring the importance of operating margins in determining both profitability and market share.

Global ammonia demand is projected to rise to 470 mn t

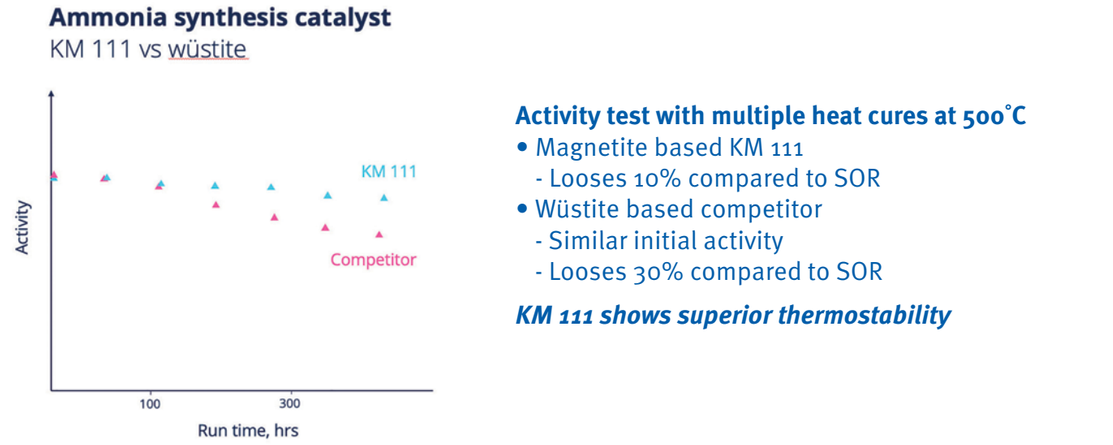
Under the Net Zero Emissions by 2050 scenario, global ammonia demand is projected to rise to 470 mn t, driven by slight increases in fertilizer use, and a 29.5% growth in industrial applications. However, the most significant demand surge will likely come from new applications, particularly ammonia's use as a marine fuel, which could account for 43% of direct ammonia use by 2050. Additionally, ammonia's role as a hydrogen carrier is set to grow due to its high energy density, ease of transport, and existing infrastructure, making it vital for the energy transition.

Developments and parameters

The development of various alternative formulations and technological approaches for ammonia synthesis catalysts has been a constant over the years. About 25 years ago, a catalyst featuring ruthenium on a carbon carrier system, combined with a unique process design, generated significant buzz. However, only a few installations were ever realized due to challenges such as methanation side-reactions and the catalyst's high sensitivity to poisoning. Additionally, the scarcity of ruthenium and the complexity of the production process resulted in prohibitively high costs, rendering the process commercially unviable.

In 2005, a new iron catalyst, based on a promoted wustite phase, was introduced commercially, driven by a Chinese development initiative. This catalyst has since gained some market share in China. To evaluate the characteristics and advantages of magnetite-based versus wustite-based catalysts, it is essential to understand

Figure 1. Ageing experiments of commercially available magnetite and wustite based ammonia synthesis catalysts



the key features that contribute to a long-lasting ammonia synthesis catalyst, including:

- High and stable activity
- Low deactivation rate
- Effective stabilization of pre-reduced versions

Activity and balance

Achieving high catalyst activity requires not only the optimal amount and distribution of promoters on the iron surface but also a substantial presence of highly active Fe(111) sites. These sites, characterized by an open iron surface, allow easier access for gas reactants, thereby offering significantly higher ammonia synthesis activity compared to the more closed structures of Fe(100) and Fe(110) sites. Magnetite itself does not inherently favour any of these sites, so their formation is a factor that can be controlled and optimized during catalyst fabrication by selecting the appropriate manufacturing conditions.

While suitable promoters can partially compensate for the absence of Fe(111) sites, they can never fully achieve the same level of activity.

The Importance of promoter distribution

The use of structural promoters such as Al, Ca, Si, and Mg is crucial in reducing the sintering of active iron sites during operation, which in turn lowers deactivation rates and maintains stable production rates in industrial units. However, to achieve optimal promotion effects, these promoters must be evenly distributed across the iron surface. On magnetite catalysts, this uniform distribution can be achieved through the appropriate techniques during catalyst fabrication.

Researchers highlight the challenges of achieving even promoter distribution on wustite-based catalysts, which often leads to higher deactivation rates. To explore this issue further, the Topsoe Research & Development department conducted aging experiments on both magnetite and wustite-based catalysts. The experiments, conducted at 500°C with a gas composition reflecting typical industrial conditions (a hydrogen/nitrogen ratio of 3) and at pressures of 20 MPa, revealed the impact on deactivation rates.

Accelerated aging tests reveal that magnetite-based materials lose only 10% of their activity, while wustite-based materials experience a substantially higher loss of 30% of their Start-of-Run (SOR) activity.

Stability of pre-reduced ammonia synthesis catalysts

In a typical ammonia synthesis reactor, the catalyst loading consists of a pre-reduced layer in the first bed and oxidic catalysts in the lower beds. The oxidic catalyst in the lower beds must be reduced in situ over several days during start-up. Some plants use pre-reduced catalyst in all beds to save start-up time and reduce the production of ammonia-containing water during catalyst reduction. This approach can save 2-3 days of reduction time, resulting in a significant increase in ammonia production.

The pre-reduced catalyst is manufactured in a separate step after the oxidic catalyst is produced. While most catalysts are pre-reduced at the same facility as the oxidic

The KM 111 catalyst

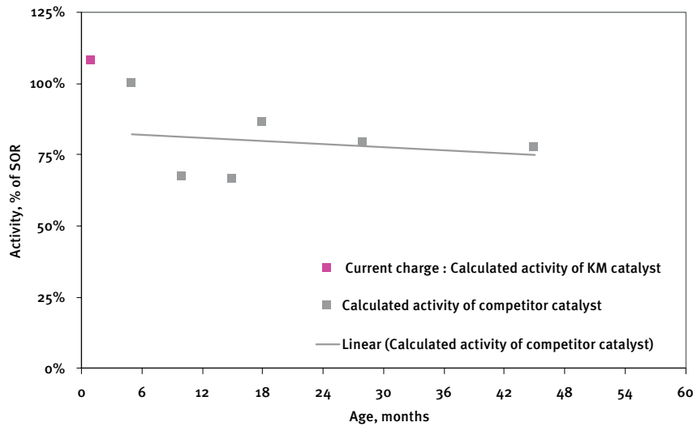
catalyst, some are handled by third parties. It is crucial that this process is carefully controlled to ensure maximum activity, as the catalyst's pore structure is formed during this reduction step. Heating rates and water content must be meticulously monitored. Researchers conducted a detailed investigation which demonstrated that fast reduction results in a narrow reaction zone progressing from the surface to the dense centre. In contrast, high H_2O concentrations inhibit the reaction, leading to uneven reduction across the iron particles.

After achieving full reduction, a separate passivation step is necessary. Without proper passivation, the catalyst may begin to heat up when exposed to air, risking significant delays during loading. In most cases, this would require the reactor to be blanketed with nitrogen. If passivation is inadequate, the catalyst's activity will be lower than expected, and it should be discarded if possible.

From research investigations to market feedback

How does magnetite perform in industrial settings? After over 13 years of successful operations with the KM magnetite catalyst, one plant switched to a wustite-based catalyst.

Figure 2. Comparison of KM111 activity with a wustite-based catalyst



However, this catalyst exhibited much faster deactivation than the previous KM charge. After 10 years, the plant decided to revert to the Topsoe KM magnetite catalyst. The first 12 months of operation with the new Topsoe KM catalyst confirmed its high activity level.

Years of Topsoe's research into magnetite phases and suitable promoters, combined with industrial feedback, led to the launch of the KM 111 and pre-reduced KMR 111 catalysts in 2014. Since their introduction, these catalysts have been installed in over 70 ammonia plants worldwide, representing 25% of the plants for which Topsoe provides catalyst solutions. A recent example is a U.S. ammonia plant that replaced a wustite catalyst with KM111 in a three-bed reactor, using pre-reduced catalyst in the first bed and KM111 in the second and third beds.

The wustite-based catalyst was replaced after four years due to mechanical issues in the ammonia converter. The plant opted for the magnetite-based KM111 due to its lower deactivation rate and higher activity, as clearly demonstrated. ■

News in brief

EUROPE

EU approves EUR3bn German-Dutch H2Global auction for 2025

The European Commission has approved joint plans from Germany and the Netherlands for a EUR3bn (USD3.14bn) subsidy programme for renewable hydrogen and derivatives imports via the H2Global auction mechanism, the EU said.

The competitive bidding process is to be "concluded in 2025", the commission said.

The initiative is substantially larger than the EUR600mn joint initiative that the pair announced in late 2023, as Germany increased its contribution to EUR2.7bn while the Dutch contribution was unchanged at EUR300mn.

Germany had since set aside more than EUR3.5bn for future auctions to follow its EUR900mn solo first round, so it has trimmed that allocation, or may still have funds left for future rounds or other joint tenders, of which it has proposed several.

The German-Dutch "tenders" will be "organised on a multi-region basis" according to the commission, suggesting the programme may resemble the geographically-split multiple envelope structure that Germany consulted on in mid-2024.

The initiative will support the construction of at least 1.875GW of electrolysis capacity globally, most of which will be outside the EU, the commission said. The product will be sold to buyers in Germany and the Netherlands from 2030 onwards. This would be later than the 2027-36 supply period envisaged in the 2023 tender announcement.

The H2Global mechanism aims to close the gap between the cost of production and the price that customers are willing to pay. Specialised entity Hintco buys renewable hydrogen and/or derivatives through long-term contracts with suppliers and re-sells the products via shorter-term contracts, with government funds to cover the expected price difference.

EU edges towards Russian fertilizer tariffs

Further tariffs on agricultural products and potentially fertilizers from Russia and Belarus could be part of an additional package of sanctions this year.

EU trade ministers discussed calls for tariffs, singling out Russian fertilizer imports.

Sweden, together with Denmark, Estonia, Finland, Ireland, Latvia, Lithuania and Poland, have been pushing for the European Commission to propose increased import tariffs on the broadest possible range of Russian and Belarusian imports. Swedish trade minister Benjamin Dousa talked of tariffs "hurting" Russia's economy. Sweden and other countries support tariffs with transition periods for targeted sectors and, so far unspecified, measures to facilitate EU industries' transition away from Russian goods.

Poland and Lithuania singled out the fertilizer sector. "This industry is under huge pressure. It's dying like solar panels 10 years ago," Lithuania's deputy trade minister Simonas Satunas said . "It's another form of exporting Russian gas to the EU," added Satunas, admitting the need to still convince larger member states, notably Germany and France.

Poland is hopeful that enough EU states will support a formal proposal for tariffs during Warsaw's six-month EU Council presidency that starts on 1 January. The current council presidency is held by Hungary, which has consistently opposed sanctions against Russia. Tariffs, sanctions and limits have "failed", Hungarian trade minister Peter Szijjarto said, speaking alongside outgoing EU trade commissioner Valdis Dombrovskis.

But Dombrovskis "welcomes" the proposal for tariffs with officials currently focusing on "agricultural products and possibly fertilizers". Dombrovskis added that, unlike sanctioning gas, tariffs are not a subject matter that requires unanimity of all EU states. Qualified majority voting for tariffs on fertilizers and other agricultural products would give greater weight to larger countries such as Germany, France, Spain and Italy.

German economy minister Robert Habeck noted that other sanctions are possible. "If it's not a sanction system then tariffs might be an option," Habeck said. Habeck favours "immediately" closing loopholes in the EU's system of sanctions against Russia.

Spanish trade minister Amparo Lopez called for caution when imposing tariffs. "We have to know what exactly is the impact of the proposal," Lopez said. But Spain is open to analysing the proposal put forward by Sweden. "It's important that they [tariffs] harm Russia more. We first want to see an assessment of the effects," Dutch trade minister Reinette Klever said.

EU industry association Fertilizers Europe in July called for the EU to set "punitive" tariffs of EUR100-150 on imports of Russian fertilizers to halt financing Russia's war against Ukraine and "clear price undercutting" against EU producers.

NORTH AMERICA

TFI launches ammonia certification programme

Fertilizer and agricultural association The Fertilizer Institute (TFI) has launched a new programme that will standardize the carbon footprint measurement of ammonia production in the US.

The Verified Ammonia Carbon Intensity (VACI) programme will enable domestic ammonia producers to reduce emissions across supply chains with a standardized and certifiable carbon intensity score. The carbon intensity of ammonia will be calculated from feedstock production through the finished product at certain production plants. The accuracy score is also validated by an independent third-party auditor.

The VACI will increase transparency for ammonia consumers, allowing the greenhouse gas emission footprint from using low-carbon ammonia to be quantified, TFI chief executive officer Corey Rosenbusch said.

Ammonia production usually uses natural gas as a feedstock for its hydrogen component, which in turn causes the creation of carbon dioxide emissions as a byproduct.

US ammonia producers such as CF Industries, LSB, Nutrien, OCI and Yara all provided experts to collaborate with TFI on the VACI programme.

Nutrien's Redwater facility in Alberta and CF's Donaldsonville facility in Louisiana are certified under the programme, while audits for LSB's El Dorado facility in Arkansas and CVR Energy's Coffeyville facility in Kansas are in progress.

USDA awards more funding to increase fertilizer output

The US Department of Agriculture (USDA) has awarded over USD100mn across nine states to increase domestic fertilizer production as the effort to make farmer affordability more favourable continues.

About USD116mn will be invested through the USDA's Fertilizer Production Expansion Programme (FPEP) to help eight facilities expand output in California, Colorado, Georgia, Indiana, Iowa, Kansas, Michigan, Oklahoma and Wisconsin.

Recipients include the Michigan Potash Company, where the construction of a new facility should yield 400,000t annually of high-grade potash, and Farmers Cooperative Association, where funding will expand its existing dry fertilizer facility with additional storage and processing capacity.

"When we invest in domestic supply chains, we drive down input costs and increase options for farmers," USDA secretary Tom Vilsack said.

Through the FPEP, the USDA has invested USD517mn in 76 fertilizer production facilities across 34 states and Puerto Rico. President Joe Biden's administration committed up to USD900mn in the programme through the Commodity Credit Corporation, which is expected to support long-term investments by strengthening supply chains.

Higher US fertilizer prices throughout this year deterred fall demand as lower crop prices forced farmers to sell more of a crop to afford nutrients.

The last USDA FPEP funding announcement was in August, when USD35mn was granted to boost seven domestic production projects.

Mosaic US production drops

US fertilizer producer Mosaic's phosphate and potash output dropped for the combined period of October and November from 2023 levels for varied reasons, the company reported.

Phosphate sales volumes totalled 946,000t for October and November, down by 7% from the same period a year earlier, reflecting the impact of lost production and shipments related to hurricanes Helene and Milton. Phosphate sales revenue for the period totalled USD680mn, up slightly from USD677mn in 2023.

Potash sales volumes for the two months totalled about 1.2mn t, down by 25% from the same period a year earlier, but are expected to recover by the end of this year. The major drop in sales volumes was a result of of delayed shipments from Canpotex, the joint marketing arm of Nutrien and Mosaic, caused by Canadian rail and port strikes. Potash sales revenue totalled USD299mn, down from USD506mn in 2023.

Mosaic recently announced potash production resumed at its Colonsay processing facility in Saskatchewan, Canada, after the roof collapsed and output was halted. But Mosaic does not anticipate the event to impact overall fourth quarter sales.

SOUTH AMERICA

Contractor nominated for ATOME's Villeta project

ATOME has announces its nomination for Engineering, Procurement and Construction (EPC) contractor for its 145MW Villeta project in Paraguay, capable of producing approximately 260,000t/yr of calcium ammonium nitrate, and provides an update on continued progress on project finance negotiations.

After lengthy consultations, ATOME has selected Casale S.A, a specialised engineering and construction firm based in Switzerland, as its sole E% contractor for Villeta. As one of the world's most experienced licensors of ammonia technologies in the market, Casale will leverage its suite of cutting- edge technologies in fertilizer production and over

100 years of history in sustainable ammonia and nitrates to deliver ATOME's world-leading innovative facility.

Villeta is an important project for Casale, representing the world's largest dedicated green fertilizer facility upon commencement of operations. Drawing on the expertise and in country knowledge of ATOME's own team, Casale will employ specialist sub-contractors with experience in Paraguay and South America to support development of the facility.

Brazil's Usiquimica buys Argentina YPF subsidiary

Brazilian chemical company Usiquimica acquired YPF Brasil, a subsidiary of Argentinian oil company YPF, on 23 December.

The company did not disclose the value of the transaction.

YPF held all of YPF Brasil, which produces and sells lubricants in Brazil and holds a 2% market share, according to YPF Argentina.

The agreement includes a licensing contract for YPF's lubricant brands, maintaining YPF's presence in Brazil. Usiquimica will control a 48,000 m³/yr YPF Brasil plant in Diadema city, in southeastern Sao Paulo state, according to YPF Argentina.

Usiquimica operates in the transportation, automotive, packaging and chemical segments. It produces, among other chemicals, Arla 32, also known as DEF, and AdBlue in the US and Europe, respectively.

YPF Argentina said the decision is part of a process of reviewing its portfolio to strengthen its position in the new energies segment.

Brazil seeks to raise potash fertilizer output

Brazil plans to add 2.2mn t of potash production by 2029 through starting new projects as part of a national plan to boost agriculture and reduce fertilizer imports.

Brazil imports around 80% of its fertilizer needs, according to the agriculture and livestock ministry Mapa.

Brazilian fertilizer company Potassio do Brasil begun building its Potassio Autazes project in September in Amazonas state, which is one of the country's main potash projects.

The construction is set to last around four and a half years and will start operating around 2029, Potassio do Brasil said.

The unit will have capacity to produce 2.2mn t/yr of potash, which production focused on the domestic market. Brazil imports around 96% of its potash needs.

But some key Brazilian companies in the sector faced financial problems this year, halting operations in fertilizer units across the country.

In October producer Fertilizantes Heringer shut its Dourados and Rosario do Catate units in Mato Grosso do Sul and Sergipe states, respectively, aiming to reduce capital expenditure and other operational costs. The company did not disclose the production capacity of the units.

AFRICA

Namibia bans fertilizer deliveries to neighbours

The Namibian government has prohibited the import, storage, packaging and transit of fertilizers for delivery to countries other than Namibia.

A notice was issued by the agriculture, water and land reform ministry (MAWLR) on 22 November to all companies revoking the importation and in-transit permits for fertilizers. It states that companies have 21 days to package the product in 1t bags and export the material or "surrender the products for destruction" at the company's cost. The ban comes into effect on 13 December.

The notice applies to urea, MAP, DAP, amsul, CAN, NOP, MOP, SOP, NPK and magnesium sulphate. The duration of this ban is not yet known.

Vessels offloading cargo intended for delivery outside Namibia will not be allowed to dock.

The notice cites that the handling and storage of bulk and bagged fertilizers at Walvis Bay does not meet regulatory requirements. It also states that environmental and safety risks for contamination, leakage and exposure to external elements could have a long-term effect.

The Walvis Bay port is used for offloading fertilizer deliveries before they are transited to inland countries such as Botswana, Zambia and Zimbabwe. Shipments for these countries are now likely to be rerouted through Beira, Mozambique.

Negotiations between the governments of Namibia and Zambia are reportedly under way. Zambia is currently experiencing a severe fertilizer shortage, and given the delays at Beira, importing via Namibia and transporting it inland is the country's next best alternative to procure the volumes in time.

ASIA

Madras Fertilizer plans new ammonia urea fertilizer complex

Madras Fertilizers Limited (MFL) is taking a major step towards self-sufficiency in fertilizer production by expanding its facilities. The company plans to establish a new Ammonia and Urea Complex at its site in Manali, Chennai.

To begin the project, Madras Fertilizer invited online bids to prepare a Pre-Feasibility Report (PFR). The bid submission deadline is January 2, 2025. The proposed facility will produce 2,300 t per day (MTPD) of ammonia and 4,000 MTPD of urea. The project's estimated cost is approximately INR10,000 crore.

MFL's production capacity currently stands at 1,050 MTPD of ammonia and 1,475 MTPD of urea. The new complex will significantly enhance its output to meet India's growing fertilizer demands.

The facility's electricity demand is also expected to increase. Tamil Nadu Electricity Board (TNEB) permits a maximum demand of 18 MW, while the current load utilization is 13 MW. With the expansion, the company will likely require additional power to support operations.

This project represents a crucial step for MFL in supporting India's agricultural growth and reducing reliance on imported fertilizers. By increasing local production, the company aims to contribute to the nation's vision of self-reliance in the fertilizer sector.

Fertilizer firms oppose India's green ammonia tender terms

India might revise its tender scheme for renewable ammonia, as the mechanism is facing strong opposition from the fertilizer companies lined up to procure the supply.

The government body organising the tenders, the Solar Energy Corporation of India (SECI), is considering revisions to the tender mechanism following a meeting with fertilizer companies and would-be renewable ammonia producers on 10 December, government officials told Argus. SECI might look at other international tenders or contract structures to see if they can improve existing frameworks for the mechanism, officials said.

India aims to stimulate 739,000 t/yr of renewable ammonia production through the tenders, but the process has been severely delayed as companies have raised concerns over the mechanisms set-up.

During the meeting, fertilizer companies criticised that the tender design and legal framework heavily favour the would-be renewable ammonia producers.

Penalty provisions are “one-sided”, they said, with ammonia producers required to meet only 90% of their supply obligations, while the buyers have no flexibility on their offtake.

The set-up around supply and offtake agreements is “onerous” for procurers, India’s largest fertilizer company Iffco said.

Under the existing framework, renewable ammonia producers would strike a supply agreement with SECI which would then sell the supply on to fertilizer companies through a separate deal. But fertilizer companies criticised the lack of a direct agreement between producer and buyer. This means that “no enforceable rights” are granted to the buyers, leaving them “open to litigation” from the producer, they said.

The firms suggest that a tripartite agreement involving both sides and SECI would reduce such risks and align with standard practices in the fertilizer sector. But renewable ammonia project developers favour the current arrangement which mirrors practices in the electricity sector.

That said, would-be renewable ammonia producers have previously also criticised certain aspects of the mechanism’s design. In any event, the primary challenge remains the price differential between conventional “grey” and renewable ammonia. Only a small part of this difference would likely be bridged with the three-year subsidies that producers could secure through the tender.

Fertilizer companies expect price parity with grey ammonia and are unwilling to pay any premium, according to industry participants. They have urged the government to establish a framework for compensating the full price differential, arguing that Delhi previously indicated that it would do so.

India’s Andhra Pradesh pushes on with green H2 projects

India's southeastern coastal state of Andhra Pradesh is making strides towards becoming a key region for production of renewable hydrogen and derivatives, with the state government approving subsidies for the most advanced project and progressing separate plans for a giant hub.

The state government on 6 January announced approval of a slew of "custom incentives" for AM Green's planned 1mn t/yr renewable ammonia project at Kakinada, on which the firm took a final investment decision (FID) in August. The incentives are partly based on the state's Integrated Clean Energy Policy from last year.

They will entail a subsidy on capital costs — including for the electrolyser — of 25%. This is capped at 18.5mn Indian rupees (USD215,390) per 1,000 t/yr of renewable ammonia production capacity, which means the maximum support for AM Green's plant would amount to just over USD215mn.

Industry sources previously suggested that the project would involve investment of around USD1.5bn, meaning the capital cost subsidy might not cover the full 25%. AM Green has not disclosed further information on its financing framework for the facility.

The state subsidies will be granted over a five-year period following the facility's commissioning. AM Green is planning to commission a first 500,000 t/yr phase by 2026 and to have the full 1mn t/yr online by 2027.

Other incentives include 20% capital cost subsidies for a desalination plant, exemptions from stamp duty fees, reduced water supply charges, five-year exemptions on state goods and services tax on sales of renewable hydrogen or derivatives and reimbursement of electricity duties.

Another large project in Andhra Pradesh is state-owned NT% Green Energy's green hydrogen hub at Pudimadaka near the port city of Visakhapatnam. Prime minister Narendra

According to government agency PIB, the hub could eventually produce 1,500 t/d of renewable hydrogen — over 500,000 t/yr — which could be used to make 7,500 t/d of green derivatives such as methanol, urea and sustainable aviation fuel, primarily for export markets. This makes it one of the largest renewable hydrogen projects planned globally, although the timeline for the development remains unclear.

The project is due to include the development of 20GW of renewable energy capacity and is expected to involve an investment of Rs1.85 trillion, PIB said.

AUSTRALASIA

Australia’s Agfert to raise fertilizer storage capacity

Australia's Agfert Fertilizers expects its new 20,000t fertilizer storage and distribution centre on the Eyre peninsula in South Australia to be completed in February or March next year to meet demand for the new fertilizer application season.

The new centre will have around 10,000m² of undercover storage, split into three large stockpiles and eight smaller areas. Equipped with five multi-hoppers, products at the facility will be able to load on an 80m weighbridge, supporting triple road trains loading at the facility. Once completed, Agfert Fertilizers will have approximately 80,000t of fertilizer storage across Southern Australia.

Urea, phosphates, and other fertilizers will all be stored at Agfert's Cowell and Balaklava facilities, with the total throughput expected to be around 100,000 t/yr or more.

Fertilizers in Southern Australia are mostly used on wheat, barley, canola, and legumes.

Agfert will also store and distribute ''N-Shield Urea,'' which increases fertilizer efficiency by reducing leaching by up to 30% while also lowering greenhouse gas emissions. The inhibitor helps keep the nitrogen in the immediate profile, increasing yields by not losing them to volatilisation or underground water streams. ■

Soft commodities: Russia's wheat production still in question

Information from ***Argus Agritel Outlook***

Wheat summary

France's wheat exports to non-EU countries continued to lag in December as the country struggles to compete with lower-priced origins. Exports to non-EU destinations so far this marketing year stood at only 1.7mn t by the end of December. We have cut our forecast for France's non-EU exports to 3.8mn t for the whole marketing year, 200,000t down from our previous estimate. But given France's low supply and a tighter global export availability in January-June, the origin should be able to secure market shares later in the season. At the same time, delayed corn availability and some quality issues on the French corn crop have pushed more feed and industrial demand towards wheat. As a result, we expect the country's ending stocks to fall to 2.3mn t at the close of 2024-25. In Russia, we have cut our Russia wheat export forecast to 44.5mn t for 2024-25, compared with 47mn t for the USDA. The country's export pace has slowed in December. Russia's government set a grain export quota at 10.6mn t in late December, after its customs sub-commission approved an 11mn t quota in late November. The export quota applies from mid-February to late June. Looking out to 2025-26, we expect Russia to export just 42mn t for now, amid potential risks on the country's production. Weather conditions are mild in the south of the country, enabling the continued development of the winter wheat crop. But the crop could suffer in the event of a cold snap later this winter and in the absence of a protective snow cover. We continue to run a worst-case scenario with output falling below 80mn t, which would restrict exports to 38mn t. For the EU and the UK, Argus projects an increase in availability because of production rising to 146.8mn t from 130mn t in 2024-25, and despite lower carryover stocks. Exports in 2025-26 should rise to 33.5mn t from 26.3mn t this season, slightly above the five-year average. In the US, we expect wheat harvested areas to be stable. Overall, we expect an increase in supply and exports for the top eight exporting regions in 2025-26. In importing regions, India's wheat prices have risen in recent months. Authorities are reportedly asking trading companies to avoid holding on to stocks to ease local prices, while import duties remain in place. As of now, we expect the country's production to rise by almost 6mn t to a record 118mn t in 2025-26, although we note weather risks inherent to the La Nina weather phenomenon, which could bring unseasonably high temperatures during the winter and in turn lower the wheat yield potential. On the demand side, the country's industrial demand is expected to remain stable despite a rise in population. And Mexico's production could fall to historical lows in 2025-26. Limited rainfall in Mexico's northern regions in recent months hampered planting progress. Less than half of projected areas have been sown so far. Harvested areas are forecast to drop to around 230,000 hectares (ha) from 460,000ha for the 2024 harvest, an already low level. Production could stand at just 1.3mn t, implying import needs at 7mn t.

Feed grains summary

Weather risks in South America are the main drivers in the corn market at present. The top four exporting regions recorded strong exports at the start of the marketing year, particularly from the US given a tighter supply available in Ukraine. Therefore, any shortfall in exports from South America will boost demand for US exports further and lend support to prices. Uncertainties prevail for Argentina's corn crop.

Figure 1. Wheat price (USD/t)

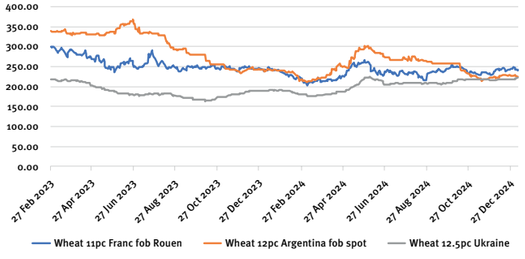


Figure 2. Corn price (USD/t)

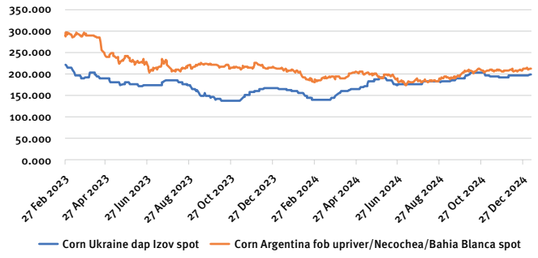
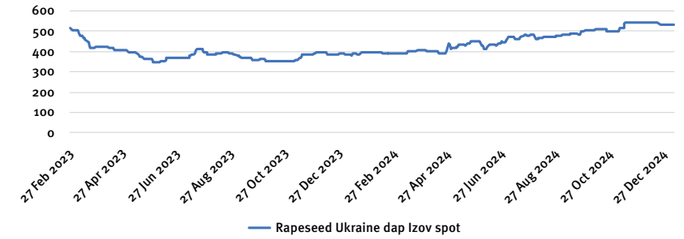


Figure 3. Rapeseed price (USD/t)



Unseasonably hot and dry weather forecast in Argentina could constrain the yield potential and cut production by up to 9mn t. For now, we forecast the country's production at 48.4mn t, but we run a worst-case scenario at 39.7mn t should unfavourable weather conditions cause significant production issues. Argentina's 2024-25 corn output will become available to the market from March and is needed to offset lower production in Ukraine and supplement northern hemisphere supplies after strong US exports recently. The USDA last forecast Argentina's production at 51mn t in its December Wasde report. In contrast, parts of Brazil are forecast to receive above-average rainfall, because of a La Nina weather pattern. This could delay the soybeans harvest, and in turn lead to delayed planting for the country's safrinha — or second — corn crop, which ideally needs to take place before March. We still expect Brazil to produce 125.4mn t. Argus forecasts exports at 42mn t, instead of 48mn t from the USDA in December, because of rising demand in the ethanol sector. We forecast overall industrial demand for corn at 24.5mn t, compared with the USDA's 21.5mn t. Brazil's 2024-25 second corn crop volumes typically reach the market in July. Any reduction in the corn output from South America could push demand towards the US origin, as was the case in 2017-18 when La Nina damaged the Argentinian corn crop and US exports ended up above expectations in the second half of the campaign. As of now, we estimate US corn exports in 2024-25 at 63.3mn t, while the US revised those up to 62.87mn t in December. With a tight balance sheet in Brazil and Ukraine, any crop incident in Argentina will also support corn prices in Chicago, which has implications for the next crop. Corn is now more attractive for US producers than soybeans, which could influence planting decisions. As an initial forecast, our model suggests an increase in corn harvested areas to 34.3mn ha in 2025-26 against 33.5mn ha in 2024-25, although we note the potential for our forecast to evolve in the coming months. In the rest of the feed complex, we expect EU and UK winter barley areas to be stable in 2025-26. Low malting barley premiums could dampen farmers' appetite for spring barley planting, as the western European spring crop is largely of malting quality. We forecast spring barley areas at 5.04mn ha, down compared with 5.15mn ha in 2024-25. Despite lower areas, barley production is due to increase by more than 1mn t compared with the current season, as crop conditions are good in most of western Europe. That said, we note some risks related to high rainfall in France.

Oilseeds summary

A La Nina weather pattern is forecast to bring unseasonably wet weather in Brazil's centre-west regions. Heavy rainfall could delay the progress of field works and lead to a late start to soybeans harvest. A delayed harvest could tighten the country's supply availability in the short term, especially as the country heads into its new local marketing year with beginning stocks at multi-year lows. Crushing activity was well above seasonal norms in October and November, which contributed to bringing the 2023-24 stocks/use ratio below the 4% threshold. That said, crop conditions remain very good and total 2024-25 output is still forecast at a record 169mn t with output in Mato Grosso leading the way, in line with the USDA's December forecast and above Brazil's Conab at 166.2mn t. The relative weakness of the Brazilian real against the US dollar will also be worth monitoring when Brazilian shipments ramp up. At the end of December, a weakening real against the dollar made the origin more competitive against the US origin. In contrast, Argentina's weather is forecast to be unseasonably hot and dry. This could damage crop conditions in the early development stages. Our production expectation for Argentina under a base-case scenario is at 51mn t, but we have drawn up a worst-case scenario which could see output shrink to 44mn t. A reduced output has the potential to restrict the crush to 35mn t, compared with a base-case expectation at 42mn t. The USDA forecast 52mn t for Argentina's production in its December Wasde report. While the level of US supply appeared to be higher than expected demand in the coming months, a restriction to South America's soybean production could shift some demand towards the North American origin and lend support to the market. Despite the weather uncertainties and crop risks highlighted in South America, we confirm for now a bearish three-month price outlook for soybeans because of the ample US supply and macroeconomic concerns. That said, should the unfavourable weather concerns mentioned above materialise, our mid-term price outlook may firm. On the rapeseed market, tight crush margins in the EU have pushed crushing demand towards alternative oilseeds. The bloc's rapeseed crushing activity fell well below the 10-year range in November. At the same time, the region ramped its imports and crushing of soybeans. In Canada, we maintain a canola production estimate for 2024-25 at 18.4mn t despite StatCan's 17.8mn t December estimate. In Australia, we revised our production expectation up slightly to 5.6mn t in line with the USDA. That said, with lower production on the year in Canada and constrained output in the EU, the slight increase to the forecast for Australia is not enough to change the global balance sheet. In the rest of the complex, palm oil stocks in China and India were below the five-year range in October, suggesting more demand to come and a tighter supply-demand balance. ■

Hard commodities: Dollar-based headwinds

Written by **David Fyfe,** *Chief Economist,* ***Argus Media, UK***

A post-election "Trump trade" has driven US financial markets higher as the end-2024 approaches. With the resumption of a traditional inverse relationship between the US dollar and crude prices, and amid expectations of widening interest rate differentials in 2025, dollar strength could again prove a headwind for oil demand and therefore prices.

US financial and equity markets have surged in the last three months of 2024. What began in response to Federal Reserve interest rate cuts in September continued amid a raft of economic indicators showing the resilience of the US jobs market and strong consumer confidence, notwithstanding nagging concerns over inflation.

Unemployment remains modest at around 4% - lower than anticipated after the sharpest hike in interest rates since the 1980s. A combination of loose fiscal policy, cheap energy and the interest rate offset from US fixed rate mortgages has seen the US navigate recent market and supply chain turbulence more smoothly than many rival nations. Consumer spending is growing at a healthy 3% year-on-year, and consumer price inflation is approaching the Fed's 2% target, even if service sector and wage inflation remain high.

The bullish trend has been re-enforced by a so-called "Trump trade" following November's resounding victory for a business-friendly Trump and Republican trifecta after the Presidential and Congressional elections. While economists fret about the longer-term consequences if the US turns protectionist, the markets are instead focused on de-regulation and tax cuts, even if the pace of US Federal Reserve interest rate cuts in 2025 slows as a result.

US dollar transactions

For commodities, the strength of the US dollar could be the most influential element of this "Trump trade" early in 2025. After 12 months of atypical co-movement between crude prices and the USD Index, a more common inverse relationship has resumed. Brent futures may be struggling to hold above USD70/bl despite an impressive OPEC+ rollover, tight consumer inventories and myriad geopolitical uncertainties, but the "Greenback" is trading near 20-year highs.

Indeed ongoing dollar strength, alongside accusations of US currency "weaponization" via financial sanctions, led some to predict a rapid erosion of the dollar's pre-eminent global trade and reserve currency role. But while China has increased non-dollar transactions in its dealings with major commodity exporters, and emerging market central bank buying also propelled gold prices to record highs earlier in 2024, reports of the dollar's imminent demise seem premature. The vast majority of eight billion tons of annual energy, metals and grains trade globally continues to be transacted in US dollars.

So the outlook for the US dollar continues to matter for oil and commodity demand. Conventional wisdom sees a strengthening US dollar elevating oil import costs in local currency terms. Between June-2023 and April-2024, while the dollar cost of crude rose by an average 15%, dollar appreciation meant major importers paid between 20% and 35% more for supplies in local currency terms, with Turkey facing an eye-watering +95% cost increase in the same period. And while short-term oil demand may remain most responsive to income changes or structural substitution (think EVs in China in 2024), secondary foreign exchange impacts should not be overlooked.

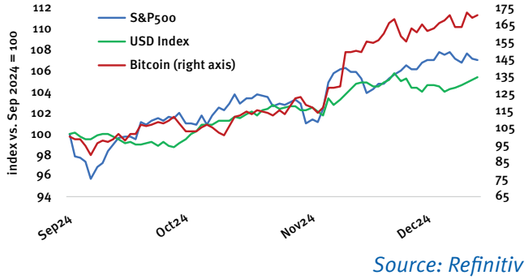
Interest rates

With Atlantic Basin inflation pressures now receding, central banks have begun cutting interest rates again. Crucially however, 2025 could see a differential in the pace of policy loosening between the US Federal Reserve on one hand, and the European Central Bank (ECB) and People's Bank of China (PBoC) on the other. A further 25 basis point cut is expected from the Fed. in December, but then only two or three further cuts in 2025. Not only did US headline CPI tick higher again in November, but core inflation, service costs and wage growth all remain above target. Add in potential short-term stimulus from deregulation and tax cuts by the incoming Trump Administration, plus inflationary import tariffs and immigration controls longer term, and the rationale for the US Federal Reserve caution becomes clear.

With the ECB facing anaemic growth, and PBoC confronting outright price deflation, interest rates here should fall more rapidly than in the US. GDP projections see the Eurozone struggling to attain 1% growth in 2025, not least as Germany confronts a possible third year of manufacturing recession. China's Communist Party Politburo this week flagged a switch to an appropriately loose monetary policy in the months ahead, both to head off deflationary risks and as a pre-emptive move to offset steeper US import tariffs by further weakening the Yuan.

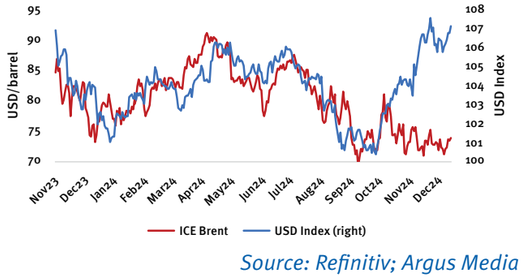
The underlying resilience of the US economy relative to its trading partners, plus a potential divergence in interest rates could sustain dollar strength in 2025. So while surging non-OPEC oil supplies, lapses in OPEC+ production discipline or Chinese deflation may represent the most significant headwinds for the oil market next year, a stubbornly strong US currency could play a key secondary role on the demand side too. ■

Figure 1. US asset markets since September



Source: Refinitiv

Figure 2. ICE Brent & USD Index



Source: Refinitiv; Argus Media

Shipping and trade news

ICS, 47 countries propose GHG charge for international shipping

The International Maritime Organisation (IMO) has received a joint proposal from 47 governments around the world to adopt a greenhouse gas (GHG) pricing mechanism for maritime transport.

The joint submission, backed by the International Chamber of Shipping (ICS), proposes amendments to the International Convention for the Prevention of Pollution from Ships (Marpol) that would require shipping companies to make annual contributions per tonne of CO_2 equivalent of GHG emitted to a new IMO fund.

The main aim of the GHG charge is to reduce the cost gap between zero or near-zero emission marine fuels and conventional bunker fuels.

"The joint text put forward by this broad coalition is a pragmatic solution and the most effective way to incentivise a rapid energy transition in shipping to achieve the agreed IMO goal of net zero emissions by or close to 2050," ICS secretary-general Guy Platten said.

The proposal suggests rates should be set based on information reported to the IMO's ship fuel database. The details are expected to be debated at the next IMO meeting in February. And if the Marpol amendments are approved by the IMO in April, they should enter into force globally in early 2027, with the collection of annual GHG charges commencing in 2028.

Countries that signed the proposal include all EU members states, the UK, Japan and South Korea, along with key flag states such as Panama and Liberia.

US rail group optimistic about 2025 rail demand

US rail volume is likely to start strong in 2025, but railroads will need to navigate changing federal policies, the Association of American Railroads (AAR) said.

Volume next year hinges on a few key factors, including the resilience of consumer spending, strength in the labour market, and the trajectory of inflation and interest rates, the group said.

Railroads will need to remain vigilant as these economic indicators will be critical in helping assess rail traffic and broader economic health in the months ahead, AAR said.

"Strong intermodal growth and stable consumer demand offers reasons for optimism," AAR said. "But railroads and the economy alike must navigate evolving policies and potential disruptions" as the US enters 2025 under a new administration, the group said.

The AAR'S optimism comes as rail traffic in November "while by no means stellar, suggests that the broader economy remains on stable footing", AAR said.

US intermodal rail volume set new records in November. The increase reflected strong consumer demand following job gains that pushed increased spending, AAR said. Intermodal traffic is made up primarily of consumer goods shipped in containers between different modes of transportation, although some scrap metal and specialty agriculture products ship this way.

US railroads loaded an average of 282,000 intermodal containers and trailers per week, up by 11% from a year earlier. That was the highest weekly average for any November since AAR began tracking intermodal data in 1989.

Carload traffic fell by 3.8% compared with November 2023. Carload traffic is primarily made up of commodities.

Coal was the "biggest problem", AAR said. US railroads loaded 15% less coal last month compared with a year earlier, while year-to-date loadings were down by 14% from the same 11 months in 2023.

FREIGHT RATES

POTASH	Price type	Units	Timing	Low	High	Date
Dry potash Vancouver - China 60-65kt	outright	USD/t	prompt	18	20	03-Jan-25
Dry potash Red Sea - WC India 25-30kt	outright	USD/t	prompt	23	29	03-Jan-25
Dry potash Baltic Sea - Brazil 30-40kt	outright	USD/t	prompt	45	60	03-Jan-25
Dry potash Baltic Sea - SE Asia 25-30kt	outright	USD/t	prompt	70	105	03-Jan-25
Dry potash Vancouver - SE Asia 25-30kt	outright	USD/t	prompt	55	57	03-Jan-25
Dry potash Baltic Sea - China 60-65kt	outright	USD/t	prompt	60	85	03-Jan-25
Dry potash Baltic Sea - US Nola 50-55kt	outright	USD/t	prompt	50	65	03-Jan-25
Dry potash Vancouver - Brazil 30-35kt	outright	USD/t	prompt	47	49	03-Jan-25
Dry potash Hamburg - Brazil 30-35kt	outright	USD/t	prompt	19	21	03-Jan-25

SULPHUR	Units	Low	High	Date
50-60kt – Vancouver-China	USD/t	26	28	03-Jan-25
Below all 30-35kt				
Mid East – EC India	USD/t	19	21	03-Jan-25
Mid east – North/River China	USD/t	27	29	03-Jan-25
Mid East – South China	USD/t	23	25	03-Jan-25
Mid East – Brazil	USD/t	26	28	03-Jan-25
Mid East – North Africa	USD/t	36	42	03-Jan-25
Mid East – South Africa	USD/t	23	24	03-Jan-25
Black Sea – North Africa	USD/t	40	45	03-Jan-25
Black Sea – Brazil	USD/t	50	55	03-Jan-25
Baltic – Brazil	USD/t	45	50	03-Jan-25
Baltic – North Africa	USD/t	40	45	03-Jan-25
35-40kt – US Gulf - Brazil	USD/t	25	26	03-Jan-25

If coal were excluded, monthly US carload traffic in November would have notched a 10th consecutive year-on-year increase.

Industrial products volume was down by 1% from a year earlier. Manufacturing is a major driver of US carload traffic, and that sector remains sluggish, AAR said.

Australia's Centrex sees record December phosphate shipment

Australian producer Centrex will ship around 30,000t of beneficiated phosphate rock to a New Zealand importer in early December, surpassing its previous record shipment of 26,502t in September.

"Our stockpiling and production ramp-up strategy has enabled larger, more efficient shipments, which in turn are expected to support improvements in operating margins," said Centrex's chief executive officer and managing director, Robert Mencel.

Centrex has 28,159t of product from its Ardmore mine in storage at Townsville Port as of 25 November.

Centrex mined over 180,000t of phosphate rock at its Ardmore mine over the third quarter of this year, well above the second-quarter figure, which was below 130,000t. The firm expects mining output at Ardmore — run by its wholly-owned subsidiary Agriflex — to reach 625,000 t/yr after the end of the year, later than the original December 2024 estimate. Centrex produces 34% P_2O_5 beneficiated phosphate rock. Centrex produced 66,807t of mined ore, 33,341t of crushed ore, 37,455t of plant feed and 26,910t of concentrate in October.

It uses the same railway system as other miners in the region, such as Incitec Pivot (IPL), to move commodities to Townsville before export. IPL recently said its Phosphate Hill mine is reliant on Glencore's nearby Mount Isa Mines copper smelter staying open. Sulphuric acid is a byproduct of copper smelting and a key raw material needed to produce DAP/MAP, so Phosphate Hill could be negatively impacted if the smelter were to close. If Phosphate Hill stops output, this would increase rail transport costs from mines to Townsville, making Centrex's phosphates less competitive in pricing.

Brazil's Bndes backs Rio Grande port recovery

Brazil's Bndes development bank has approved a BRL373.5mn (USD64.5mn) credit for the recovery and resumption of activities at the Luiz Fogliatto Maritime Terminal (Termasa), in the port of Rio Grande.

The terminal, in Rio Grande do Sul state, has been inoperative since May, when the floods that hit the southern Brazilian state damaged the terminal.

The total amount will be divided into two financing operations for Termasa's owner, CCGL Group. The Bndes operation will earmark BRL280mn from the Bndes Emergency program to restore the operational condition of the pier, which will require reconstruction of ship berths, including platforms.

In the other operation, BRL93.5mn in emergency credit supports the company's need for liquidity, by offering working capital for actions to mitigate and adapt to climate change and resume economic activities.

Termasa is located on the western side of the access channel to the port of Rio Grande, which enables the export of products from Rio Grande do Sul state and the southern region of Brazil, with its strategic location close to Uruguay, Argentina and Paraguay.

The CCGL Group operates predominantly in the industrialization of dairy products. Termasa handles soybean meal, soybeans, corn and wheat, has berths capable of receiving Panamax ships and has a storage capacity of 258,000 t of solid agricultural bulk in nine warehouses, and 278,000t in four vertical silos.

Timeline slips for LSB's Texan CCS-based NH3 project

US fertilizer producer LSB Industries, along with global leaders in energy and chemicals — Air Liquide, Inpex and Vopak — plan to jointly develop a 1.1mn t/yr low-carbon ammonia export-oriented plant on the Houston Ship Channel by 2027.

Industrial gas firm Air Liquide and Japanese oil firm Inpex plan to produce low-carbon hydrogen at the site in Texas, using autothermal reforming and carbon capture and sequestration (CCS). At least 95% of direct CO_2 emissions from production will be permanently sequestere, equating to 1.6mn t/yr of CO_2.

LSB will use the low-carbon hydrogen to produce ammonia and plans to organise offtake agreements in collaboration with Inpex, prospectively the project's largest investor. The majority of output will go to power generation in Asia, the companies said. Minority volumes could go to Europe and the US. The partners plan to be "first movers for a new wave of low-carbon energy exports", Vopak said.

Co-firing ammonia with coal for power generation has been touted as a potential way of meeting emission reduction commitments for resource-poor Asian countries such as South Korea and Japan. Japanese power utility Jera plans to test a 20% co-firing mixture of ammonia with coal in early 2024 but commercial operations are not planned until 2025-30.

The partners completed a prefeasibility study earlier this year at the site on the Houston Ship Channel, where Vopak owns and operates an ammonia terminal, which is already equipped with storage tanks and deep-water berths. Vopak will build additional storage capacity as necessary to handle the new volumes.

LSB's other planned CCS ammonia facility in El Dorado, Arkansas is on track for commissioning in 2025, pending a successful EPA class VI permit approval. The project is expected to produce ammonia with a 50% CO_2 reduction, compared to traditional ammonia, below the EU's minimum threshold for greenhouse gas emission reductions of renewable fuels of non-biological origins, which the EU renewables directive puts at 70pc.

The company is targeting the domestic alternative marine fuel sector with the reduced-carbon sullpies produced at El Dorado, after partnering with US-based ammonia fuel cell specialist Amogy.

NITROGEN/UREA		Units	Low	High	Date
Middle East - US Gulf	45kt	USD/t	27	29	03-Jan-25
Middle East - Thailand	30kt	USD/t	26	28	03-Jan-25
Middle East - Brazil	40kt	USD/t	20	22	03-Jan-25
Baltic - Brazil	30kt	USD/t	27	37	03-Jan-25
China - India	60kt	USD/t	18	22	03-Jan-25
Algeria - Brazil	30kt	USD/t	19	21	03-Jan-25
Algeria - French bay	12kt	USD/t	20	22	03-Jan-25
Baltic - EC Mexico	30kt	USD/t	29	34	03-Jan-25
Baltic - WC Mexico	25kt	USD/t	45	52	03-Jan-25

PHOSPHATES		Units	Low	High	Date
Morocco – Brazil	30kt	USD/t	18	20	03-Jan-25
Tampa – Brazil	30kt	USD/t	26	28	03-Jan-25
Saudi Arabia – EC India	30kt	USD/t	19	21	03-Jan-25

AMMONIA	Units	Latest	Date
Ras al Khair - Ulsan, 23kt	USD/t	72	08-Jan-25
Ras al Khair - Kakinada, 23kt	USD/t	40	08-Jan-25
Ras al Khair - Kandla, 23kt	USD/t	21	08-Jan-25
Point Lisas - Ulsan, 23kt	USD/t	120	08-Jan-25
Point Lisas - Houston, 23kt	USD/t	32	08-Jan-25
Point Lisas - NW Europe, 23kt	USD/t	52	08-Jan-25
Bontang - Ulsan, 23kt	USD/t	32	08-Jan-25

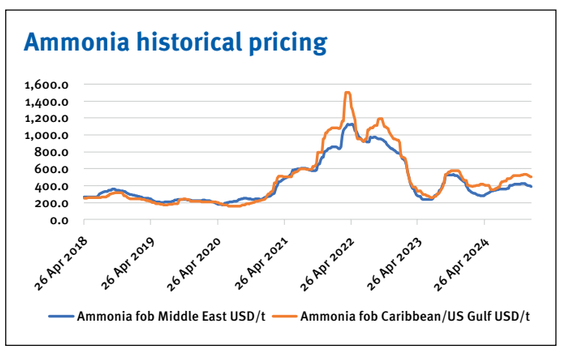
Price watch

*These market insights are provided by **Argus Fertilizer Analytics team***

AMMONIA

Bullish pricing for long-term outlook

Global sentiment has realigned after months of differing price movements either side of the Suez Canal. The tightness afflicting markets around the Atlantic basin over the past few months persists, but is now being matched by markets east of Suez after a stagnant third quarter for regional prices. An unexpected Saudi Arabian outage prompted the sentiment switch, adding to a, now delayed, planned maintenance at a time when Indian buyers are actively seeking spot cargoes. Ma'aden was forced to halt production at its 1.1mn t/yr MWSPC unit in early September for a month following a fault, and will proceed with planned maintenance on another1.1mn t/yr unit for a month from early October. With much less ammonia available to buyers in India while in the peak purchasing period for rabi, delivered prices have responded. Compounding the tighter market scenario is the lack of spot availability from Indonesia as producers increasingly turn their attention to the domestic market. And in the west, production rates in Trinidad are on the rise after a series of gas cuts over the summer months but the fall fertilizer demand season in the US is approaching, with pre-pay deliveries expected from mid-October, and buyers in Morocco and Europe remain active , keeping west of Suez markets short. The fourth quarter of this year will be characterised by bullish pricing across all major benchmarks as production struggles to keep up with seasonal demand requirements, further amplified by the smattering of production outages and lower merchant supplies. We expect a peak to be reached in late November or December in most regions, at which point fertilizer demand in the US, Europe and India typically begins to weaken. And new supply in the US Gulf, and potentially from the Taman terminal project in Russia, will shift the fundamentals into oversupply come the turn of the year, which will be especially apparent in the US and Europe. We currently assume Gulf Coast Ammonia's 1.3mn t/yr merchant unit will produce test volumes before the end of the year, before commercial operations begin in earnest in late2024. But with regards to Taman, exports have been delayed as a result of the Russian government's unwillingness to grant export licences for dangerous products via the port, which is within striking distance of Ukraine's military. When the government will deem it safe enough to allow exports to begin is unsure, and there is a growing risk that no exports are possible while the conflict persists. For now we are accounting for a 23,000t shipment per month in our balance forecast from January.



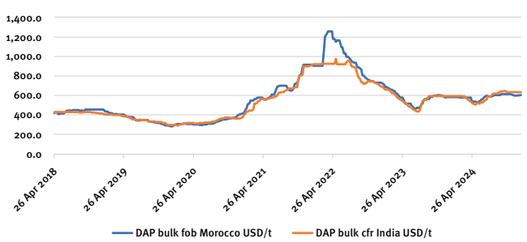
If our supply assumptions hold, the ammonia market should begin its transition back towards the price stability of 2015-20 in 2025. Prices will still follow seasonal fluctuations, but the sudden price shifts precipitated by unplanned supply shocks should be softened by the additional market supplies. The global market should be well-supplied in the first quarter as demand pulls back with sharp downwards price corrections occurring, but some resistance in the form of the US spring application season will slow west of Suez price declines over the second quarter. A nadir will be reached in August of USD285/t fob Middle East and USD300/t fob Caribbean on a midpoint basis, when demand is weakest. Stronger prices will return into the fourth quarter as European gas prices build, and buyers return to the market ahead of crop seasons in several major demand hubs towards the end of the year. Improved supply options to west of Suez markets should prevent prices from reaching similar levels to this year in the region — Tampa cfr is expected to reach USD370/t by the end of the year — but there remains a risk that poorly-timed outages can drive prices up rapidly. While we still expect the price movements of the ammonia market in 2025 to be less volatile, geopolitical developments have brought into focus some fresh risks to our price forecast that could flip this narrative. We are monitoring the situation in the Middle East to assess the threat to merchant ammonia supply out of the region with a particular concern being a scenario in which Iran forces the closure of the Strait of Hormuz, a passage of water linking Mideast Gulf states to the Indian Ocean, potentially stranding 2.9mn-3.4mn t/yr of merchant volumes from other nations that traverse the strait. We do not forecast political decisions such as this, and itis our policy to only update our forecasts to include such factors once they are enacted, so there will be no change to our balance or pricing as a result of this threat. But it does add yet more risk to our forecast, with potentially dramatic consequences for ammonia prices if Middle Eastern supply is impacted.

PHOSPHATES

Rumours of possible MRP rise in India

Global phosphate markets are holding broadly stable-to-soft. Which is interesting, considering there is notable demand, at least on paper, from south Asia, despite it being off season and a fresh appetite for DAP from Ethiopia. When you add this to limited availability from China, then the current price trend could be considered surprising, but they do mean that material softening is off the cards. There is also an upside risk to our forecast as, if existing commitments to Ethiopia are not fulfilled by China because of tightened restrictions, then non-Chinese suppliers will have to be chased, adding some upwards pressure. But for now we do not consider that a reality, so Chinese fob levels are anticipated to enter a period of stability that will last until the end of the first quarter. Meanwhile, other benchmarks will incrementally track lower. Even though Chinese fob levels will disconnect from other regions, the gap will be small, as DAP fob Morocco and DAP fob Saudi will only slightly soften. While there is set to be some out of season buying in India, affordability hurdles will set a limit on the volumes locked in, and the bulk of the buying will continue to be carried out by government-backed companies. Even with Indian importer losses being covered and more out-of-season buying taking place, uncertainty over when payments from the government will materialise will keep buyers hesitant. This stock erosion means that India will have little room to avoid higher prices in April 2025, particularly when Chinese volumes are limited and as the US and Europe will be looking to secure tonnes for spring at the same time. Ultimately, this competition is expected to cause DAP prices to firm over this period, but affordability concerns in all major regions, and not just India, will limit the upside gains. This firming across DAP fob levels will continue into May as south Asian demand outpaces supply. By June, reintroduced Chinese tonnes and the US and Europe off season will mean the limited but remaining buyers will be able to grind down DAP prices until August. Soon after, reduced supply as flexible producers look to the MAP market, alongside healthy demand for rabi, will push the market back into a deficit and by October DAP prices will firm again. In the US there are notable carry-over stocks, which will slow the market down. Firmer winter-fill pricing will be limited, but we expect a substantial increase ahead of spring with a notable spread developing in 2025, similar to2024. US DAP and MAP availability west of Suez will sustain seasonal supply-driven price shocks. But, having said this, some carry-over and affordability concerns will temper the gains. Meanwhile, in Brazil, the market is largely stagnant, with both buyers and producers satisfied. But over the next month or so, we anticipate MAP cfr Brazil will need to marginally soften to incentivise buying, but it will be slow and become more notable in February, when demand is still weak. Prices will receive upwards support as safrah demand is met with reduced exports from China. But once Chinese tonnes are reintroduced a narrative of slight softening between May and July will return. Ultimately Brazil is tracking typical seasonal patterns, but with less volatility, given a more consistent supply stream and increasingly diversified phosphate products, particularly with superphosphates.

Phosphates historical pricing

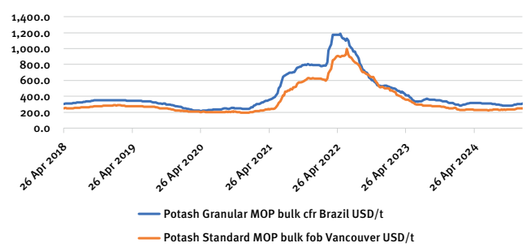


POTASH

Russia and Belarus exports continue to strengthen

The MOP market has shown the first indication of prices rising after a prolonged period of softening. MOP prices are low compared to other fertilizers, which is encouraging demand, and suppliers are gradually raising offers where possible. This upward momentum on price will continue into 2025, although competitive supply and the supply resurgence of Belarus and Russia will limit price increases. The global supply picture is very different for the three largest producing countries and the rest of the world. Production from Canada, Russia and Belarus has been strong so far this year. Nutrien achieved record sales in the third quarter while still operating below capacity, and Mosaic can increase production into 2025 with new capacity at the Esterhazy site, and trouble-free operation at Colonsay. Exports from both Belarus and Russia have risen significantly this year. Belaruskali has shipped a total of 9.9mn t MOP on Russian railways so far this year, surpassing the 9.4mn t transported by rail in the whole of 2023. Uralkali's shipments moved by rail in the year to November have reached 9.7mnt, compared to 7mn t in the same period of 2023. Exports will probably be flat on this level or fall back slightly in 2025as Belarus president Alexander Lukashenko has suggested the country cut its MOP output in an attempt to support prices. Even if Russian producers do not follow this course of action, there is limited capacity for Uralkali to ramp up, and Eurochem ramp up is limited to incremental growth at the Volgakaliy site until second phase expansion commissions at Usolskiy. Elsewhere, MOP supply has been relatively constricted, and this is likely to continue in 2025. ICL is facing challenges in shipping from Israel, although rising shipment levels from Spain are offsetting to keep sales stable for the company overall. K+S is prioritising sales of fertilizer specialties with the strength of the SOP market, reducing MOP production in Germany as a result even with limited supply options for European buyers. Production ramp up in Laos has also been slower this year than in recent years, as Asia Potash is focusing on remedial work on its second shaft, and the third expansion shaft is not expected on line until 2025. Chinese domestic

Potash historical pricing



production has also faced challenges this year, with greater environmental restrictions imposed on producers. Import demand this year has been exceptional from two of the largest markets globally, Brazil and China. Brazil's imports in 2023 should surpass last year's record of 13.4mn t, although some of this is taking demand from 2025 as buyers have come to the market exceptionally early for the 2025-26soybean season, securing purchases while prices are low. Demand here may be similar or fall back slightly next year as a result, but Brazil is still expected to be one of the main import markets in 2025, and the outlook for price is generally rising unless weather or falling crop prices disrupt the main season. Chinese imports have risen again on the exceptionally high levels seen last year, averaging 1mn t/month after 10 months for the first time. Domestic demand has been good at lower prices, and China has also rebuilt stocks that were drawn down for spring ahead of next year's peak season. Competitive supply and stock build should limit price rises in the market even through spring.

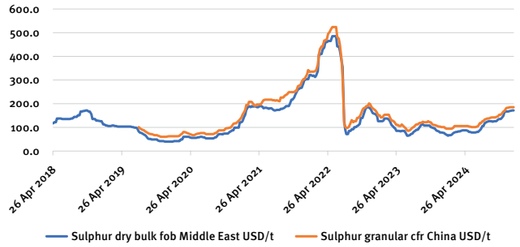
Demand in other Asian markets has also been rising this year, although not as far as China. Indian imports have risen after mid-year contract settlements, with good seasonal rainfall and lower prices supporting demand. Government support remains low, but fertilizer is more affordable this season with a lower contract, and India will look to agree a contract in 2025 with as low an increase from current levels as possible, although its negotiating position is likely to be less strong than China's. Rising CPO prices have supported demand in southeast Asia, and this should translate into rising prices in 2025, though Thailand and Vietnam will experience less of an increase due to stocks accumulated this year and demand affected by flooding. Demand elsewhere is more typical, though this presents something of a recovery after multiple years with buying affected by poor affordability. The US market has been stagnant since mid-year on low purchase levels. Rising prices in Brazil should bring some price support next year, although good product availability will temper price rises. The European market is retaining a premium to other granular regions, a situation which should hold in 2025 as supplies from Belarus and Russia remain limited. Prices may rise early in the year, ahead of spring demand, and then will remain flat through the summer. In the SOP market, tightness in supply is continuing to support prices and a wider than average premium for the specialty over MOP. Demand is healthy, although the high premium is deterring some buyers. The tight market situation is expected to continue into 2025, as Chinese exports may be further limited and European producers are still having some difficulties in procuring sulphur. This should support prices in the first half of the year.

SULPHUR

Restrictions on Chinese processed phosphate exports

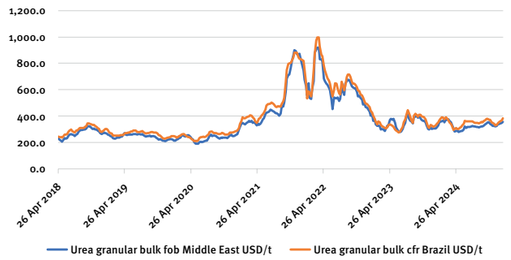
We expect global sulphur prices to remain firm to stable to the end of the year, before reaching a ceiling in January and then softening into the first quarter as the market stabilises. The recent firming has been supported by growing Indonesian demand, Middle Eastern producers setting high monthly prices with the expectation that buyers would accept the elevated prices, strong demand from key end-users and an increase in sulphur burning activity bringing pockets of additional demand. We expect these fundamentals to prop up pricing through the end of the year, as there is still demand from Indonesia, Morocco, China and the DRC. The price rise is encouraging competition between suppliers — higher offers are being made to Mediterranean producers, and imports from Kazakhstan continue to compete with Middle Eastern shipments into north Africa. Strong demand from key end-users has been a key factor in the latest price run, but once this demand has been met for end-of-year and January-arrival tonnes, pricing is expected to drop off through the end of January and into the second quarter. Morocco's OCP is still in the market for the ramp-up of its fourth quarter sulphur burner, combined with the burner that started up in the first half of the year, contributing to almost 1mn t of potential demand into 2025. Indonesia's QMB is also in the market for tonnes, with ramp-up of the PT New Energy HPAL Phase 2 nickel plant continuing. In Brazil an offer from CMOC at the high end was confirmed for January arrival, and South Africa's Foskor closed a tender at the high end for January arrival tonnes, pushing up pricing sentiment for market participants buying before the end of the year. There has been some supply side tightness contributing to lifting prices across November and December. There has been limited supply from Kazakhstan because of unscheduled repairs at the Tengiz oil field, and in Mexico as Pemex has cut operating rates at their six refineries and reduced capacity because of operating costs. Across the Mediterranean fires in

Sulphur historical pricing



Greece and Turkey have caused maintenances to refineries, decreasing sulphur quantities for December to lower levels than usual. In the Middle East, refinery maintenances have also driven the firming trend, with outages in Saudi Arabia, Iran, and Iraq in December. The softening we expect in January will be compounded by refineries coming out of maintenances as outages are resolved, and we expect a boost in sulphur recovery, improving availability. Firm but stable pricing is expected through December, with the Vancouver fob price being supported by Chinese and Indonesian demand, and some tightness as Vancouver suppliers are building up depleted port stocks from the strike action in November. The strikes have led some market participants to be cautious of booking tonnes out of Vancouver, and instead taking Middle Eastern tonnes, further supporting the elevated December price set by Middle Eastern producers. But into January as delays persist for railed and shipped product because of colder temperatures, the export forecast for Vancouver has been revised down, and we expect Vancouver fob pricing to ease in January to align with this. China was also in the market for restocking port inventories after a low buying month in November, which is supporting pricing to the end of the year, and a flurry of import demand is expected in late January which should keep pricing strong at the beginning of 2025. But Chinese DAP and MAP exports have been restricted from early December, which will contribute to price softening from January as demand from Chinese phosphate producers will decline, and may continue until the start of the second quarter. Trump's presidency will bring uncertainty to the outlook for North American pricing and supply dynamics when he is sworn in on 20 January. The potential impact of proposed 25% tariffs on sulphur trade to the US raises questions, though whether the tariffs will go ahead is yet to be determined. If they materialise, the tariffs are expected to raise costs or disrupt imports of Canadian sulphur next year, and also impact other downstream fertilizer products. Global sulphur pricing is expected to remain firm with fundamentals from November and end of year demand for tonnes keeping delivered price levels from dropping too low. Once refineries come back on line, January tonnes are secured, and supply side tightness eases, the market is expected to reach a peak and stabilise.

Urea historical pricing



NITROGEN/UREA

Imports slow to western Europe

Prices for urea fell below forecast levels due to a collapse in the week prior to India's 11 November tender. Cfr levels in Brazil dropped USD20/t when the amount imported in October– a record 1.2mn t – became known, and fears of oversupply mounted. Prices fell another USD20/t to around USD330/t cfr by the end of November. This dragged down the overall market, setting a bearish tone and encouraging traders to take short positions. Urea prices remain weak in the short term. Lack of support from Brazil will encourage suppliers to move urea to the US earlier than planned. European buyers are prioritising nitrate purchases. India is expected to tender again for January cargoes, but elsewhere there is little demand pull. There is also some length among certain suppliers for December loading: Russian producers appear long on granular urea, and more than 300,000t of Iranian appears uncommitted, although reports of production cuts may mitigate this. Bids for Iranian urea have fallen below USD290/t fob. India is expected to tender in mid-December to buy urea for shipment up to mid-January, with a requirement for up to 1mn t if product can be found at acceptable prices. This sizeable demand should stabilise prices in the international market once the cfr level is set, expected to support Middle East fob levels around USD330/t. As in the December tender, African suppliers should also feature, with India offering netbacks at least as high as Brazil. The timing of buying for spring in Europe and the US holds the key to when prices will turn up again. We are forecasting a spike in prices in February and early March, coinciding with the peak shipment period to these two markets, with Egyptian urea likely to reach USD370-380/t fob again. The weather will be the main determinant of when the pull from these markets begins. Gas prices are approaching USD15/mn Btu in northwest Europe for December and the first quarter 2025, equivalent to a urea production cost around USD420/t cfr ex-works. Imported urea is very competitive against this, and we forecast strong demand in the first quarter not only due to gas prices but also to demand deferral from the fourth quarter 2024. European producers may also curtail production once again. The US market should also see very high import demand in the first quarter. Year-to-date imports are estimated at 600 000-700,000t behind 2023. The fall in Brazilian prices means the US is a more attractive import destination than since July – Nola is trading at the equivalent of USD335-340/t cfr a premium of about USD5/t to Brazil cfr — so some of this shortfall could be recouped in December-January. Further ahead, the first quarter strengthening price is forecast to reverse in March-April, and result in prices falling towards USD300/t fob from most origins. The return of China to the export market is not expected before April 2025, and very possibly not before July. Our supply forecasts reflect this assumption. An earlier return to the market by Chinese suppliers would add to pressure on prices. The other political development that could affect the market in 2025 is an ending of the conflict in Ukraine. Whether president-elect Trump can live up to his claim to end the war quickly remains to be seen. But hopefully the conflict will come to a close in the coming year, which could see the re-emergence of Ukrainian urea on world markets, and a possible easing of sanctions on Russian producers. ■

Special focus

INFRASTRUCTURE AND LOGISTICS ›

Transforming fertilizer production

Genesis Fertilizers' low-carbon vision for Western Canada

Written by

Breanne Baker, *Director of Strategy and Communications,* ***Genesis Fertilizers, Canada***

Western Canada's farming sector, the backbone of its economy, is at a crossroads. Volatile fertilizer prices, heavy reliance on imports, and the urgent need for sustainable practices pose significant challenges for farmers striving to maintain profitable and environmentally responsible operations.

Recognizing the urgency of these issues, Genesis Fertilizers - a farmer-driven initiative - has taken a bold step to reshape the future of agriculture. The mission: proposing to construct Canada's first low-carbon nitrogen fertilizer facility, designed to stabilize supply, lower net operational costs for farmers, and reduce the carbon footprint of fertilizer production.

This multi-billion dollar proposed facility is more than an infrastructure investment. It represents a ground-breaking vision for agricultural sustainability, integrating advanced carbon capture technology and innovative production methods. Through strategic partnerships with global technology leaders including DL E&C, thyssenkrupp Uhde, thyssenkrupp Fertilizer Technology, Stamicarbon, and CARBONCO, Genesis Fertilizers is turning a bold idea into a reality—empowering farmers and setting a new standard for the industry.

Building a facility for the future

Belle Plaine, Saskatchewan, Canada, offers a unique confluence of resources and infrastructure, making it the perfect home for Genesis Fertilizers' proposed facility - a project that aims to transform agriculture in Western Canada. With strong regional demand for fertilizers, abundant natural resources, and robust transportation networks, the region provides all the ingredients for success.

Western Canada's natural advantages make it an ideal hub for nitrogen fertilizer production. Affordable natural gas powers the ammonia production process, a key step in creating high-quality nitrogen-based fertilizers. The region's reliable water resources ensure uninterrupted operations, while local energy infrastructure supports the electricity needs of advanced, energy-efficient production technologies.

An extensive transportation network - including CN and CPKC rail lines and the TransCanada Highway - enables seamless distribution to Canadian and US markets. These integrated advantages will allow Genesis Fertilizers to operate with efficiency and sustainability, directly benefiting Western Canadian farmers.

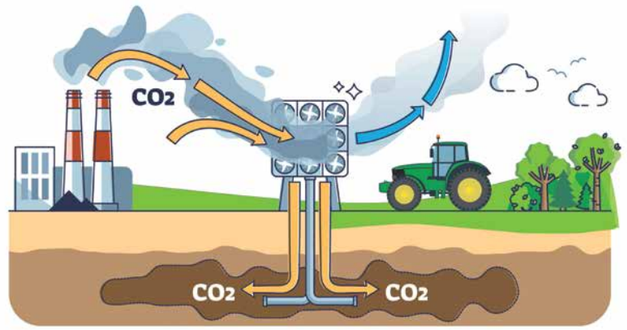
Facility highlights:

- Over a million tonnes of ammonia and nitrogen-based fertilizers, including urea, urea ammonium sulfate (UAS), and diesel exhaust fluid (DEF), based on current market mix expectations.
- Advanced carbon capture technology capable of sequestering up to 800,000 t of CO_2 annually, with plans to transport captured carbon to the Belle Plaine carbon hub.

For farmers, this facility represents more than just a reliable fertilizer source - it is a game-changer. A consistent fertilizer source will help farmers navigate market fluctuations, reduce their net operational costs and boost productivity and profitability. Most importantly, as a farmer-owned initiative, profits, including from reduced freight and import costs versus comparable fertilizer sources, flow directly back to the people who matter most - farmer-owners themselves.

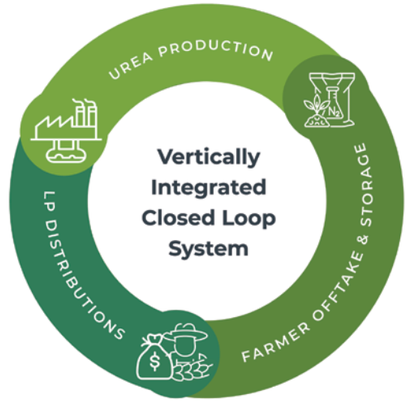
Western Canadian farmers, long burdened by volatile prices and unreliable supply chains, see Genesis Fertilizers as a beacon of hope. As one farmer shares: "This proposed facility gives farmers like me a sense of ownership and security. We're not just buying fertilizer anymore - we're part of a movement to bring reliability and stability to our operations."

Figure 1. Innovative carbon capture for a sustainable future. The proposed Genesis Fertilizers facility will integrate cutting-edge carbon capture technology, reducing CO_2 emissions and supporting cleaner, greener agriculture for Western Canadian farmers



Having a stake in a fertilizer facility means we're not just consumers

Figure 2. A farmer-centred closed loop system. The Genesis Fertilizers model creates a seamless cycle - urea production and distribution - ensuring farmers benefit directly from ownership, efficiency, and long-term sustainability



Another farmer emphasized the value of ownership: "Having a stake in a fertilizer facility means we're not just consumers. We're investors in our future, and that changes everything."

These voices reflect the excitement and hope surrounding the Genesis Fertilizers proposed facility, which aims to address the core challenges farmers face.

From vision to reality: The roadmap to a sustainable future

Planning, financing and constructing a facility of this scale is no small feat. It demands meticulous planning, global collaboration, and a phased approach rooted in innovation. Genesis Fertilizers' detailed roadmap highlights its unwavering commitment to transforming this ambitious vision into reality. The roadmap:

1. Initial feasibility study: Comprehensive research identified Belle Plaine, Saskatchewan, as the ideal site. Factors such as resource availability, market demand, and logistics cemented the location's potential.

2. Front-end engineering design (FEED): Genesis has engaged DL E&C to establish the technical blueprint for the facility. This phase includes cost estimates, timelines, and design details. DL E&C's global expertise ensures the proposed facility meets world-class standards.

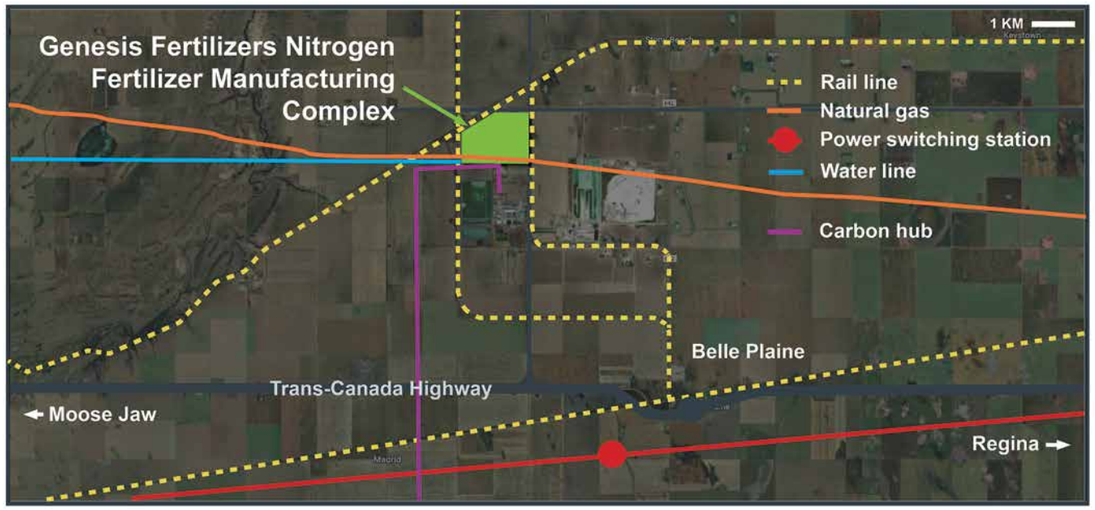
3. License & PDP agreements: Genesis secured partnerships with industry leaders to integrate advanced technologies:

- thyssenkrupp Uhde: Global leader in ammonia technology, supplying advanced equipment for high-efficiency nitrogen synthesis.
- thyssenkrupp Fertilizer Technology: Experts in fluid bed urea granulation, optimizing fertilizer quality and production.
- Stamicarbon: With over 75 years of expertise, offering state-of-the-art solutions for efficient urea production and maintenance.
- CARBONCO: World-class leader implementing carbon capturing systems for CO_2 sequestration.

4. Site preparation and infrastructure: Comprehensive geotechnical and topographic surveys have been completed, providing critical data for the structural design of the site. Existing service lines beneath the Genesis property have been identified, and plans are in place to reroute pipelines promptly to enable site construction. Excavation, pipeline installation, and foundation work pave the way for key structures, such as ammonia units and storage tanks.

5. Construction and commissioning: PCL Construction, in collaboration with DL E&C, is set to oversee the assembly of key structures, with operations slated to commence by 2029.

Figure 3. A Prime Industrial Hub. Belle Plaine, Saskatchewan, is home to the future Genesis Fertilizers Nitrogen Complex. Its strategic proximity to key infrastructure—rail lines, natural gas, and power switching stations—makes it a hub for sustainable fertilizer production supporting Western Canadian agriculture



Milestones achieved

Genesis Fertilizers has already made significant progress, achieving critical milestones:

- Secured Belle Plaine, Saskatchewan, as the ideal site for the facility.
- Received endorsements from the Saskatchewan government, reflecting the proposed facility's importance to regional economic growth.
- Engaged PwC to oversee funding and government incentives, ensuring robust financial management.
- Awarded CARBONCO as the carbon capture and storage (CCS) technology provider
- Signed an MOU with Whitecap Resources Inc. to integrate cutting-edge carbon capture systems.
- Partnered with DL E&C to define the proposed facility's scope and technical designs.

These milestones underscore Genesis Fertilizers' commitment to transparency, collaboration, and environmental stewardship, setting the stage for the next phases of the proposed facility.

Sustainability: The foundation of innovation

At every stage of the proposed facility, Genesis Fertilizers has made sustainability a cornerstone of its vision. By prioritizing environmentally responsible practices, the facility will not only reduce its carbon footprint but also empower farmers to embrace sustainable agriculture:

Carbon capture: Advanced systems designed to sequester up to 800,000 metric tonnes of CO_2 annually, making Genesis Fertilizers a significant contributor to Canada's national climate goals.

Efficient production systems: State-of-the-art technologies from thyssenkrupp and Stamicarbon minimize emissions and waste, ensuring the facility operates at world-class environmental standards.

Empowering farmers: Low-carbon fertilizers will enable farmers to reduce their environmental impact, reduce their net operational costs, and sustain high yield potential while meeting market and regulatory expectations for sustainable practices.

These sustainability initiatives not only position Genesis Fertilizers as an environmental leader but also ensure long-term benefits for farmers, the industry, and the planet.

The road ahead

With sustainability and innovation at its core, Genesis Fertilizers is poised to achieve several critical milestones that will bring its vision to life:

- ***2024-2026:*** Finalizing technical designs, securing permits, and preparing the site for construction.
- ***2027-2028:*** Developing seven farmer-focused SuperCentres and integrating advanced technologies to power efficient operations. These state-of-the-art SuperCentres are proposed to be strategically located across Western Canada, designed to source, store, blend, and distribute fertilizers directly to farmers. Utilizing advanced technology and automation, these facilities aim to minimize load and unload times, ensuring high-quality products and exceptional blending capabilities at industry-leading speeds.
- ***2029:*** Commissioning the facility and transitioning to full-scale production, delivering sustainable, locally produced fertilizers to farmers across Western Canada.

These milestones represent the next steps in realizing a project that will not only benefit individual farmers but also strengthen Canada's agricultural infrastructure and sustainability leadership. Through strategic planning and ongoing engagement with farmers, Genesis Fertilizers is on track to deliver transformative benefits to the agricultural sector.

Economic impact: building Canada's agricultural backbone

Genesis Fertilizers' proposed facility is more than a local project - it is an economic engine poised to drive growth across Saskatchewan and beyond. By supporting local suppliers, transportation providers, and contractors, the proposed facility aims to foster economic resilience and empower communities, reinforcing the region's position as a hub for sustainable agriculture. The key economic benefits include:

- The facility will generate over 1,500 construction jobs and 180 permanent operational roles, delivering significant employment opportunities that will energize local economies and provide long-term stability for Saskatchewan's workforce.
- The construction and operation of the facility will directly support regional suppliers, contractors, and service providers, creating a ripple effect of economic activity that invigorates businesses and spurs growth across the province.
- By stabilizing fertilizer supply and reducing reliance on volatile global markets, Genesis Fertilizers aims to give farmers the tools to plan with confidence, strengthening their economic resilience and safeguarding their livelihoods.

Jason Mann, CEO of Genesis Fertilizers, highlights the broader mission: "This proposed project is more than a facility - it's an investment in the future of Canadian agriculture. By creating jobs, driving local economic growth, and empowering farmers, we're building a stronger, more sustainable agricultural sector."

Why the vertically integrated farmer-owned model matters

Genesis Fertilizers is redefining agricultural business by adopting a vertically integrated, farmer-owned structure. This model empowers farmers by giving them a direct stake in the facility's success, ensuring that decisions align with their needs and priorities. Unlike traditional fertilizer companies, margins from the Genesis facility flow directly back to farmer-owners. This strengthens their economic position, enabling greater reinvestment in farms and rural communities. In addition, by prioritizing local production, the facility reduces emissions associated with imports, aligning with farmers' sustainability goals and Canada's climate commitments.

Farmer involvement ensures that Genesis Fertilizers stays focused on solving real agricultural challenges. One farmer-owner explains: "It's empowering to know that decisions about the facility are being made with farmers at the table. This isn't just about fertilizer - it's about the future of agriculture."

This unique ownership structure, combined with Genesis Fertilizers' proposed state-of-the-art facility and sustainability practices, positions the project as a bold step forward. With world-class partnerships and cutting-edge technologies, Genesis Fertilizers is not just proposing to build a facility—it's proposing to build a future. For farmers, stakeholders, and the agricultural community, this proposed facility symbolizes the power of collaboration and innovation.

Strategic importance for Canada

The benefits of the Genesis Fertilizers facility extend far beyond Saskatchewan. This proposed facility positions Canada as a leader in sustainable agriculture and reinforces its economic and environmental resilience on a global scale.

By producing a reliable local fertilizer supply, Genesis Fertilizers will ensure that Canadian farmers can meet the demands of a growing population while supporting global food security. It will also reduce dependence on imported fertilizers shields Canada from geopolitical risks and market disruptions, strengthening its economic autonomy.

In addition, by sequestering up to 800,000 t of CO_2 annually, Genesis Fertilizers supports Canada's commitment to reducing greenhouse gas emissions in line with the Paris Accord, setting a new standard for sustainable agriculture. ■

This isn't just about fertilizer - it's about the future of agriculture

The Fertiliser Industry Assurance Scheme

Fertilizer Focus speaks with Roberta Reeve, Technical Manager at the Agricultural Industries Confederation (AIC) about the Fertiliser Industry Assurance Scheme (FIAS) - how it benefits the industry and protects the public

Fertilizer Focus (FF): Why was the Fertiliser Industry Assurance Scheme developed?

Roberta Reeve (RR): Initially it was developed to reduce the risk of fertilizers being misused, for example, in the terrorist attacks in the UK in the 1980s and 90s or handled incorrectly causing risks of incidents or explosions caused by poor storage practices. At the time the ways to address this included introducing legislation to control which fertilizers could be used or to actually ban some types of fertilizers - particularly ammonium nitrate. This would have been very restrictive on both the fertilizer industry and on the options available to farmers' growing plans. So at the end the option of self-regulation by the fertilizer industry was considered the best option and that became the FIAS assurance scheme. With due diligence and product stewardship this was developed as a joint exercise with the UK government and the fertilizer industry and other shareholders. The AIC then came into manage that system because it had previously operated similar assurance schemes. The FIAS was eventually launched in 2006.

FF: What are the key aims of the scheme?

RR: So the key aims really are to manage the security, safety and traceability of fertilizers within the UK supply chain. It also provides a framework for a 'work to improve' approach. Another aim at the time was to achieve traceability throughout the supply chain which has been accomplished now and covers from the arrival of fertilizer materials at UK ports, right up to delivery to the user farms.

FF: Could you explain the structure of FIAS?

RR: It's managed by a steering group which is made up of industry, government and non-industry stakeholders that basically directs the strategy of the scheme. And then we have a working group of industry technical specialists and they look at the practical application of the scheme and that includes producing the FIAS standard. The AIC's role is actually to manage and facilitate that whole process. To actually implement this scheme we have a certification body which trains auditors and carries out audits for the participants of the scheme.

FF: How does FIAS work?

RR: There is a FIAS standard and that document provides a set of criteria which meet the aims of the scheme. When participants join, those businesses are audited annually for compliance to that standard and if they're successful then they receive a certificate. A big part of the scheme is risk assessment - every participant is required to carry out a risk assessment for their business whatever fertilizer products they handle.

FF: What elements of the fertilizer supply chain can the certification be applied to?

RR: The FIAS applies to all elements of the supply chain right from arrival in the UK up to delivery to the end user. So that covers stages from shipping, manufacturing, storage, transport, sales and delivery. It also it applies to all fertilizer types – so it could be solid, liquid, high nitrogen, low nitrogen– anything that is defined as a fertilizer used in all areas of agriculture, horticulture, forestry and amenity use Home and garden use are excluded.

FF: How does the FIAS provide confidence to the market, government and the public?

RR: FIAS helps implement and raise best practice standards throughout fertilizer industry and a key part of that is the risk assessment which relates to security and safety of the particular products handled by each business. That ensures that basically all the elements of handling, storage and transport are considered across businesses of all sizes.

In addition to that there are controls on the selling of fertilizers to make sure that they are sold only to bona fide professional users. It provides confidence and works closely with UK authorities through its government departments such as Defra and the Home Office to ensure that standards are maintained. I suppose the best example really is the Beirut explosion, following that the public in the UK were obviously concerned because they knew we have ports and manufacturing sites where fertilizer is stored and handled and we were able to reassure that those stores are regularly checked and audited. Those businesses, as well complying with FIAS, are also complying with other legislation. These controls and self-regulation in place for the industry very much acted to reassure people following that explosion.

FF: Who is involved with the FIAS? And who benefits from it?

RR: As well as government stakeholders and the industry, others includes representatives of farming, road haulage bodies. On the industry side there is a wide scope of businesses involved in FIAS - it could be anything from a single operator business owner such as a driver with one lorry to operate or a stand alone merchant and then all the way up to owners of large distributors and manufacturing sites.

Figure 1. The FIAS assured fertilizer supply chain

In terms of who benefits from it, the authorities do, because they know they can rely on FIAS to maintain and implement the standards. Participants benefit because they have support with business assistance to achieve best practice. For hauliers, we have an earned recognition scheme with the Department of Transport. Also for participants, it means they're part of a register of certificated companies which allows them to provide a trusted service to their customers - so again it's about ensuring the whole supply chain is covered. The public benefit in knowing that safe, secure and traceable systems exist.

FF: How is the FIAS scheme and the AIC monitored?

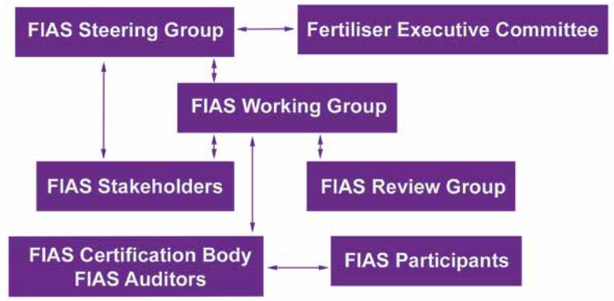
RR: The scheme is applied in practice by a certification body that AIC appoints. They are appointed by tender and accredited by UKAS (United Kingdom Accreditation Service).

Currently this is a company called Kiwa Agri Food, who have in fact been involved with FIAS from its inception. They are audited by UKAS on a regular basis. A as they hold a contract with AIC, we set KPIs and also audit them annually to make sure standards are maintained. The certification body collects data from the audits and all of that data is reported back to the FIAS steering and working groups and used to ensure the scheme is working correctly and develop it further.

FF: What are the key challenges that the Agricultural Industries Confederation (AIC) faces with FIAS?

RR: There are probably two main challenges and the first one is 'change'. Change in any situation is inevitable and

Figure 2. The structure of FIAS



in the fertilizer industry there have been a lot of changes to markets, technology and legislation both UK and European. So keeping up with those and making sure that FIAS is evolving and remains relevant and good value is a challenge.

The second one I think is complacency. Just because there's been no major incidents, be it terrorist or safety incidents in the UK, doesn't mean that those threats have gone away. It just means the threats are controlled so we need to keep raising awareness of the role that FIAS is playing.

FF: What developments of FIAS are in the pipeline? And how do participants stay updated?

RR: We are just about to start a review of the FIAS standard document and that will start in early 2025 and will take about 18 months to two years to complete and issue the next version.

In terms of the participant support we've got updated training coming out for participants in early 2025 called FIAS iLearning.

FF: Is that course mandatory for participants?

RR: Yes, it is currently mandatory for one person from each company, but it is available to all participants. In terms of communications we have the FIAS web page (see below) which has regular updates and a newsletter twice a year which covers current issues directly related to this scheme as well as wider topics such as cyber security. We issue briefings to participants about any changes to the scheme or legislation updates. We also have various points of contact for participants either at the certification body or directly with me at the AIC.

FF: What other assurance schemes does the AIC manage?

RR: Yes there are four others. Three of those are related to animal feed and crops. These are UFAS which is the Universal Feed Assurance Scheme, FEMAS the Feed Material Assurance Scheme and TASCC the Trade Assurance Scheme for Combinable Crops. There is also ESTA, the European Seed Treatment Assurance scheme.

In 2025 a new scheme is being launched in 2025 which is ASCS – AIC Sustainable Commodities Scheme.

For more information on FIAS please visit: ***https://www.agindustries.org.uk/sectors/trade-assurance-schemes/fias-fertilizer-industry-assurance-scheme.html*** ■

Nutrien Ag Solutions confirms AUD70 million fertilizer centre for Western Australia

Written by

Lucy Brennan, *Head of Communications,* ***Nutrien Ag Solutions, Australia***

Nutrien Ag Solutions has commenced work on a new modern and efficient bulk fertilizer distribution centre in Western Australia (WA) that will serve farmers and enable food production for WA and export.

The significant AUD70 million investment decision comes just a year after the company's Kwinana Jetty facility was impacted by fire.

Nutrien Ag Solutions Managing Director, Mr Kelly Freeman, said Nutrien will continue to supply farmers with fertilizer from its existing Kwinana site throughout the 2025 season prior to the new East Rockingham facility becoming operational in 2026.

"Nutrien understands the importance of having safe, efficient, and reliable supply chains and that requires investment in essential infrastructure like the new 130,000 tonne facility we've announced today," Mr Freeman said.

"WA is very important to Nutrien and our dealings here with the State Government, authorities and thousands of farmers have given us the confidence to make this significant investment into WA agriculture. We have also worked hard to make sure that we can continue to supply farmers while the new facility is being built.

"Nutrien's investment is a continuation of our commitment to the Australian market and our desire to create a more robust supply chain to mitigate risks and support the economic stability of Western Australia's AUD16 billion agricultural industry.

"This bigger, more efficient facility not only strengthens Nutrien's capability to serve farmers but also reinforces Western Australia's role as a key agricultural hub for food production and exports."

(left and above) Concept drawings. *Credit: Birchmead*

Important commitment

The new site, just two kilometres from its current facility, will feature three undercover outloads, more slots for storage, twin blending lines, pits and wheel washers on site for trucks. It will have new dedicated loading equipment with improved loading systems. These systems will allow improved loading speeds and operating conditions for both site personnel and the customers trucks being loaded. It will also have an office for 30 people.

WA premier, Roger Cook, commented on the project: "Living in Kwinana, I know how important our major industrial area is, not only for jobs in the local community, but for our entire State economy. Following the fire at Nutrien Ag Solution's existing facility earlier this year, this AUD70 million investment in a larger, state-of-the-art distribution centre is an important commitment to WA and Perth's southern suburbs. This is also a big vote of confidence in the long-term future of WA's agriculture sector and our State's role as a key agricultural hub for food production and exports. My Government is committed to locking in quality local jobs and a strong economy for the long term, and is working to futureproof Perth's major industrial precinct with AUD20 million to expand capacity at the Kwinana Bulk Jetty precinct and other investments."

(left to right) Nutrien Ag Solutions West Region Director,Andrew Duperouzel; CFC Group & Birchmead Executive Chairman, Philip Cardaci; Nutrien Ag Solutions Managing Director, Kelly Freeman

Optimising yields

Nutrien Ag Solutions West Region Director Andrew Duperouzel said the new facility, being developed by West Australian company Birchmead, will feature state of the art equipment and be purpose-built to maximise efficiency.

"Granular fertilizer is a key input for farmers who need to apply it at the right time to maximise their crops, so ready access at the right time is critical. Our investment will mean more fertilizer can be stored and more efficiently blended and loaded out to farmers," Mr Duperouzel said.

"The new facility means we will have approximately 20% more bulk fertilizer storage for WA which adds certainty of supply for farmers in an environment where global supply chain issues are one of their greatest risks."

"We see ourselves as partners to WA farmers. This investment seeks to support our farmers and the many communities that rely on farming across the State."

The new distribution centre will complement Nutrien's other WA facilities which include a liquid fertilizer manufacturing plant, research facilities and more than 70 stores throughout metropolitan and regional WA, servicing thousands of farmers. Nutrien employs almost 600 West Australians and 120 contractors. Agriculture and Food Minister, Jackie Jarvis, expressed her enthusiasm for the new facility:

"This new facility increases Nutrien Ag Solutions capacity, securing supply so that farmers can access fertilizer at the right time to optimise yields. WA's agricultural sector is integral to our State's economy and a key industry in the Cook Labor Government's plan to Diversify WA. I welcome this significant investment by Nutrien Ag Solutions that will support our farmers to remain internationally competitive, drive economic growth and create local jobs." ■

Conference preview:

Argus Clean Ammonia India, Middle East and Africa 2025

3-5 February 2025 • Dusit Thani Abu Dhabi, United Arab Emirates

Connecting industry leaders in India, Middle East and Africa to global clean ammonia markets

The Argus Clean Ammonia India, Middle East and Africa Conference is returning to Abu Dhabi, United Arab Emirates, on 3-5 February 2025, with an expanded regional scope, bringing together participants from across India, Middle East and Africa for clean hydrogen and ammonia. Join the wider ammonia value chain including, technology providers, storage providers, shipowners, utilities, fertilizers, and other hard-to-abate sectors.

Industry leading speakers

With industry-leading speakers, topics covered will include regional highlights on critical issues including strategy and policy frameworks, financing projects, carbon capture and management as well as consumer perspectives and updates on key demand-side policies from the EU, South Korea and Japan. Confirmed speakers include:

- Navid Ostadian-Binai, Head of Green Vessels and Fuels, ***Maersk Tankers***
- Mirjam Peters, Chief Customer Sustainability Officer, ***Hoegh***
- Syed Arsal Ahmed, Senior Vice President, ***HSBC Infrastructure Finance***
- Aslam Moola, General Manager & Venture Director, ***Vopak RHQ & SABTANK***
- Harish Jayaram, Vice President, Business Development, ***Hygenco Green Energies***
- Saravanan Manivel, Head of Low Carbon Fuels, ***Engie***
- Vibeke Rasmussen, SVP Product Management and Certification, ***Yara Clean Ammonia***

Hydrogen Focus Day – add on!

New for this year, join Hydrogen Focus Day, providing participants with the opportunity to network across the full hydrogen and derivative value chain. Gain insights into alternative derivatives to ammonia and the key developments taking place in the wider hydrogen market, including methanol, eSAF and eFuels.

With a more focused group of attendees, you can network and gain the expertise you need from like-minded individuals and identify areas for business opportunity synergies.

Hear from leading speakers from across the hydrogen value chain, including government, key sectors such as steelmakers and refiners from across India, the Middle East and Africa, as well as key enablers from across the value chain for hydrogen and derivatives. This is one not to miss. For only USD899 make the most of this dedicated add-on. Dedicated Hydrogen Focus Day speakers include:

- Naveen Ahlawat, Head of Power to X; Green Hydrogen, Green Steel Gasification projects & CCSU, ***Jindal Steel Ltd***
- Bakul Pant, Chief Commercial Officer, ***Occior Energy***
- David Smith, Executive Vice President, ***Marubeni Middle East and Africa Power***
- Ghassan Wakim, Technology Director, Zero-Carbon Fuels, ***Clean Air Task Force (CATF)***
- Tim Hard, SVP Energy Transition, ***Argus***

Network and develop partnerships in India, Middle East and Africa, bridging with the rest of the world.

With 150+ attendees from 100+ companies and 25+ companies, make the most of the opportunity to network and plan your business strategy at the highest level in the region for clean ammonia. Networking activities include:

Buyers and sellers roundtable and speed-networking breakfast - As more projects near final Investment decisions (FIDs), and the market gains more momentum, it is critical for buyers and sellers of clean ammonia to meet. Structured around key offtake markets, expect will include roundtables focused on the following markets: chemical and industrial clusters in the UAE, fertilizers: decarbonising global food chains, shipping and maritime: shipowners, brokers and charterers, power generation in Asia: Singapore, Japan and South Korea and many more.

Closed-door Indian clean ammonia procurement forum and closed-door financing African ammonia projects forum - Do you have a particular interest in either the India or African clean ammonia market? Take this opportunity to join these discussions centred around critical topics, meet with like-minded individuals and tailor your networking time based on your markets of interest. Open to all attendees, find out more on the agenda to sign up.

Extended opportunities for networking - Maximise your informal networking time during our breakfasts, breaks, roundtables and drinks receptions, and design your agenda to make the most of your event experience.

Argus conferences app - Registered attendees will have access to our exclusive networking app, allowing you to view who else is attending the event and schedule meetings easily and efficiently ahead of the conference. Keep track of your schedule and set reminders for the sessions of the conference you do not want to miss out on. ■

Thank you to our sponsors

Platinum sponsor

Linde

Gold sponsor

Yara Clean Ammonia

Sponsor

HYGENCO

*Contact us at **sponsorship@argusmedia.com** to find out more about sponsorship opportunities*

People and events

Brazil Potash further strengthens Board of Directors with appointment of Christian Joerg

Brazil Potash Corp. - a company developing and constructing the largest potash fertilizer project in Brazil - has announced the appointment of Christian Joerg to its Board of Directors, effective immediately. Mr. Joerg brings over three decades of leadership in agricultural commodities, international trade, agriculture finance, and food security throughout Africa and the Middle East.

“Christian's appointment strengthens our Board as we progress construction of the Autazes Potash Project. His deep industry expertise in global agricultural markets and extensive relationships in the Middle East will significantly contribute to our future success. His proven record of successfully building and managing global agricultural businesses, combined with his experience in trade finance and risk management, will be instrumental in helping guide Brazil Potash's strategic growth,” said Mayo Schmidt, Executive Chairman of Brazil Potash.

Mr. Joerg is Chief Executive Officer of VA Intertrading Aktiengesellschaft (VAIT), Austria's leading trading company. Most recently, Mr. Joerg served as Vice President, Trade, SALIC (Saudi Agricultural and Livestock Investment Company) and was previously head of Agriculture Supply Chain Investments and Portfolio Management responsible for the development and execution of Saudi Arabia’s global food security strategy. Previously, Mr. Joerg served as CEO of MAG Commodities (2013-2016), Vice President and Managing Director for Viterra's Europe, Middle East and Africa operations (2008-2013), Executive Director of Commodity Trade Finance at UBS (2005-2008), and Vice President and Managing Director of Collateral Management at SGS (1998-2005).

Mr. Joerg holds degrees from Dr. Räbers Business College in Zürich and the Agricultural College Strickhof. He is multilingual, speaking German, English, French, and Dutch.

ATOME appoints construction engineer for Paraguay green fertilizer project

ATOME PLC, a green fertiliser project developer, ATOME has appointed Sam Mackilligan as its head of engineering and project management for its 145-megawatt Villeta project in Paraguay, set to become the world’s largest dedicated green fertiliser facility.

Mackilligan, with over 35 years in infrastructure and energy projects, brings experience from his recent role as hydrogen director for Europe at engineering firm AECOM. His background with major projects positions him to support Villeta’s ambitious goals in advancing green fertiliser production.

"We are pleased to welcome Sam into his capacity as our Head of Engineering and Project Management as we progress to the next stages of the project engineering," said Mussat.

EBIC elects new board

EBIC held its extraordinary end-of-the-year General Assembly in December 2024 via Zoom, where online remote voting results were announced, including changes to the Board. Several positions were open for the EBIC Board. The field was particularly competitive this year, with six excellent candidates for only three open Director-at-Large (DAL) seats.

The following Board members have been re-elected in the same position for a second term of another two years:

- Arne Pingel, Rovensa Next, President
- Carlos Rodríguez-Villa Förster, AlgaEnergy, Vice-President

The following Board members have been elected into new positions:

- David Hiltz, Acadian Plant Health, Treasurer (1st term) (previous DAL 2021-2024)
- Massimo Toni, Agronutrition, Director-at-Large (2nd term) (DAL 2018-2020 and Treasurer 2020-2024)

The following individuals have been elected:

- Antonis Angeletakis, Yara International, Director-at-Large (1st term)
- Marco Rosso, Syngenta Biologicals, Director-at-Large (1st term)

Alice Toderi, Hello Nature, is still in her 1st term as Director-at-Large (Nov. 2023-Nov. 2025).

EBIC extends its thanks to the three other DAL candidates, Thomas Leppin, Jerôme Grislain and Mark Palmer for their willingness to volunteer their talents, time, and energy to the association, with a special thank you to Thomas who has served two years as DAL in the Board.

Brazil's Agrogalaxy appoints new financial director

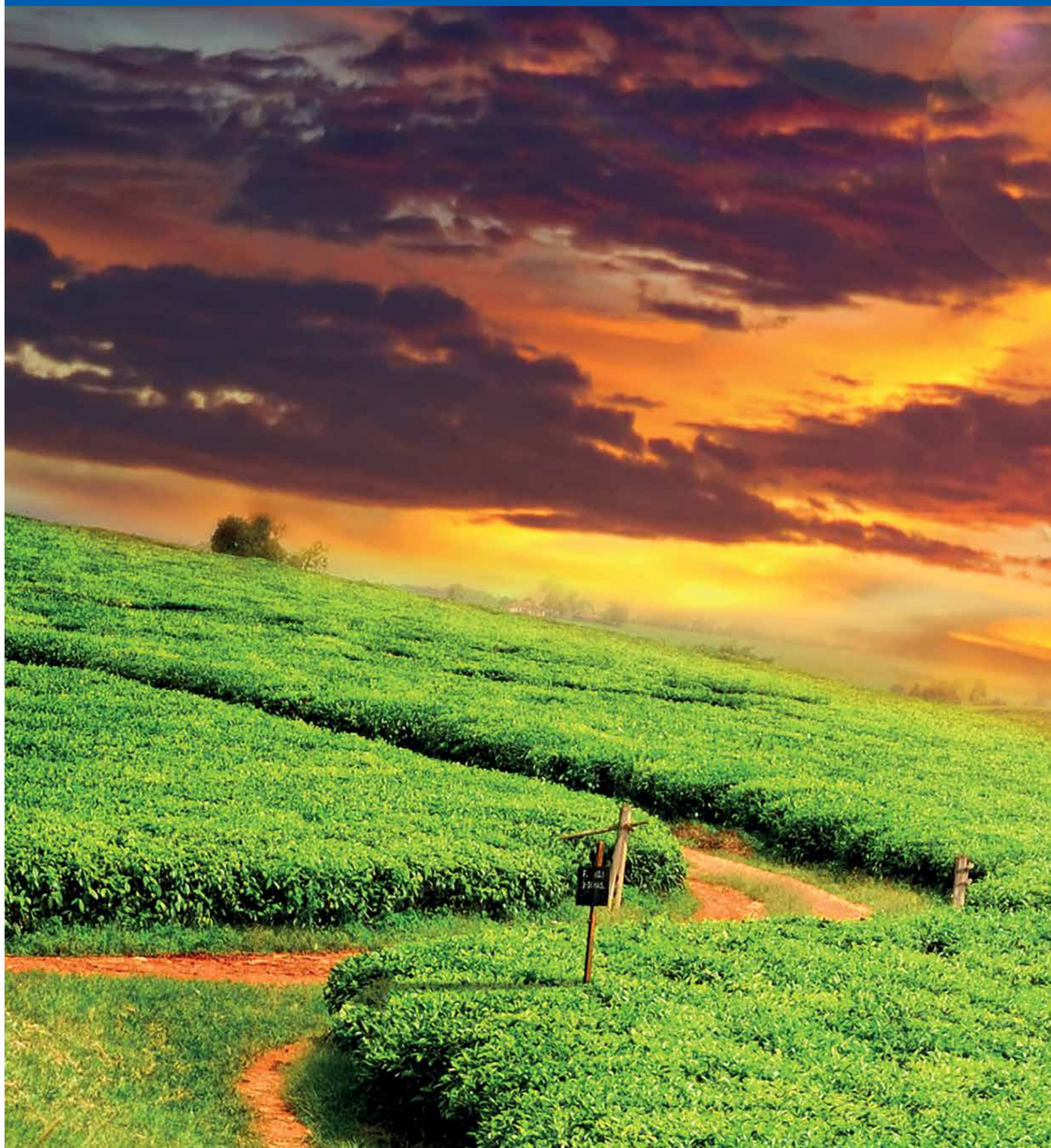
Brazilian agricultural inputs distributor Agrogalaxy made changes to its board of directors, appointing a new financial and investor relations director. Marcelo Ematne Amaral resigned from his position on 9 December and was replaced by Luiz Conrado dos Santos Carvalho Sundfeld, the company said.

Agrogalaxy is facing a judicial recovery process. Goias state civil court granted bankruptcy protection to the company and its subsidiaries on 1 October, which has debts to Brazilian creditors totaling around BRL3.7bn (USD611mn). The firm also owes USD160mn to international creditors, it said. The judicial reorganization plan was filed on 2 December to Goias state's court.

Agrogalaxy sells agricultural inputs such as fertilizer and seeds. It also provides other agricultural services such as origination and storage. ■

Supplement

AFRICA ›



The Africa Fertilizer Financing Mechanism

Driving impact, renewing mandate, and scaling up

Written by

Marie Claire Kalihangabo, *Coordinator of the Africa Fertilizer Financing Mechanism,*
African Development Bank

The Africa Fertilizer Financing Mechanism (AFFM) trade credit guarantee project in Tanzania has encouraged suppliers and agro-dealers to sign agribusiness partnership contracts, paving the way to stronger relationships throughout the agricultural value chain. Under the scheme, more than 57,000 t of fertilizer worth USD26 mn have been traded.

Since the inception of the AFFM has changed the lives of farmers across the continent. It has sought to address the critical challenge of fertilizer access, a cornerstone for unlocking Africa's agricultural potential and ensuring food security for millions.

The story of the AFFM is a tale of vision, resilience, and growth. From its humble beginnings to its current pivotal role in Africa's agricultural landscape, it has consistently worked to address one of the continent's most pressing challenges: access to affordable and high-quality fertilizer. With a renewed mandate and a growing impact, the AFFM is poised for even greater strides as it transitions into its next chapter: AFFM 2.0.

The genesis of the Africa Fertilizer Financing Mechanism

The origins of the AFFM can be traced back to the 2006 African Green Revolution Summit in Abuja, Nigeria. During the summit, African Union member states recognized the need for a dedicated mechanism to address the critical challenge of fertilizer access. Fertilizer, a cornerstone of agricultural productivity, has long been hindered in Africa by high costs, weak supply chains, and limited financing options.

Initially, progress was slow. A critical funding threshold of USD10 mn was not reached until 2015, delaying the Mechanism's launch. However, managed by the African Development Bank (AfDB), the AFFM became fully operational in 2018 with a clear mission: to deliver innovative financing solutions that would accelerate fertilizer use, boost productivity, and transform Africa's agricultural sector.

Here in Mafinga, 85% of the people are farmers. But the big challenge is the lack of farm inputs, particularly fertilizers. So, I started my business with small capital. But when I tried to reach out to different fertilizer suppliers, they could not support me. Due to my small capital, they did not trust me.

Fideline Mahenge, an agricultural inputs distributor in Mafinga, in the Iringa Region of Tanzania

Fertilizer Trade Credit Guarantee Project: A farmer walking through her field of cabbages holding a bag of Yara fertilizer in Mafinga, Tanzania

In its early years, AFFM concentrated on strengthening the fertilizer industry through trade credit guarantees. This strategy enabled suppliers to extend credit to distributors and farmers while reducing their financial risk. The approach was innovative, showcasing the power of de-risking investments in fertilizer supply chains to unlock growth and opportunity.

Nearly two decades later, AFFM has grown into a transformative force within Africa's agricultural landscape. It has empowered farmers, spurred growth, and addressed persistent financing challenges in the fertilizer supply chain. The Mechanism's journey has been marked by significant successes, valuable lessons, and bold ambitions for the future.

Pioneering solutions and achievements

By 2019, the AFFM had launched its first projects, laying the groundwork for sustainable fertilizer access. These projects introduced trade credit guarantees that allowed fertilizer suppliers to provide inputs to distributors and farmers on credit while mitigating financial risks. Over the years, the AFFM has expanded its reach and impact:

- ***Countries benefited:*** Implemented projects in six countries, including Côte d'Ivoire, Ghana, Kenya, Nigeria, Tanzania, and Zimbabwe.
- ***Farmers reached:*** Over 697,986 farmers, including 43% women, have accessed fertilizers.
- ***Fertilizer distributed:*** Enabled the supply of over 115,578 t of fertilizers.
- ***Capacity building:*** Provided training to more than 122,042 farmers on best agricultural practices.
- ***Financing enabled:*** invested USD13.1 mn in guarantees and USD1.2 mn in grants.
- ***Access to financing:*** Fourteen input suppliers participated in the credit facility, and enabled access to financing to 83 hub agro-dealers while 1,726 retail agro-dealers have been successfully linked to the supported hub agro-dealers.
- ***The impact has been profound.*** Farmers have seen their yields increase by as much as 30%, improving food security and income for their families and communities.

Scaling heights: A journey of growth

From a modest start, the AFFM has grown significantly, expanding its reach and portfolio. By 2024, AFFM's total funding had surged to USD38.7 mn, from USD15 mn in 2017, reflecting the trust and confidence it has garnered from stakeholders.

In 2024, the AFFM expanded its trade credit guarantee projects Uganda Mozambique, Guinea and Sierra Leone with an additional USD11 mn credit guarantee and USD1.72 mn grant.

By 2027, these projects aim to provide access to 140,000 t of fertilizer, benefiting over 1.1 mn farmers. At least 40% of these beneficiaries will be women, and training programmes will empower 125,000 farmers with knowledge on sustainable practices. The expected yield increases of up to 30% will drive food security and economic resilience across the continent.

Recognizing the importance of sustainable farming, the projects integrated soil health initiatives alongside fertilizer distribution.

Enhancing policy reforms and financing for fertilizer development in Africa

One of the AFFM's mandates is to support the development of effective policy reforms to enhance fertilizer production, trade, and utilization. The AFFM has contributed to this goal by developing three policy briefs and supporting 13 initiatives aimed at improving regional integration, harmonizing policies, and strengthening fertilizer financing mechanisms.

The AFFM's continental and regional fertilizer financing forums have emerged as impactful and distinctive events within the African context. These forums have provided valuable platforms for knowledge sharing, collaboration, and networking among diverse stakeholders, focusing on critical financing issues in the fertilizer sector. By raising stakeholder awareness of key challenges and opportunities, these forums have laid a strong foundation for driving necessary policy reforms and creating an enabling environment to attract investments in Africa's fertilizer sector.

Papo Delphine, a cocoa farmer in her plantation in Watte village, San Pedro, Côte d'Ivoire

Comparing how I applied fertilizer today to my old method is like comparing day and night. I now see what I need to change.

Delphine Papo, an Ivorian cocoa farmer from Watte village, San Pedro. She attended a training on cocoa fertilization with other beneficiary farmers in Watte as part of the project the Africa Fertilizer Financing Mechanism supports

Navigating challenges, driving change

The AFFM's journey has not been without challenges. The recent hurdles have included the COVID-19 pandemic, followed by the Russia-Ukraine conflict, both of which disrupted global fertilizer supply chains, causing prices to skyrocket. In many African countries, currency depreciation further exacerbated the affordability crisis and affected the purchasing power for farmers and distributors. These shocks tested the resilience of African farmers and the organizations supporting them.

However, the crisis in access to financing has surpassed the fertilizer crisis, underscoring the need for mechanisms like AFFM to stabilize the sector. This situation has highlighted the critical importance of financial solutions, such as those provided by the AFFM. At the same time, it has exposed the necessity for more comprehensive and innovative financing mechanisms—a lesson the AFFM has taken to heart as it plans its next phase.

Fertilizer bags from SuperFert, Africa Fertilizer Financing Mechanism's implementing partner in Zimbabwe

A vision for AFFM 2.0: Scaling up

Recognizing the evolving needs of Africa's fertilizer sector, AFFM is transitioning to AFFM 2.0. This transformation is informed by the following three key drivers:

1. The 2024 Nairobi Declaration on Fertilizer and Soil Health, where African leaders have committed to strengthening fertilizer access and soil health interventions.
2. The African Development Bank's 10-Year Strategy (2024–2033), emphasizing inclusive growth, resilience, and sustainable development.
3. Lessons from the AFFM's impact assessment in 2023, which identified opportunities to scale up its operations, introduce new financing instruments, and target more countries.

AFFM 2.0 promises to be a game-changer, with a broader mandate and ambitious targets. Set to launch in late 2025, AFFM 2.0 represents a bold step forward to adopting a more comprehensive approach. It will focus on developing financial products that complement private sector investments with concessional financing, such as blended finance, risk-sharing instruments, Establishing a multi-source soil health fund for research and innovation.

The road ahead

The AFFM's journey is a testament to the power of collaboration, innovation, and strategic investment. The design of AFFM 2.0 is expected to conclude in early 2025, with a robust framework, governance structure, and funding strategy to support its ambitious agenda.

This scaling up comes at a critical time. With Africa facing rapid population growth, climate change, and global economic uncertainties, agricultural productivity must rise to meet the continent's food security needs.

This project reflects a growing recognition of the importance of innovative financing solutions in addressing systemic challenges in agriculture. The AFFM 2.0 will be poised to tackle Africa's fertilizer financing challenges with renewed vigour. ■

About the author:
Marie Claire Kalihangabo, the inaugural Coordinator of the Africa Fertilizer Financing Mechanism at the African Development Bank Group (AfDB) since November 2017. With over 23 years of professional experience across public, international, and development organizations in Africa, her tenure at the International Fertilizer Development Center (IFDC) and roles within the Government of Rwanda attest to her expertise in overseeing multi-donor agricultural value chain projects and navigating the intricacies of fertilizer sector financing.

Digital soil maps

Unlocking agronomy solutions for farmers in West Africa and the Sahel

Written by

Barbra Sehlule Mazata, *Communications Leader,* ***CGIAR Excellence in Agronomy Initiative, Kenya***

West Africa and the Sahel, a region where millions of smallholder farmers struggle with low yields and soil degradation, faces a looming threat of food insecurity. The delicate balance of these communities is further disrupted by climate change, which compounds the issue of poor soil health. However, a glimmer of hope emerges in the form of digital soil health and fertility maps, a technological innovation poised to revolutionize agriculture in the region.

These cutting-edge tools offer precise, data-driven solutions to improve soil management, boost productivity, and enhance climate resilience. By integrating vast datasets from soil samples, satellite imagery, and geospatial analysis, digital soil maps provide a comprehensive understanding of soil health across the region. This granular level of insight empowers farmers to make informed decisions, such as selecting appropriate crop varieties, optimizing planting schedules, and tailoring irrigation strategies to local conditions. Tools such as AgWise, which leverage these maps, deliver localized advice directly to farmers, enabling them to mitigate climate risks and increase their yields.

Farmers are benefiting from the use of the AgWise digital advisory tool

Beyond climate resilience, digital soil maps contribute to environmental sustainability by minimizing the overuse of fertilizers. By identifying specific nutrient deficiencies, farmers can apply precise amounts of fertilizer, reducing environmental harm such as soil acidification and water contamination. This precision farming approach promotes sustainable land management practices, preserving soil health for future generations.

The economic impact of digital soil maps is equally significant. By adopting data-driven practices, farmers can achieve yield increases of up to 40% and profit gains of 20%. This translates into improved livelihoods for individual farmers and, on a larger scale, reduced food import costs for nations, bolstering regional food security.

Investments in digital infrastructure

The development of digital soil maps relies on advanced technologies such as artificial intelligence and machine learning, which analyse complex datasets to generate detailed and accurate maps. These tools are complemented by mobile apps and digital platforms that provide user-friendly access to soil data and recommendations for farmers and extension agents. Collaborative efforts between organizations like the International Soil Reference and Information Centre (ISRIC), iSDAsoil, and the Regional Hub for Fertilizer and Soil Health for West Africa and the Sahel (the Hub) contribute to the accuracy and reach of these maps.

While the potential of digital soil maps is immense, challenges remain, ensuring high-quality, standardized data collection and sharing is crucial. Unified databases and partnerships between governments, research institutions, and the private sector are essential to fill data gaps. Additionally, investments in digital infrastructure and capacity-building programs are necessary to enable stakeholders, from policymakers to farmers, to utilize these maps effectively.

The African Union's 10-Year Action Plan for Fertilizer and Soil Health recognizes the importance of multi-stakeholder partnerships to drive investments in soil management. The Hub's strategy is framed by the priorities of the Fertilizer and Soil Health Roadmap 2023 and the Nairobi Declaration from the Africa Fertilizer and Soil Health Summit 2024.

"The release of improved digital soil maps is not just a technological breakthrough – it's a testament to the collective resolve of governments, researchers, and farmers to transform agriculture in West Africa and the Sahel. Fertile soil is the foundation of food security, and these maps bring us closer to that goal," says Bernard Vanlauwe, Deputy Director General, Research for Development at IITA and chair of the Hub consortium steering committee.

iSDAsoil: Soil and agronomy maps for Africa

Climate-smart agronomy

As the updated digital soil maps are set to launch in early 2025, the Regional Hub is actively working on expanding mapping efforts, enhancing data accuracy, and supporting the development and adoption of climate-smart agronomy tools such as AgWise. AgWise is a freely available, open-source tool that provides data-driven, localized, and climate-specific agronomic recommendations. It combines agronomic and geospatial datasets from field trials, market analyses, and open data sources to deliver tailored advice on optimal planting times, cultivar selection, fertilizer types and quantities, and good agronomic practices. Currently supporting eight crops, including cassava, maize, rice, potato, and wheat, in key African countries, AgWise integrates soil, weather, and satellite data from sources such as ISRIC to contextualize recommendations for specific growing conditions. Designed to empower smallholder farmers, the platform offers actionable insights to improve productivity and profitability, while its open-source nature enables further development by the global agricultural community.

Governments, donors, and private-sector stakeholders have a crucial role to play in realizing the full potential of digital soil maps. By investing in digital infrastructure and capacity building, implementing policies that incentivize the use of these tools, and fostering regional collaboration, they can contribute to a future where West Africa and the Sahel achieve resilient, sustainable, and inclusive agricultural growth, ensuring food security and prosperity for generations to come.

"Agricultural productivity and soil resilience in West Africa and the Sahel aren't just about food security – they are foundational to economic stability and climate resilience," notes Vanlauwe.

As we approach the release of the new maps, the promise of data-driven agriculture in West Africa has never been more tangible.

The Regional Hub for Fertilizer and Soil Health for West Africa and the Sahel

The Regional Hub is a collaborative effort initiated at the Africa Fertilizer and Soil Health Summit in Nairobi on 8 May 2024, focusing on combating soil health decline in the region. It was launched in IITA headquarters in Ibadan, Nigeria, in June 2024 and brings together key stakeholders, including the International Institute of Tropical Agriculture (IITA), OCP Africa, the African Plant Nutrition Institute (APNI), University Mohammed VI Polytechnic (UM6P), International Fertilizer Development Centre (IFDC), and the World Bank. The Hub invites partnerships with other organizations, research institutions, and private sector entities to achieve a thriving agricultural future in the region.

The impact of the Hub is magnified by the collaboration of key partners, each contributing its unique strength. The International Institute of Tropical Agriculture (IITA), the agricultural research partner with a proven track record in advancing crop production in Africa, was selected to host the Hub. OCP Africa provides tailored, sustainable fertilizer solutions to meet the specific needs of local soils and crops essential for improving soil fertility and agricultural sustainability. The African Plant Nutrition Institute (APNI) advances plant nutrition research and develops training programs, helping farmers build knowledge and implement best practices in soil health management. The International Fertilizer Development Center (IFDC) supports the Hub with its expertise in developing and disseminating effective fertilizer technologies and fostering public-private partnerships to ensure innovative solutions reach farmers.

Accelerating the Impacts of CGIAR Climate Research for Africa (AICCRA) is a key knowledge partner that offers soil information, knowledge management, agronomy recommendations, capacity development, policy support, and advocacy. Mohammed VI Polytechnic University (UM6P) drives scientific and technical advancements through soil mapping, remote sensing, and precision agriculture tools. The Economic Community of West African States (ECOWAS) plays a crucial role in aligning the Hub's activities with regional policies and promoting best practices across member states. ■

How naturally occurring hydrogen could supply the world with low-carbon, cost-competitive fertilizers

Written by

Morten Stahl, *Founding Partner,* ***Natural Hydrogen Ventures, Denmark***

The world needs fertilizer - and a growing amount of it. Some regions, such as Africa, face a significant deficit and could benefit enormously from the increased food production resulting from greater fertilizer use. At the same time, fertilizer production is a major contributor to climate-damaging emissions, primarily due to the production of hydrogen used in ammonia synthesis. In my view, this dual challenge of increasing food security while addressing climate change calls for innovative solutions, and natural hydrogen might be the answer.

Morten Stahl, Founding Partner at Natural Hydrogen Ventures

Why green hydrogen might fall short

In the search for solutions, green hydrogen has been proposed. However, it remains too expensive to replace the fossil-derived hydrogen currently in use. This is particularly true in developed markets but also applies to Africa, where imported fertilizer is already prohibitively expensive. That said, locally produced fertilizer using green hydrogen could, in some cases, be competitive – I have seen examples of this. Even so, one might argue that the electricity required to produce green hydrogen could be better utilized to support underpowered or emissions-heavy grids. These are valid concerns, emphasizing the need for alternative approaches. For now, however, let us focus on the transformative potential of natural hydrogen for Africa and the world, particularly in fertilizer production.

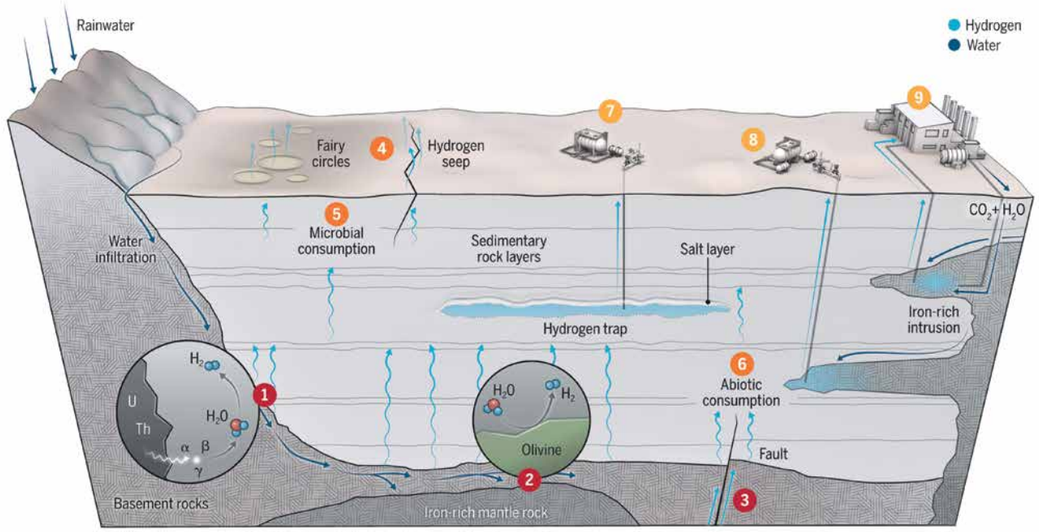
What is natural hydrogen?

Natural hydrogen, also known as geologic, gold, or white hydrogen, is a naturally occurring form of hydrogen gas found in underground reservoirs. It forms through natural geological processes, such as the reaction of water with iron-rich rocks or the radioactive decay of elements deep within the earth's crust.

Unlike other types of hydrogen, it does not require an external energy input, as is the case with green hydrogen (produced using electricity) or grey hydrogen (derived from natural gas or methane). Instead, it serves as a primary energy source that can be extracted and used directly, potentially at a very low cost. Estimates from Thunder Said Energy and others suggest that natural hydrogen could be produced for approximately USD1/kg, with minimal associated emissions.

This distinction is crucial. While all other forms of hydrogen are merely energy carriers – requiring significant energy inputs for their production – natural hydrogen holds the potential to be both a primary energy source and an economic game-changer.

Figure 1. Earth's hydrogen factories: Hydrogen is a carbon-free fuel, but manufacturing it is dirty and expensive. Some researchers believe cheap, vast, and potentially renewable sources of natural hydrogen sit underground



Generation

1. ***Radiolysis*** **-** Trace radioactive elements in rocks emit radiation that can split water. The process is slow, so ancient rocks are most likely to generate hydrogen.
2. ***Serpentinization*** **-** At high temperatures, water reacts with iron-rich rocks to make hydrogen. The fast and renewable reactions, called serpentinization, may drive most production.
3. ***Deep-seated*** **-** Streams of hydrogen from Earth's core or mantle may rise along tectonic plate boundaries and faults. But the theory of these vast, deep stores is controversial.

Loss mechanisms

4. ***Seeps*** **-** Hydrogen travels quickly through faults and fractures. It can also diffuse through rocks. Weak seeps might explain shallow depressions sometimes called fairy circles.
5. ***Microbes*** **-** In shallower layers of soil and rock, microbes consume hydrogen for energy, often producing methane.
6. ***Abiotic reactions*** **-** At deeper levels, hydrogen reacts with rocks and gases to form water, methane, and mineral compounds.

Extraction

7. ***Traps*** **-** Hydrogen might be tapped like oil and gas—by drilling into reservoirs trapped in porous rocks below salt deposits or other impermeable rock layers.
8. ***Direct*** **-** It might also be possible to tap the iron-rich source rocks directly, if they're shallow and fractured enough to allow hydrogen to be collected.
9. ***Enhanced*** **-** Hydrogen production might be stimulated by pumping water into iron-rich rocks. Adding carbon dioxide would sequester it from the atmosphere, slowing climate change.

Credits: American Association for the Advancement of Science (AAAS); (Graphic) C. Bickel/SCIENCE; (Data) Geoffrey Ellis/USGS

Abundant and accessible

Natural hydrogen is estimated to exist in vast quantities, comparable to oil and gas, and may be found in reservoirs worldwide. Currently, more than 50 companies are actively exploring natural hydrogen globally, with at least five focused on Africa. If large, industrial-scale reservoirs are discovered, they could support sizable fertilizer plants. However, the first producing fields are likely to be smaller, more localized deposits, where proximity to markets will be crucial.

There are five companies currently exploring natural hydrogen in Africa

Africa's geological characteristics make it particularly promising for natural hydrogen exploration. Across the continent, there are numerous indicators of underground hydrogen deposits, including bubbling springs and hydrogen-rich soil anomalies.

Fertilizer Production: A natural fit

One of the first steps I take when evaluating a potential natural hydrogen investment is assessing market access. In many regions, local fertilizer production – particularly ammonia – represents an ideal market. Ammonia is the simplest form of industrial fertilizer, with hydrogen being the largest cost component in its production. While natural hydrogen could also support the production of urea or other fertilizers, these typically require larger volumes of hydrogen. For this discussion, we will focus on ammonia.

Since hydrogen is the primary cost driver for fertilizers such as ammonia, low-cost natural hydrogen could make small-scale ammonia plants – originally designed for green hydrogen – economically viable. This would result in ammonia that is as affordable, or even cheaper, than imported fossil-based ammonia. Local markets would gain access to affordable, low-carbon fertilizers without incurring a green premium.

This illustrates the transformative potential of natural hydrogen: it can decarbonize essential industries while maintaining or even reducing costs for everyday goods such as food and energy.

Figure 2. The five companies currently exploring for natural hydrogen in Africa

getech H2Au HydroGenesis HYDROMA SOUND ENERGY PLC

Geographic considerations

This approach makes the most sense in regions where ammonia is already used directly as a fertilizer. While this practice is not universal, there are areas where it could be implemented, potentially through irrigation systems. Africa's geology is particularly favourable for natural hydrogen, with numerous locations likely to host viable reserves. This presents a significant opportunity to align hydrogen production with local agricultural needs.

For instance, countries such as Mali and Tanzania have shown early promise in hydrogen exploration. Imagine a scenario where these reserves support regional fertilizer production hubs. Such hubs could significantly reduce reliance on imported fertilizers, lowering costs and emissions while fostering self-sufficiency.

A case study: The U.S. Midwest

A world-class example of this synergy can be found in the U.S. Midwest, where corn farming intersects with geological potential for natural hydrogen. In states such as Nebraska, Iowa, and particularly north-eastern Kansas, numerous companies are exploring natural hydrogen, with around 10 wells drilled to date. Some of these wells may already produce enough hydrogen to support a small-scale ammonia plant catering to local markets. Although no data from these wells has been publicly released, the level of activity underscores the potential for natural hydrogen to revolutionize local fertilizer markets.

Our calculations suggest that natural hydrogen, using available small-scale ammonia technology, could be converted into ammonia and sold to local farmers at a price comparable to fossil-based ammonia. This includes a risk-adjusted profit for all parties involved. This example illustrates how local hydrogen production can meet agricultural needs while reducing emissions. It is a model that could be adapted and scaled to benefit other regions, including Africa.

Transformative potential in Africa

The same approach could have an even greater impact in Africa. Local, low-cost ammonia production has the potential to address food security challenges and boost agricultural productivity, all while reducing emissions. Five companies are currently exploring natural hydrogen in Africa, highlighting the continent's vast potential. Although further exploration and drilling are needed to identify viable reserves, the long-term benefits could be immense. Africa's combination of favourable geology and pressing agricultural needs positions it as an ideal candidate for leveraging natural hydrogen in fertilizer production.

With Africa's growing population and urgent need for improved food security, this synergy could deliver profound economic and environmental benefits.

Moreover, natural hydrogen exploration could stimulate local industries and create jobs. From well drilling to plant operations, developing a hydrogen-based fertilizer sector could drive economic growth and strengthen communities. This aligns seamlessly with the broader goals of sustainable development and energy transition.

Overcoming challenges

Of course, the path forward is not without obstacles. Exploration efforts need to be scaled up to identify commercially viable reserves, and infrastructure must be developed to transport and process hydrogen. Additionally, robust regulatory frameworks will be crucial to ensure development is both efficient and environmentally responsible.

However, these challenges are surmountable. History shows that when a resource offers transformative potential – as oil and gas did in the 20th century – necessary investments and innovations tend to follow. With more than 50 companies globally now engaged in natural hydrogen exploration, up from around 10 just two years ago, the momentum is already building.

Africa's geological characteristics make it promising for hydrogen exploration

A bullish outlook

I am unabashedly optimistic about the potential of natural hydrogen, particularly in fertilizer production. While I anticipate the first commercial discoveries will occur in the U.S., the implications for food security and agricultural productivity in Africa could be extraordinary. Natural hydrogen has the potential to lower emissions, reduce costs, and foster local supply chains – delivering significant benefits to both developed and developing regions. The possibilities are truly staggering.

I firmly believe that natural hydrogen will play a pivotal role in the next chapter of global agriculture. Its unique ability to bridge the gap between economic growth and environmental sustainability sets it apart as a resource like no other. Now is the time to seize this opportunity and unlock its potential, especially for the regions that need it the most and stand to benefit the most. ■

Strategies to enhance the commercialisation of circular fertilizers

Written by

Ambrogio Pigoli, *Technical Staff,* **Jenny Campagnol,** *Technical Staff,* and
Eva Lopez Hernandez, *Manager of Collaborative Projects,* ***Consorzio Italiano Compostatori, Italy***

The European Union is facing a significant decline in soil quality. Soil surfaces are decreasing due to ongoing urbanization and infrastructure development, while large areas of soil are contaminated by heavy metals and organic pollutants. Additionally, erosion is reducing the availability of fertile land, and desertification has become a pressing issue, particularly in the Mediterranean region. These challenges threaten not only the environment but also agricultural productivity and ecosystem resilience.

The FER-PLAY project intends to foster the uptake of circular fertilisers in EU

Organic matter plays a critical role in maintaining productive and healthy soils. It enhances soil structure, making it softer, easier to till, and more conducive to root growth. Moreover, organic matter helps the soil manage extreme weather conditions: during heavy rainfall, it improves water infiltration and reduces runoff, while in drought periods, it absorbs and gradually releases water, mitigating stress on crops. Organic matter also plays a key role in reducing soil erosion, preserving the land's fertility and stability.

To address these challenges, the EU has introduced the Soil Monitoring Law, which aims to map soil quality across member states. This initiative paves the way for future legislation dedicated to protecting soil health. In the meantime, the European Commission is funding projects to raise awareness among stakeholders from both agricultural and environmental sectors. These efforts aim to promote sustainable practices and foster collaboration to safeguard its soil, which is one of the EU's most vital resources.

FER-PLAY is a European project working to decrease EU dependence on fertilizer imports and improve resource efficiency through the promotion of circular fertilizers. The project objective is to map and assess circular fertilizers made from waste, by-products and wastewater (like compost, digestate or spent mushroom substrate) and highlight their multiple benefits to foster their wide-scale production and application.

As a result of the numerous co-creation activities engaging the circular fertilizer producers, the project has elaborated a guideline document specially dedicated to them, that displays a compilation of messages and recommendations that may contribute to solve the main hurdles that they encounter when approaching the market and the civil society. This chapter summarises the main successful strategies to enhance the commercialisation and market value of the circular fertilizer product.

Assign the correct market value to your product

In some cases, the main revenue obtained by circular fertilizer producers is not linked to the fertilizer itself but to the service they provide managing and treating the feedstock. It might be the case for example for the producers of compost and solid digestate out of bio-waste or of the producers of struvite out of wastewater.

Due to these alternative revenue streams, producers might reduce the emphasis on marketing the fertilizer

Offering an integrated system that includes the service from a third party with specific machinery for the efficient application of the fertilizer is a good commercial strategy to overcome concerns and facilitate the transition to the use of circular fertilizers

effectively, selling the circular fertilizer at a low price or even give it away for free. Establishing a market value that takes in account nutrients and soil benefits helps in building a sustainable business model. A balanced approach, that considers all possible revenues from the company activity, can enhance the overall profitability and sustainability of the business.

Build an integrated selling system that provides support for best practices

Farmers often hesitate to switch to circular fertilizers; these worries stem from the significant changes that new fertilizers might bring to their well-established agricultural practices. To address these concerns and facilitate a smoother transition, a circular fertilizer producer can offer an integrated system that includes:

- The advice of an agronomist with in-depth knowledge of the circular fertilizer and that ensures that the application of the product is the most efficient for the farm and safe for the environment
- Transport service of the fertilizer to the farm
- Support in bureaucratic aspects associated with the application of the new fertilizer
- Service from a third party with specific machinery for the application of the fertilizer to ensure that the product is distributed evenly and effectively, maximising its benefits

Plan with farmers

By establishing yearly sales contracts with farmers, circular fertilizer producers can better manage their production cycles, reduce inventory challenges and meet the agronomic needs of farms effectively. This strategic approach not only benefits the producers by stabilising their operations but also supports farmers in achieving optimal crop yields with timely and adequate fertilizer supply.

This solution could be extended to an arrangement between the fertilizer producers and farmers to receive the agricultural waste with the aim to use as an input for circular fertilizer production. The producer will benefit from a constant supply of input of known quality, while reinforcing the relationship of trust with the agriculture sector.

Consider alternative market destinations for the product beyond its traditional use on arable land.

Certain circular fertilizers can be refined to enhance both their quality and market value. For instance, compost and solid digestate can be pelletized or packaged instead of being sold in bulk. While this refinement process involves higher costs, it enables producers to charge premium prices. Packaged products are more convenient and appealing to consumers, particularly in retail markets. By investing in refinement and quality improvements, producers can tap into more lucrative market segments and boost their profitability.

Organic Farming: a pivotal market sector for circular fertilizers

Organic farming has emerged as a significant market sector in Europe, highlighting the growing importance of sustainable agricultural practices. This sector's expansion is driven by both regulatory targets and market dynamics, making it a crucial outlet

for circular fertilizer production. As of 2022, the European agricultural surface allocated to organic farming reached 18.5 mn hectares, representing more than 10% of the total farmland in the region. It is important to keep in mind that the EU organic Regulation 2018/848 prohibits the use of chemical fertilizers. This creates an urgent need for alternative nutrient sources to maintain soil fertility and productivity. Many organic farms in the EU suffer from negative nutrient balances, particularly in phosphorus, which is crucial for plant growth. To address these challenges, circular fertilizers present a viable and promising solution for organic agriculture and, for producers, a lucrative market opportunity.

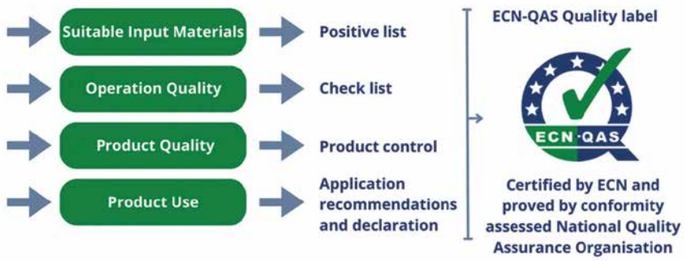
For many organic end-users it is not clear which circular fertilizers are allowed in organic farming. For this reason, a cooperation between the organic farming associations, their certification schemes (e.g. Biokreis, Bioland, GÄA and Naturland) and the certification schemes for circular fertilizers (e.g. ECN-QAS in EU, CIC in Italy, BGK in Germany, KBVÖ in Austria and Vlaco in Flanders) are promising approaches to achieve confidence in circular fertilizers by the organic farmers and to increase their use in the organic farming sector.

Circular fertilizers in Green Public Procurement and the role of the public administration as key customer

The Green Public Procurement (GPP) in the EU is defined as a process of procuring goods, services and works with reduced environmental impact throughout their life cycle. In some EU countries where GPP policies are well-defined, circular fertilizers are included in the list of goods that public administrations are encouraged to purchase when they need fertilizers.

Public administrations can be a significant customer of circular fertilizers, driven not only by quality and pricing but also by environmental sustainability considerations. Producers should keep in mind that public entities often have mandates to reduce their environmental footprint, making circular fertilizers an attractive option. Building relationships with public sector buyers and understanding their procurement criteria can help producers effectively position their products in this market.

Figure 1. Through their comprehensive and transparent approaches, QAS help producers demonstrate their commitment to excellence and responsibility, thereby fostering a more trustworthy and sustainable market environment. A good opportunity is the certification under the ECN-QAS for the production of high-quality compost and digestate from the recycling of bio-waste



Source: European Compost Network ECN e.V.

Focusing on certifying the quality of the fertiliser and of the production process is always a winning strategy

Adopt voluntary Quality Assurance Schemes

Quality Assurance Schemes (QAS) certifications are self-imposed systems or standards that companies adopt to ensure their products meet certain quality benchmarks beyond regulatory requirements. These schemes involve internal processes, independent audits, or certification by third-party organizations to assure customers and stakeholders of the product's safety, durability and overall quality. Unlike mandatory regulations, these schemes are often used by companies to differentiate their products, demonstrate commitment to high standards, and enhance consumer trust. This is particularly important in circular fertilizers market, due to the concern related with these products being produced by waste streams. QASs for circular fertilizers cover material suitability, production consistency, and environmental responsibility, with recognized examples across Europe like the European Compost Network's ECN-QAS holding a scheme for the production of high-quality compost and digestate from the recycling of bio-waste.

For further information read more at: ***http://fer-play.eu/resources/*** ■

Conference review:

International Fertiliser Society conference 2024

Written by

Elaine Jewkes, *Director,* ***SoilSense Ltd, UK*** and *IFS Secretary designate*

Mid-December 2024 again saw delegates assemble in Cambridge for the International Fertiliser Society (IFS) conference - combined production/agronomic conference which has been running since 2022. The programme offered twenty papers, with parallel sessions providing eight fertilizer production and eight agronomic presentations, as well as a further four of combined interest. The conference finale was a panel discussion, exploring the innovations that the fertilizer/crop nutrition industry needs to meet the challenges it faces, with an expert panel covering technical, agronomic and farmer viewpoints.

The interest provided by the papers was augmented by a vibrant poster session. Covering a wide range of both topics and countries, 21 posters were displayed, alongside those from the 13 finalists in the Brain Chambers Award for Early Career Researchers in Crop Nutrition.

The agronomic papers spanned a broad range of topics. Diogenes Antille from CSIRO in Australia presented a synthesis of work showing how controlled traffic farming can help to reduce greenhouse gas emissions, whilst Hans-Werner Olfs of Osnabrück University used case studies to show how highly targeted application of liquid manures on arable land, using low-emission spreaders, can be of benefit to the crop and environment. Two authors gave presentations on methods to estimate the benefits of cover crop use: Luca Bechini from the University of Milan outlined a soon-to-be launched decision support system which helps users to choose the best cover crop species that provide one or more agroecological benefits, indicating when and how the crop should be destroyed. Following this, IFS council member Lional Jordan-Meille of Agro-Sciences in France showed how the decision support tool MERCI helps users to estimate the nitrogen return from a range of cover crops to the next planted crop.

Agronomic papers

Frank Liebisch from Agroscope in Switzerland gave an overview of how the country is seeking to enhance its approach to crop nutrition to address environmental and resource challenges. The approaches range from digital/IT solutions, improved fertilizer recommendation systems and greater use of precision technologies. This wide-scope talk was followed by a presentation from Thomas MsCarthy of Teagasc in the Republic of Ireland looking at how soil-specific advice for potassium inputs can bring benefits.

The final agronomic papers each gave an overview of two classic long term field trial experimental sites. Melkamu Jate of Yara's Hanninghof Research Centre in Germany demonstrated how balanced nutrition has had a transformative effect for sustainable crop production and crop health, looking at trials carried out over the 66-year history of the Hanninghof centre. With a history spanning some 180 years, the Broadbalk experiment at Rothamsted Research offers a wealth of data and information as to the effects of crop nutrition on wheat production. Paul Poulton gave a comprehensive overview of the findings throughout the site's history, outlining some of the lessons for today's scientists and practitioners.

Production presentations

Of likely greater interest to Fertilizer Focus readers are the combined and production presentations. The conference began with a combined session, bookended by two papers discussing environmental aspects of crop production. Opening the day, Alfredo Rodriguez of University of Castilla-La Mancha in Spain, showed how the NBCalCer model (Nitrogen Benefit Cost calculator for Cereals) could be used to quantify the effects of nitrogen input on grain yields, nitrogen budgets and major environmental impacts worldwide, at country to state resolution. In the study presented, NBCalCer was used to analyse the benefit-cost consequences for both the farmer and for society as a whole, and to quantify the economic optimum N rates for farmers (EONR) and for society (SONR).

Gerard Ros of Wageningen University and Research, in The Netherlands gave a powerful paper outlining *The adverse impacts of nitrogen use in Europe on human health, climate, and ecosystems*. Whilst at first glance a counterintuitive speaker for a fertilizer conference,

(top left) Ruud Swarts from OCI Nitrogen; *(top right)* Vincent Duponchel from Yara was the inaugural winner of the Kish Shah Award; *(bottom left)* Steve Hallam with IFS President Anthony Zanelli; *(bottom right)* The Brian Chambers Award winners

the paper showed that, despite significant reductions in N emissions, hotspots of N pollution persist. With a recognition that N is critical for sustaining food production, the presentation advocated integrated plant nutrition strategies that minimise environmental impacts while maintaining agricultural productivity. Within this, there are key questions regarding the applicability and effectiveness of sustainable nitrogen management practices, considering both economic and ecological factors.

Between these two presentations, industry papers gave insights into current and indeed future fertilizer industry considerations. Argus Media's own Mike Nash outlined the *Impact of the EU Carbon Border Adjustment Mechanism (CBAM) on the cost and supply of fertilizer*. CBAM is a levy which puts a carbon price on the import of some fertilizers made outside the EU. It is designed to encourage non-EU producers to decarbonise, to avoid 'carbon leakage'. In the paper, Mike outlined the current status of CBAM, the timeline for eventual full introduction of the levy and the products it applies to, namely AS, AN, CAN, UAN, NP, NPKs, NPs, DAP, MAP, urea and ammonia. These constitute the bulk of imports into the EU. He also examined how CBAM actually works with the Emissions Trading System (ETS) as well as the likely impact on Europe's fertilizer sector and, crucially, the prices of those fertilizer products.

Emerging practices

Kevin Rouwenhurst of the Ammonia Energy Association in The Netherlands discussed the *Impact of new electrolysis technology on the production of green ammonia and farm gate prices*, an important topic as these technologies begin to be in production use. Outlining how the development and industrialisation of electrolysis technology is proceeding at pace, Kevin also discussed the emerging good practice in implementing electrolyser capacity in ammonia plants, with a focus on revamps or newbuilds, and developments and potential benefits or impacts of green NH_3 revamps.

The dedicated technical papers opened with a presentation from Vincent Duponchel of Yara Belgium S.A., *Fertilizer production and process safety: major PS challenges caused by a less stable world*. Vincent's paper considered four main questions:

- ***People:*** How to ensure competence continuity? Ensuring training can meet the needs of different generations.
- ***Planet:*** Are we ready for climate change? There are impacts on equipment that has not been designed for severe weather conditions, whether air conditioning systems in control rooms, or the ability of civil structures to resist high winds and flooding. How should we proactively review such risks?
- ***Product:*** Are we sufficiently considering the impact of new equipment, processes and products in our entire supply chain: from product compatibility to raw materials with different specifications?
- ***Parasites:*** How do we maintain our cyber-safety integrity as we increasingly use connectivity in our operations? Whilst connectivity is an advantage for operations, it offers an opportunity for hackers.

Vincent was the inaugural winner of the Kish Shah Award for outstanding contributions to the advancement of health, safety, environmental and security aspects of the nitrogen fertilizer industry, which will be awarded biennially for ten years.

Following Vincent, Ruud Swarts from OCI Nitrogen in The Netherlands discussed *How to shape low carbon fertilizer production in Europe*. Outlining how there is a strong need to adapt in the coming decade, Ruud showed how the differences in local situation can have a large impact on the optimal pathway for each producer, with CCS being appropriate for some, whilst others could turn to green hydrogen (from electrolysis), or even cease local production, importing ammonia from outside the EU. In addition, technical challenges exist in increasing the share of low(er)-carbon hydrogen, raising the question of whether the existing facilities can be repurposed or if investment in brand new installations are needed?

Two papers concentrated on gypsum, including aspects of sustainability. Thibaut Theys from Prayon Technologies in Belgium gave one: *Gypsum Utilisation in the Phosphoric Acid Industry: A Path to Sustainability*, reviewing the current state of play regarding the management and usage of by-product gypsum. Two particular areas of focus in this paper were recent developments to improve the quality of gypsum being added to the storage stacks, and new ways to enable wider productive use of the legacy gypsum that is already in the stacks. Following this, Ricardo Sepulveda of Pegasus TSI in the USA spoke about *Gypsum Regeneration with Clean Energy in the Fertilizer Industry*. The paper reviewed the technical and economic feasibility of using clean energy from sulphuric acid production to calcine clean gypsum, which itself can be produced from the phosphoric acid process, to produce SO_2 and CaO. These two by-products have uses: SO_2 can be fed into the existing sulphuric acid plant to produce sulphuric acid. The CaO by-product can be commercialised as a high quality lime raw material with a low carbon footprint.

Emission reduction potential

A second paper from Prayon Technologies was given by Thomas Dethier on *Removal of magnesium from phosphate rock*. Thomas outlined how Prayon, in collaboration with Eurochem, have developed a process to leach magnesium from phosphate rock, allowing rocks with higher concentrations of Mg to be used as a raw material. The process only produces products with a value, not wastes, and can remove up to 70% of the Mg whilst providing up to 98% P_2O_5 yield.

Another IFS council member, Mark Brouwer, of ureaknowhow.com in The Netherlands outlined *New developments in the production of urea incorporating sulphur*. Mark discussed the usefulness of adding ammonium sulphate to urea to produce an N:S fertilizer, as well as the challenges of doing this. This paper described the production technologies already available to produce these high value N+S fertilizers as well as the upcoming production technologies.

Two papers from Yara specialists ended the production sessions. Andrew de Smet, of Yara Sluiskil B.V. in The Netherlands spoke about *Pushing the limits of Secondary N_2O abatement*. Andre outlined how, as part of an aim to become carbon neutral by 2050, Yara identified the potential of N_2O abatement to achieve large emission reductions. By selecting the plants with the highest N_2O reduction potential, abatement levels of more than 99% can be achieved by using Yara's own secondary abatement catalyst. The sustainability of these very low emissions is achieved by a structured plants' emission reporting programme, follow up of the catalyst performance, inspection and proper maintenance of the catalyst containment. Ending the session, Knut Wiig Mathisen, of Yara International, Norway, spoke on *Advanced Process Control (APC) in fertilizer production*. The APC system is a multivariable, model-based controller that uses the model predictive control algorithm. It is a three-stage receding horizon controller where each stage (prediction, steady-state optimisation, and dynamic optimisation) is fully repeated each minute over the prediction and control horizon of several hours. Knut described how APC is implemented in Yara using two concrete project and plant examples, one from ammonia and one from granulation. The paper also discussed best practice and lessons learnt related to software/technology and project procedures/ organisation. ■

A farewell to Steve Hallam

The conference was also the final one to be organised by IFS Secretary Steve Hallam, who has run the Society for a little over 10 years. During his tenure, Steve has driven the organisation forward, bringing wider coverage through social media and introducing webinars and online attendance at the conference, and, importantly, ensuring the genesis of FerTechInform. Steve gave a paper in the last session of the conference outlining his thoughts on the challenges facing IFS and the wider industry, from production to agronomy, inviting members and attendees to offer their views and thoughts. Council members collaborated to present Steve with gifts based on his favourite things – a generous selection of Belgian beers, a nature book, but most importantly, a framed print by renowned naturalist and artist Peter Scott.

Steve will be a hard act to follow, but we wish him an active and enjoyable retirement!

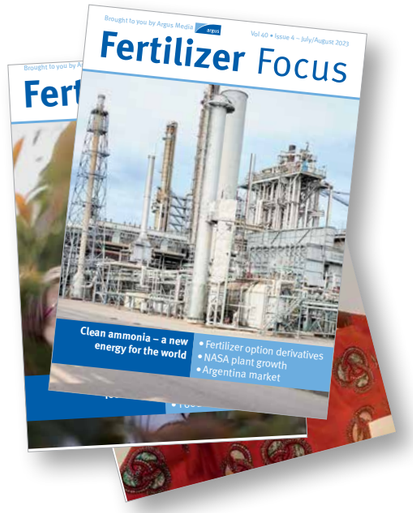
Fertilizer Focus

Media pack 2025

Fertilizer Focus heritage

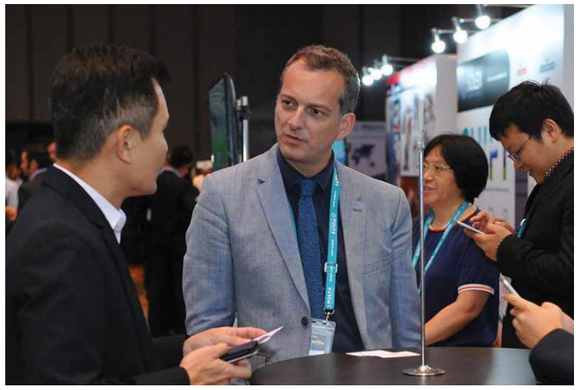
Argus produces the most comprehensive suite of pricing and market intelligence services available to the fertilizer industry

First published in February 1984 by FMB Consultants, Argus' Fertilizer Focus is the world's leading bi-monthly journal serving the international fertilizer industry. It covers the key developments influencing fertilizer and related markets, such as production economics, technology, plant and project news, and product logistics.



Drawing on Argus's unrivalled expertise and wealth of contacts from our market reporting, consulting and conferences, the editorial content in Fertilizer Focus covers the issues which are top-of-mind for senior executives in the industry. As an advertiser, your message reaches decision makers throughout the world and positions you as a thought-leader on the cutting edge topics which will define the future of the industry. The magazine features a unique blend of news, features, interviews and analysis of all aspects of the fertilizer industry, including:

- Spotlight on hot new trends and growth areas - including clean ammonia and low carbon/ sustainable fertilizers
- New product developments – fertilizer blends, enhanced efficiency ingredients, micronutrients, liquid fertilizers
- Fertilizer production technology across all products
- Port logistics and shipping
- Company strategy, industry developments and emerging markets
- Agronomic analysis and changes in agricultural practice impacting fertilizers



Editorial schedule

January/February issue

Advertising due date - **6 December 2024**

Special Focus - INFRASTRUCTURE AND LOGISTICS

- Overview of new facilities
- Risk accessing shipping markets
- Traceability and certification

SUPPLEMENT - AFRICA

- The African Fertilizer Financing Mechanism
- Regional Hub for Fertilizer and Soil Health in West Africa and the Sahel
- Integrating Africa through technology

March/April issue

Advertising due date - **14 February 2025**

Special Focus - LOW CARBON FERTILIZERS

- Adapting fertilizer production for decarbonisation
- Low carbon nitrogen processes
- Next generation enhanced efficiency fertilizers

SUPPLEMENT - ASIA

- The Asian sulphur markets
- Future growth in India
- Key transport routes

May/June issue

Advertising due date - **11 April 2025**

Special Focus - PRODUCTION TECHNOLOGY

- Innovations in water soluble fertilizers
- Case study: Updating production plants
- Modularisation of potash production

SUPPLEMENT - LATIN AMERICA

- Trends in Brazil's import markets
- Production facilities in Latin America
- Key crops and nutrient requirements

July/August issue

Advertising due date - **13 June 2025**

Special Focus - CLEAN AMMONIA

- Clean ammonia for agricultural uses
- Hydrogen transport and infrastructure
- Case study: Blue ammonia

SUPPLEMENT - MIDDLE-EAST

- Impact on fertilizers from Middle-East conflicts
- GCC investments
- Regional innovative technologies

September/October issue

Advertising due date - **11 August 2025**

Special Focus - FERTILIZER SUSTAINABILITY

- Soil health and balancing carbon emissions
- Balancing food security with sustainability
- Greener SOP production

SUPPLEMENT - EUROPE

- Sulphur demand and supply in Europe
- CBAM update
- Sustainable nutrients market in Europe

November/December issue

Advertising due date - **10 October 2025**

Special Focus - THE FERTILIZER ECONOMY

- The impact of geopolitics and trade legislation
- The changing landscape of US phosphate import duties on Morocco
- Fertilizer price volatility outlook

SUPPLEMENT - NORTH AMERICA

- One year on: US election and the impact on agriculture
- Mexican fertilizer transport routes
- Canadian import market trends

Distribution

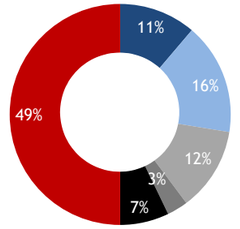
Sector leading digital and hard copy distribution

Published six times a year, the magazine is read by subscribers in over 90 countries. Fertilizer Focus has a unique, best in class distribution, benefiting from Argus' unrivaled presence in the fertilizer sector - **the digital circulation of the magazine in late 2024 was nearly 15,000 - and is growing substantially each month.** Around two thirds of our digital recipients are paying subscribers of Argus fertilizer price reporting and outlook services. This encompasses executives and decision makers in all of the major fertilizer producers, traders, importers and buyers, as well as sector focused financial institutions, shippers, engineering companies, plant contractors, government agencies and trade associations. Our key magazine features are promoted on leading social media platforms (LinkedIn, Twitter, Facebook)

Reader profile

Our unique and unrivaled circulation means your messages reach the industry's most important decision makers.

% of all Fertilizer Focus recipients with the following in their job title



- Executive, President, Director, Vice President
- Manager, Head, Consultant, Advisor
- Sales, Commercial, Marketing, Supply
- Procurement, Buyer, Purchaser, Sourcing, Business Development
- Analyst, Intelligence, Strategy, Accountant, Finance, Investor Relations, Economics
- Other

Unique event distribution

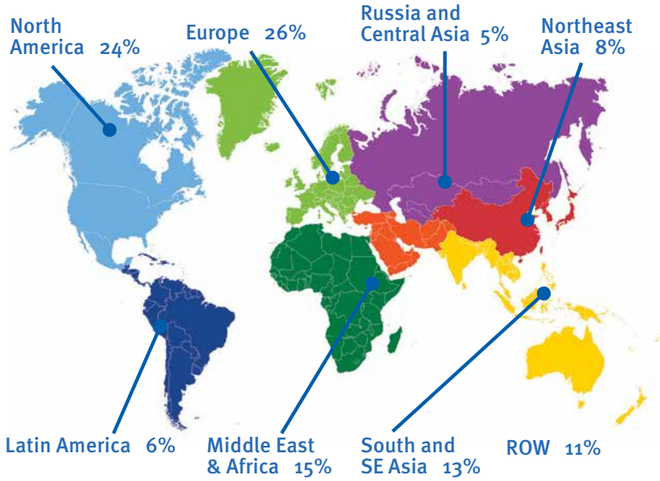
Fertilizer Focus is distributed to every one of the thousands of delegates attending Argus' fertilizer conferences around the world, and available at all of the major global and regional industry events.

Fertilizer Focus will continue to give you unrivaled events positioning. The pandemic temporarily restricted the ability of Argus and other events organizers to deliver physical events, but this is changing. Argus' industry leading conferences are returning in their traditional physical format and our magazine will be delivered to registrants at both physical and digital conferences.

Global distribution breakdown

Our geographic distribution is aligned with the broader Argus fertilizer customer base.

Regional distribution of Fertilizer Focus recipients



Argus events

- Fertilizer Latino Americano (FLA)
- Argus Asia Fertilizer
- Argus East Europe Fertilizer
- Argus Europe Fertilizer
- Argus Clean Ammonia
- Argus Vehicle Emissions and DEF Summit USA
- Argus Paris Grain Conference
- Argus Green Marine Fuels Conference

Global and regional industry events

- AFA Annual Fertilizer Forum & Exhibition, Egypt
- FAI Annual Seminar, India
- IFA Annual Conference
- IFA Crossroads
- Southwest Fertilizer, USA
- TFI Annual Meeting, USA
- TFI World Fertilizer, USA

Advertising rates 2025

Cover rates	
	USD
Outside front package	6,000
Inside front cover	3,740
Inside back cover	3,530
Outside back cover	4,080

Run of press rates	1 Issue	2 Issues (10% discount)	3 -5 Issues (20% discount)	6 Issues (30% discount)
	USD	USD	USD	USD
Double page	6,460	5,748	5,100	4,464
Full page	3,120	2,808	2,496	2,184
Half page	2,640	2,376	2,112	1,848
Third page	1,860	1,674	1,488	1,302
Quarter page	1,740	1,566	1,392	1,218

For more details or to discuss our requirements please contact
Stefan Worsley: **stefan.worsley@argusmedia.com**

Advertising specifications

Editorial & advertising schedule 2025	
Edition	Due date
January/February	6 December
March/April	14 February
Maj/June	11 April
July/August	13 June
September/October	11 August
November/December	10 October

SIZE & POSITION

Once you have booked your advertisement please ensure you supply the artwork at the correct size, as below. Please note: 'Trim size' is the actual size that the advertisement will appear in the publication. 'Bleed size' is the size your advertisement needs to be supplied to us including the required 3mm bleed (if full page). 'Type area' is the suggested area that any text or important information should sit within to ensure details have some clear space around them for clarity.

TECHNICAL SPECIFICATION

Please ensure your advertisement is produced professionally, and in accordance with the following criteria:

- All artwork should be CMYK colour (No Pantone/Spot colours)
- All fonts should be embedded or outlined
- All images within the artwork must be at least 300dpi resolution and in CMYK colour
- For Full Page adverts please include 3mm bleed and crop marks

FILE FORMAT & SUPPLY

Our preferred file type is a high resolution PDF to the the following specification when exported from Adobe InDesign:

- Adobe PDF Preset: PDF/X-4:2008
- Colour Profile: Coated FOGRA39 (ISO 12647-2:2004)

The above will ensure your advertisement appears in the best possible quality, however if you are unable to supply as a PDF we will accept a 300dpi JPEG or TIFF file in CMYK colour format.

Full page

Trim size:
297mm(h) x 210mm(w)
Bleed size:
303mm(h) x 216mm(w)
Type area:
275mm(h) x 185mm(w)

HALF PAGE (Horizontal)

Trim size:
128mm(h) x 180mm(w)
Type area:
118mm(h) x 170mm(w)

HALF PAGE (Vertical)

Trim size:
250mm(h) x 86mm(w)
Type area:
240mm(h) x 76mm(w)

THIRD PAGE (Horizontal)

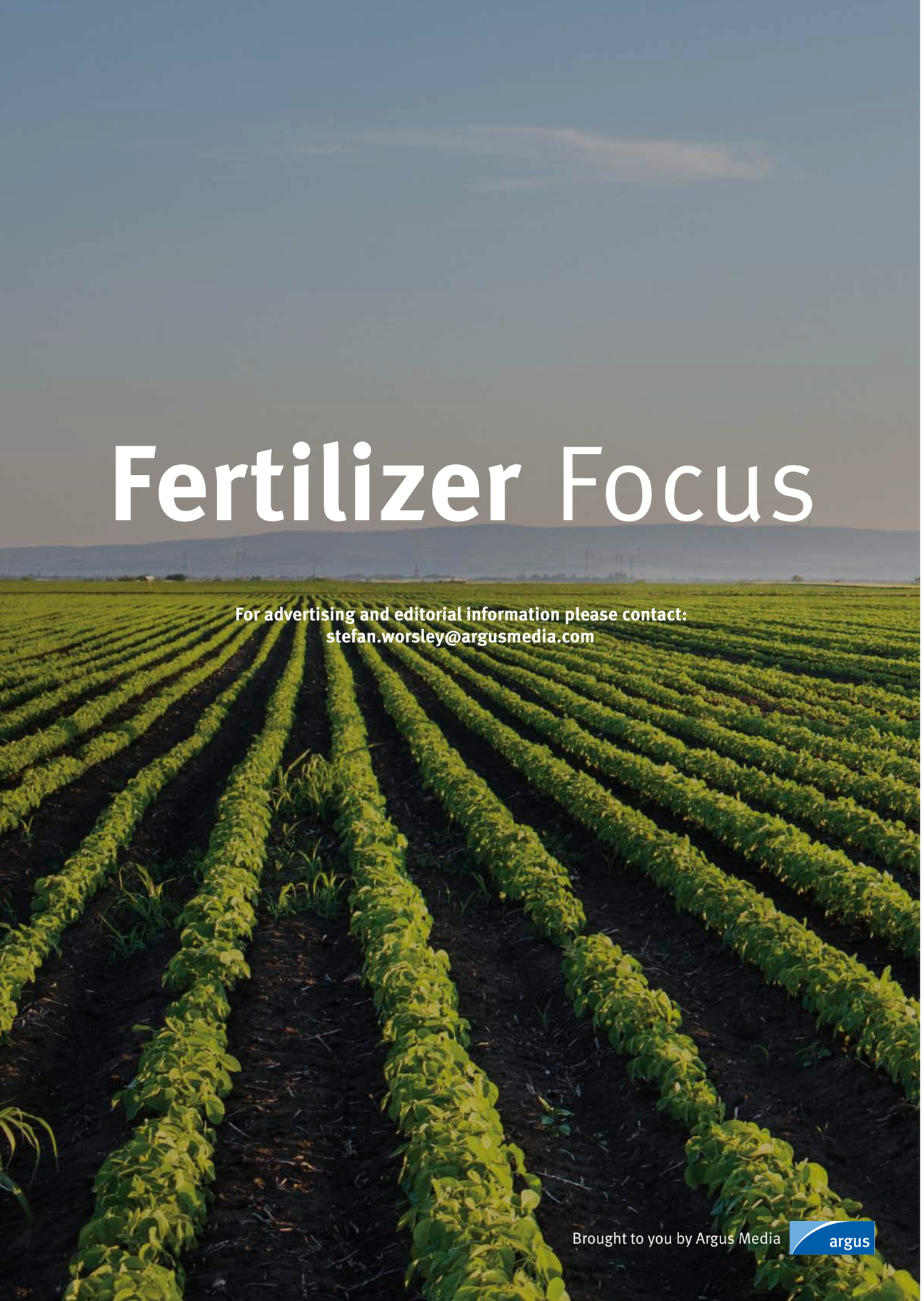
Trim size:
62mm(h) x 180mm(w)
Type area:
54mm(h) x 172mm(w)

THIRD PAGE (Vertical)

Trim size:
122mm(h) x 112mm(w)
Type area:
114mm(h) x 104mm(w)

Please note: Bleed is not required for Half Page and Third Page advertisements as these formats sit within the page, however we do recommend your advertisement includes a keyline/border if it has a white background.

If you have any queries regarding our specifications or to send us your files, please contact: **Kate.Shanley@argusmedia.com**



Fertilizer Focus

INDEX TO ADVERTISERS

argus
argusmedia.com

Fertilizer Focus
Argus
Lacon House, 84 Theobald's Road,
London, WC1X 8NL
Tel: +44 (0)20 7780 4340
Email: fertilizer@argusmedia.com
www.argusmedia.com/fertilizer

Publisher:
Adrian Binks

Editor:
Stefan Worsley
stefan.worsley@argusmedia.com

Contributors:
Meena Chauhan, Sophie Mason, Claira Lloyd, and David Riley

Production:
Ernest Worsley Publishing Ltd
www.ernestworsleypublishing.com

Design:
David Barden Creative Ltd
www.davidbardencreative.co.uk

ISSN 2631-7591

IN THE NEXT ISSUE...

SPECIAL FOCUS: LOW CARBON FERTILIZERS

- Adapting fertilizer production for decarbonisation
- Low carbon nitrogen processes
- Next generation enhanced efficiency fertilizers

SUPPLEMENT: ASIA

- The Asian sulphur markets
- Future growth in India
- Key transport routes

argusmedia.com

Complimentary fertilizer market content from Argus

White papers | Production and trade flow maps | Webinars | Podcasts and Blogs | News

WHITE PAPERS

Learn more about key market issues and trends with Argus white papers, incorporating data and analysis from our services.

TRADE AND PRODUCTION MAPS

Access valuable, visual data on production capacities, trade flows and more for selected countries and regions.

WEBINARS

Benefit from key insight and analysis from our market experts as they present the Argus view of current market tends and outlooks.

BLOGS AND PODCASTS

Discover the Argus view on current and interesting market trends through our easy-to-digest podcast episodes and blog posts.

NEWS AND MARKET UPDATES

Keep your finger on the pulse of current market developments with a selection of the latest news articles from our global editorial team.

Argus' complimentary fertilizer market content is produced by our industry experts, and offers great insight into the market dynamics and outlooks for key fertilizer sectors.

Visit **www.argusmedia.com/fertilizer** to access our complimentary content.

For more information please contact us: fertilizer-m@argusmedia.com www.argusmedia.com/fertilizer

Fertilizer
illuminating the markets

Market Reporting
Consulting
Events