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ARGUS SUSTAINABLE AND SPECIALTY FERTILIZERS

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The most up-to-date *Argus Sustainable and Specialty Fertilizers* methodology is available on www.argusmedia.com

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Methodology overview

Methodology rationale

Argus strives to construct methodologies that reflect the way the market trades. Argus aims to produce price assessments which are reliable and representative indicators of commodity market values and are free from distortion. As a result, the specific currencies, volume units, locations and other particulars of an assessment are determined by industry conventions.

In the sustainable and specialty fertilizers markets, Argus publishes physical market prices in the open market as laid out in the specifications and methodology guide. Argus uses the trading period deemed by Argus to be most appropriate, in consultation with industry, to capture market liquidity.

In order to be included in the assessment process, deals must meet the minimum volume, delivery, timing and specification requirements in our methodology. In illiquid markets, and in other cases where deemed appropriate, Argus assesses the range within which product could have traded by applying a strict process outlined later in this methodology.

Survey process

Argus price assessments are informed by information received from a wide cross section of market participants, including producers, consumers and intermediaries. Argus reporters engage with the industry by proactively polling participants for market data. Argus will contact and accept market data from all credible market sources including front and back office of market participants and brokers. Argus will also receive market data from electronic trading platforms and directly from the back offices of market participants. Argus will accept market data by telephone, instant messenger, email or other means.

Argus encourages all sources of market data to submit all market data to which they are a party that falls within the Argus stated methodological criteria for the relevant assessment. Argus encourages all sources of market data to submit transaction data from back office functions.

Throughout all markets, Argus is constantly seeking to increase the number of companies willing to provide market data. Reporters are mentored and held accountable for expanding their pool of contacts. The number of entities providing market data can vary significantly from day to day based on market conditions.

For certain price assessments identified by local management, if more than 50pc of the market data involved in arriving at a price assessment is sourced from a single party the supervising editor will engage in an analysis of the market data with the primary reporter to ensure that the quality and integrity of the assessment has not been affected.

Market data usage

In each market, Argus uses the methodological approach deemed to be the most reliable and representative for that market. Argus will utilise various types of market data in its methodologies, to include:

- Transactions
- Bids and offers
- Other market information, to include spread values between grades, locations, timings, and many other data.

In many markets, the relevant methodology will assign a relatively higher importance to transactions over bids and offers, and a relatively higher importance to bids and offers over other market information. Certain markets however will exist for which such a hierarchy would produce unreliable and non-representative price assessments, and so the methodology must assign a different relative importance in order to ensure the quality and integrity of the price assessment. And even in markets for which the hierarchy normally applies, certain market situations will at times emerge for which the strict hierarchy would produce non-representative prices, requiring Argus to adapt in order to publish representative prices.

Verification of transaction data

Reporters carefully analyse all data submitted to the price assessment process. These data include transactions, bids, offers, volumes, counterparties, specifications and any other information that contributes materially to the determination of price. This high level of care described applies regardless of the methodology employed. Specific to transactions, bids, and offers, reporters seek to verify the price, the volume, the specifications, location basis, and counterparty. In some transactional average methodologies, reporters also examine the full array of transactions to match counterparties and arrive at a list of unique transactions. In some transactional average methodologies, full details of the transactions verified are published electronically and are accessible by subscribers. The deals are also published in the daily report.

Several tests are applied by reporters in all markets to transactional data to determine if it should be subjected to further scrutiny. If a transaction has been identified as failing such a test, it will receive further scrutiny. For assessments used to settle derivatives and for many other assessments, Argus has established internal procedures that involve escalation of inquiry within the source's company and escalating review within Argus management. Should this process determine that a transaction should be excluded from the price assessment process, the supervising editor will initiate approval and, if necessary, documentation procedures.

Primary tests applied by reporters

- Transactions not transacted at arm's length, including deals between related parties or affiliates.
- Transaction prices that deviate significantly from the mean of all transactions submitted for that day.
- Transaction prices that fall outside of the generally observed lows and highs that operated throughout the trading day.
- Transactions that are suspected to be a leg of another transaction or in some way contingent on an unknown transaction.
- Single deal volumes that significantly exceed the typical transaction volume for that market.
- Transaction details that are identified by other market participants as being for any reason potentially anomalous and perceived by Argus to be as such.

- Transaction details that are reported by one counterparty differently than the other counterparty.
- Any transaction details that appear to the reporter to be illogical or to stray from the norms of trading behaviour. This could include but is not limited to divergent specifications, unusual delivery location and counterparties not typically seen.
- Transactions that involve the same counterparties, the same price and delivery dates are checked to see that they are separate deals and not one deal duplicated in Argus records.

Secondary tests applied by editors for transactions identified for further scrutiny

Transaction tests

- The impact of linkage of the deal to possible other transactions such as contingent legs, exchanges, options, swaps, or other derivative instruments. This will include a review of transactions in markets that the reporter may not be covering.
- The nature of disagreement between counterparties on transactional details.
- The possibility that a deal is directly linked to an offsetting transaction that is not publicly known, for example a “wash trade” which has the purpose of influencing the published price.
- The impact of non-market factors on price or volume, including distressed delivery, credit issues, scheduling issues, demurrage, or containment.

Source tests

- The credibility of the explanation provided for the outlying nature of the transaction.
- The track record of the source. Sources will be deemed more credible if they
 - Regularly provide transaction data with few errors.
 - Provide data by Argus' established deadline.
 - Quickly respond to queries from Argus reporters.
 - Have staff designated to respond to such queries.
- How close the information receipt is to the deadline for information, and the impact of that proximity on the validation process.

Assessment guidelines

When insufficient, inadequate, or no transaction information exists, or when Argus concludes that a transaction based methodology will not produce representative prices, Argus reporters will make an assessment of market value by applying intelligent judgement based on a broad array of factual market information. Reporters must use a high degree of care in gathering and validating all market data used in determining price assessments, a degree of care equal to that applying to gathering and validating transactions. The information used to form an assessment could include deals done, bids, offers, tenders, spread trades, exchange trades, fundamental supply and demand information and other inputs.

The assessment process employing judgement is rigorous, replicable, and uses widely accepted valuation metrics. These valuation

metrics mirror the process used by physical commodity traders to internally assess value prior to entering the market with a bid or offer. Applying these valuation metrics along with sound judgement significantly narrows the band within which a commodity can be assessed, and greatly increases the accuracy and consistency of the price series. The application of judgement is conducted jointly with the supervising editor, in order to be sure that guidelines below are being followed. Valuation metrics include the following:

Relative value transactions

Frequently transactions occur which instead of being an outright purchase or sale of a single commodity, are instead exchanges of commodities. Such transactions allow reporters to value less liquid markets against more liquid ones and establish a strong basis for the exercise of judgment.

- Exchange one commodity for a different commodity in the same market at a negotiated value.
- Exchange delivery dates for the same commodity at a negotiated value.
- Exchange a commodity in one location for the same commodity at another location at a negotiated value.

Bids and offers

If a sufficient number of bids and offers populate the market, then in most cases the highest bid and the lowest offer can be assumed to define the boundaries between which a deal could be transacted.

Comparative metrics

- The relative values between compared commodities are readily discussed in the market and can be discovered through dialogue with market participants. These discussions are the precursor to negotiation and conclusion of transactions.
- Comparison to the same commodity in another market centre.
- Comparison to a more actively traded but slightly different specification commodity in the same market centre.
- Comparison to the same commodity traded for a different delivery timing.
- Comparison to the commodity's primary feedstock or primary derived product(s).
- Comparison to trade in the same commodity but in a different modality (as in barge versus oceangoing vessel) or in a different total volume (as in full cargo load versus partial cargo load).

Volume minimums and transaction data thresholds

Argus typically does not establish thresholds strictly on the basis of a count of transactions, as this could lead to unreliable and non-representative assessments and because of the varying transportation infrastructure found in all commodity markets. Instead, minimum volumes are typically established which may apply to each transaction accepted, to the aggregate of transactions, to transactions which set a low or high assessment or to other volumetrically relevant parameters.

For price assessments used to settle derivatives, Argus will seek to establish minimum transaction data thresholds and when no such threshold can be established Argus will explain the reasons. These

thresholds will often reflect the minimum volumes necessary to produce a transaction-based methodology, but may also establish minimum deal parameters for use by a methodology that is based primarily on judgement.

Should no transaction threshold exist, or should submitted data fall below this methodology's stated transaction data threshold for any reason, Argus will follow the procedures outlined elsewhere in this document regarding the exercise of judgement in the price assessment process.

Transparency

Argus values transparency in energy markets. As a result, where available, we publish lists of deals in our reports that include price, basis, counterparty and volume information. The deal tables allow subscribers to cross check and verify the deals against the prices. Argus feels transparency and openness is vital to developing confidence in the price assessment process.

Swaps and forwards markets

Argus publishes forward assessments for numerous markets. These include forward market contracts that can allow physical delivery and swaps contracts that swap a fixed price for the average of a floating published price. Argus looks at forward swaps to inform physical assessments but places primary emphasis on the physical markets.

Publications and price data

Argus sustainable and specialty fertilizer prices are published in the Argus Sustainable and Specialty Fertilizers report. Subsets of these prices appear in other Argus market reports and newsletters in various forms. The price data are available independent of the text-based report in electronic files that can feed into various databases. These price data are also supplied through various third-party data integrators. The Argus website also provides access to prices, reports and news with various web-based tools. All Argus prices are kept in a historical database and available for purchase. Contact your local Argus office for information.

A publication schedule is available at www.argusmedia.com

Corrections to assessments

Argus will on occasion publish corrections to price assessments after the publication date. We will correct errors that arise from clerical mistakes, calculation errors, or a misapplication of our stated methodology. Argus will not retroactively assess markets based on new information learned after the assessments are published. We make our best effort to assess markets based on the information we gather during the trading day assessed.

Ethics and compliance

Argus operates according to the best practices in the publishing field, and maintains thorough compliance procedures throughout the firm. We want to be seen as a preferred provider by our subscribers, who are held to equally high standards, while at the same time maintaining our editorial integrity and independence. Argus has a strict ethics policy that applies to all staff. The policy can be

found on our website at www.argusmedia.com. Included in this policy are restrictions against staff trading in any energy commodity or energy related stocks, and guidelines for accepting gifts. Argus also has strict policies regarding central archiving of email and instant messenger communication, maintenance and archiving of notes, and archiving of spreadsheets and deal lists used in the price assessment process. Argus publishes prices that report and reflect prevailing levels for open-market arms length transactions (please see the [Argus Global Compliance Policy](#) for a detailed definition of arms length).

Consistency in the assessment process

Argus recognises the need to have judgement consistently applied by reporters covering separate markets, and by reporters replacing existing reporters in the assessment process. In order to ensure this consistency, Argus has developed a programme of training and oversight of reporters. This programme includes:

- A global price reporting manual describing among other things the guidelines for the exercise of judgement
- Cross-training of staff between markets to ensure proper holiday and sick leave backup. Editors that float between markets to monitor staff application of best practices
- Experienced editors overseeing reporting teams are involved in daily mentoring and assisting in the application of judgement for illiquid markets
- Editors are required to sign-off on all price assessments each day, thus ensuring the consistent application of judgement.

Review of methodology

The overriding objective of any methodology is to produce price assessments which are reliable and representative indicators of commodity market values and are free from distortion. As a result, Argus editors and reporters are regularly examining our methodologies and are in regular dialogue with the industry in order to ensure that the methodologies are representative of the market being assessed. This process is integral with reporting on a given market. In addition to this ongoing review of methodology, Argus conducts reviews of all of its methodologies and methodology documents on at least an annual basis.

Argus market report editors and management will periodically and as merited initiate reviews of market coverage based on a qualitative analysis that includes measurements of liquidity, visibility of market data, consistency of market data, quality of market data and industry usage of the assessments. Report editors will review:

- Appropriateness of the methodology of existing assessments
- Termination of existing assessments
- Initiation of new assessments.

The report editor will initiate an informal process to examine viability. This process includes:

- Informal discussions with market participants
- Informal discussions with other stakeholders
- Internal review of market data

Should changes, terminations, or initiations be merited, the report editor will submit an internal proposal to management for review and approval. Should changes or terminations of existing assessments be approved, then formal procedures for external consultation are begun.

Changes to methodology

Formal proposals to change methodologies typically emerge out of the ongoing process of internal and external review of the methodologies. Formal procedures for external consultation regarding material changes to existing methodologies will be initiated with an announcement of the proposed change published in the relevant Argus report. This announcement will include:

- Details on the proposed change and the rationale
- Method for submitting comments with a deadline for submissions
- For prices used in derivatives, notice that all formal comments will be published after the given consultation period unless submitter requests confidentiality.

Argus will provide sufficient opportunity for stakeholders to analyse and comment on changes, but will not allow the time needed to follow these procedures to create a situation wherein unrepresentative or false prices are published, markets are disrupted, or market participants are put at unnecessary risk. Argus will engage with industry throughout this process in order to gain acceptance of proposed changes to methodology. Argus cannot however guarantee universal acceptance and will act for the good order of the market and ensure the continued integrity of its price assessments as an overriding objective.

Following the consultation period, Argus management will commence an internal review and decide on the methodology change. This will be followed by an announcement of the decision, which will be published in the relevant Argus report and include a date for implementation. For prices used in derivatives, publication of stakeholders' formal comments that are not subject to confidentiality and Argus' response to those comments will also take place.

Publishing schedule

Argus Sustainable and Specialty Fertilizers is published weekly on Wednesdays. A publication schedule is available at www.argusmedia.com.

Currency/unit

Prices are published in US dollars per metric tonne (\$/t) unless otherwise specified.

Timing and price ranges

Unless otherwise specified, prices are assessed and published weekly as a low-high range of prices since the last assessment.

Assessed prices

NOP

China domestic ex-works (Yn/t)

Prices are for no more than 1,000t in truck-size shipments.

fob China (\$/t)

The assessment includes both fertiliser- and industrial-grade NOP.

Delivered wholesale northwest Europe

Prices are for at least 100t in 25kg bags, palletised and delivered to the wholesaler's warehouse.

Delivered wholesale Spain

Prices are for at least 100t in 25kg bags, palletised and delivered to the wholesaler's warehouse.

cfr Turkey

Prices are for 100-2,000t in 25kg bags in containers or big bags.

cfr India

Prices are for 100-2,000t in 25kg bags in containers or big bags.

cfr east coast Mexico

Prices are for 100-2,000t in 25kg bags in containers or big bags.

cfr west coast Mexico

Prices are for 100-2,000t in 25kg bags in containers or big bags. Information about trade done as part of a larger bulk shipment may be considered for inclusion in the assessment if considered relevant to the price of container trade.

cfr Brazil

Prices are for 100-2,000t in 25kg bags in containers or big bags.

Specification

- **Purity:** 99.4pc
- **K2O:** 46pc min
- **N:** 13.5pc min
- **Chlorides (Cl-):** 0.1pc max
- **Sulphates (SO4):** 0.01pc max
- **Moisture:** 0.2pc max
- **Insoluble matter in water:** 0.1pc max
- **Appearance:** white powder

Technical MAP (tMAP)

fob China 12-61

Prices are for 100-2,000t in containers produced via the wet process to make phosphoric acid.

China ex works (Yn/t)

Prices are for no more than 1,000t in truck-size or rail shipments. Trucking is normally in 25kg, 50kg and 1t bags. Railing is in 25kg and 50kg bags.

cfr India

Prices are for 25-500t in 25kg bags in containers or big bags.

cfr Brazil 12-61

Prices are for 100-2,000t in 25kg bags in containers or big bags.

cfr east coast Mexico 12-61

Prices are for 100-2,000t in 25kg bags in containers or big bags.

cfr west coast Mexico 12-61

Prices are for 100-2,000t in 25kg bags in containers or big bags. Information about trade done as part of a larger bulk shipment may be considered for inclusion in the assessment if considered relevant to the price of container trade.

Delivered wholesale northwest Europe 12-61 (€/t)

Prices are for at least 100t lots in 25kg bags, palletised and delivered to the wholesaler's warehouse.

Delivered wholesaler Spain 12-61 (€/t)

Prices are for at least 100t lots in 25kg bags, palletised and delivered to the wholesaler's warehouse.

cfr Turkey

Prices are for 100-2,000t in 25kg bags in containers or big bags.

cfr east coast US

Prices are for 100-2,000t in 25kg bags in containers or big bags.

cfr west coast US

Prices are for 100-2,000t in 25kg bags in big bags in containers.

Specification

- **P2O5:** 61pc
- **N:** 12pc min
- **Moisture:** 0.2pc max
- **Insoluble matter in water:** 0.1pc max
- **Appearance:** off-white colour

Water-soluble SOP

fob Egypt

Prices are for 25kg bags in containers.

fob east Asia

Prices cover exports from China's mainland and Taiwan.

fob northwest Europe bagged

Prices include those northwest Europe as well as Italy and Austria.

cfr Brazil

Prices are typically for 100-2,000t in 25kg bags in big bags in containers. Larger amounts can also come in bulk.

Specification

- **K2O:** 50pc min
- **S:** 18pc min
- **Cl:** 1pc max
- **Moisture:** 0.15pc max
- **Insoluble matter in water:** 0.1pc max
- **Appearance:** white-coloured powder

Calcium nitrate (CN)

fob China

Prices are for 100-2,000t in 25kg bags in containers or big bags.

cfr India

Prices are typically for 25-500t in 25kg bags in containers or big bags.

Specification

- **Purity:** 99pc min
- **N:** 15.5pc min
- **Calcium:** 26pc min
- **Chlorides (Cl-):** 0.005pc max
- **Sulphates (SO4):** 0.03pc max
- **Insoluble matter in water:** 0.01pc max
- **Appearance:** white granular

Mono potassium phosphate (MKP)

fob China

Prices are for 100-2,000t in 25kg bags in containers or big bags.

cfr India

Prices are typically for 25-500t lots in 25kg bags in containers or big bags.

cfr Brazil

Prices are for 100-2,000t in 25kg bags in containers or big bags although the typical volume range is 100-1,000t.

Specification

- **Purity:** 99pc min
- **P2O5:** 51.5pc min
- **K2O:** 33.9pc min
- **Chlorides (Cl-):** 0.2pc max
- **Insoluble matter in water:** 0.2pc max
- **Appearance:** white crystalline

Water-soluble NPKs (19-19-19)

cfr India

Prices are for 25-500t in 25kg bags in containers or big bags.

Specification

NPK 19-19-19 is a water-soluble fertilizer containing 19pc nitrogen, 19pc phosphates and 19pc potash by weight. It is freely soluble in water and is best for drip irrigation and foliar application.

- **Moisture:** 0.5-1.5pc
- **Appearance:** white crystalline powder
- **Solubility:** 100pc
- **pH (1% solution):** slightly acidic to neutral (3.5-6.0)

CAN production costs

Northwest Europe

Argus publishes calculated ammonium nitrate (CAN) production costs based on Argus assessments and assumption about the costs of various import and production pathways.

See the [Argus Nitrogen methodology](#).

Ammonium thiosulphate

- fot US corn belt
- fot US southern plains

See the [Argus North American Fertilizer methodology](#).

Inhibited urea

- cif inland Germany
- delivered UK (bagged)

See the [Argus Fertilizer Europe methodology](#)

Carbon-adjusted fertilizer prices

Calculated as the underlying fertilizer price plus the cost of spot EU ETS credits required to offset the CO2 emitted in the production of the finished fertilizer and its raw materials.

Urea granular bulk fca northwest Europe

French Atlantic fca granular urea + CO2 assuming 1.703t CO2/t urea produced.

UAN 30pc fca northwest Europe

Urea ammonium nitrate (UAN) 30pc fca Rouen + CO2 assuming 1.32 t CO2/t UAN produced.

AN 34pc bagged fca northwest Europe

Ammonium nitrate (AN) 34pc fca bagged France + CO2 assuming 1.112t CO2/t AN produced.

DAP fot/fob northwest Europe duty paid/free

Diammonium phosphate (DAP) bulk fot/fob Benelux duty paid/free + CO2 assuming 0.47t CO2/t DAP produced.

AS granular/caprolactam grade fob northwest Europe

The ammonium sulphate (AS) bulk fob northwest Europe (granular/caprolactam) price plus the prompt EU ETS price assuming 0.51t CO2/t AS produced.

See the [Argus Carbon](#), [Argus Nitrogen](#) and [Argus Phosphates](#) methodologies for information about underlying prices.

Low-carbon fertilizers

Calculated prices for fertilizers produced using US low-carbon ammonia.

Japan, Korea low-carbon ammonia

Calculated delivered prices for US ammonia delivered to Ulsan, South Korea and Niihama, Japan based on US Gulf coast ammonia costs plus freight. See the [Argus Hydrogen and Future Fuels methodology](#).

Northwest Europe AN (cif inland) – US Gulf low-C ammonia-based

Calculated as the low-C ATR+CCS US Gulf coast ammonia cost (including capex) plus the value of a US 45Q tax credit plus the cost of shipment to a northwest Europe production plant, production and other costs, converted to €/t.

Assumes:

Freight: gas carrier ammonia Point Lisas to Antwerp (25,300t) MGC rate + \$12.50/t to adjust for the longer voyage from the US Gulf + \$5/t for delivery to the AN production plant.

Ammonia consumption: 0.42t ammonia per tonne of AN

Production cash cost: \$122.40/t

Additional costs: the additional cost of renewable power is priced at the Texas Green-e renewable energy certificates price for the most recent vintage year.

Assumptions are reviewed annually, at the beginning of the fourth quarter. See the [Argus Air Daily](#), [Argus Gas Freight](#) and [Argus Hydrogen and Future Fuels](#) methodologies for information about underlying prices.

Carbon-adjusted northwest Europe AN (cif inland) – US Gulf low-C ammonia-based

The northwest Europe AN (cif inland) – US Gulf low-C ammonia-based price described above + the EU ETS spot CO₂ allowance price assuming 0.36t CO₂/t AN produced.

See the [Argus Carbon methodology](#).

Northwest Europe CAN (cif inland) – US Gulf low-C ammonia-based

Calculated as the low-C ATR+CCS US Gulf coast ammonia cost (including capex) plus the value of a US 45Q tax credit plus the cost of shipment to a northwest Europe production plant, production and other costs, converted to €/t.

Assumes:

Freight: gas carrier ammonia Point Lisas to Antwerp (25,300t) MGC rate + \$12.50/t to adjust for the longer voyage from the US Gulf + \$5/t for delivery to the CAN production plant.

Ammonia consumption: 0.35t ammonia per tonne of CAN

Production cash cost: \$122.10/t

Additional costs: the additional cost of renewable power is priced at the Texas Green-e renewable energy certificates price for the most recent vintage year.

Assumptions are reviewed annually, at the beginning of the fourth quarter. See the [Argus Air Daily](#), [Argus Gas Freight](#) and [Argus Hydrogen and Future Fuels](#) methodologies for information about underlying prices.

Carbon-adjusted northwest Europe CAN (cif inland) – US Gulf low-C ammonia-based

The northwest Europe CAN (cif inland) – US Gulf low-C ammonia-based price described above + the EU ETS spot CO₂ allowance price assuming 0.3t CO₂/t CAN produced.

See the [Argus Carbon methodology](#).

Northwest Europe AS (cif inland) – US Gulf low-C ammonia-based

The price of fob northwest Europe ammonium sulphate (granular caprolactam) produced using low-carbon ammonia imported from the US Gulf rather than conventional ammonia sourced in northwest Europe.

The cost of low-carbon ammonia is assumed to be the low-C ATR+CCS US Gulf coast ammonia cost (including capex) plus the value of a US 45Q tax credit plus the cost of shipment to a northwest Europe production plant. Low-carbon ammonia is assumed to replace conventional ammonia at the cfr northwest Europe including duty price.

Assumes:

Freight: gas carrier ammonia Point Lisas to Antwerp (25,300t) MGC rate + \$12.50/t to adjust for the longer voyage from the US Gulf + \$5/t for delivery to the AS production plant.

Ammonia consumption: 0.26t ammonia per tonne of AS

Additional costs: the additional cost of renewable power is priced at the Texas Green-e renewable energy certificates price for the most recent vintage year.

Assumptions are reviewed annually, at the beginning of the fourth quarter. See the [Argus Air Daily](#), [Argus Gas Freight](#), [Argus Hydrogen and Future Fuels](#) and [Argus Nitrogen](#) methodologies for information about underlying prices.

Carbon-adjusted northwest Europe AS (cif inland) – US Gulf low-C ammonia-based

The northwest Europe AS (cif inland) – US Gulf low-C ammonia-based price described above + the EU ETS spot CO₂ allowance price assuming 0.03t CO₂/t AS produced.

See the [Argus Carbon methodology](#).

fob Morocco DAP – US Gulf low-C ammonia-based

The price of fob Morocco DAP produced using low-carbon ammonia imported from the US Gulf rather than conventional ammonia sourced in north Africa.

The cost of low-carbon ammonia is assumed to be the low-C ATR+CCS US Gulf coast ammonia cost (including capex) plus the value of a US 45Q tax credit plus the cost of shipment to a Moroccan production plant. Low-carbon ammonia is assumed to replace conventional ammonia at the cfr north Africa price.

Assumes:

Freight: gas carrier ammonia Point Lisas to Jorf Lasfar (25,300t) MGC rate + \$12.50/t to adjust for the longer voyage from the US Gulf.

Ammonia consumption: 0.23t ammonia per tonne of DAP

Additional costs: the additional cost of renewable power is priced at the Texas Green-e renewable energy certificates price for the most recent vintage year.

Assumptions are reviewed annually, at the beginning of the fourth quarter. See the [Argus Air Daily](#), [Argus Gas Freight](#), [Argus Hydrogen and Future Fuels](#) and [Argus Phosphates](#) methodologies for information about underlying prices.

Delivered northwest Europe DAP – Moroccan-produced US Gulf low-C ammonia-based

Calculated as the fob Morocco DAP – US Gulf low-C ammonia-based price described above plus the freight rate for dry urea Algeria to French Bay 12,000t.

See the [Argus Nitrogen methodology](#).

Carbon-adjusted delivered northwest Europe DAP – Moroccan-produced US Gulf low-C ammonia-based

The delivered northwest Europe DAP – Moroccan-produced US Gulf low-C ammonia-based price described above + the EU ETS spot CO₂ allowance price assuming 0.03t CO₂/t DAP produced.

See the [Argus Carbon methodology](#).

Organic nutrient values

Calculated nutrient values for the organic element of various fertilizers.

See the [Argus Nitrogen](#), [Argus Phosphates](#) and [Argus Potash](#) methodologies for information about underlying prices.

Europe

3-3-3 (urea based)

Urea granular bulk fca French Atlantic/46 x 3 + DAP Benelux fot/fob duty paid/free P2O5 equiv x 0.3 + potash standard MOP bulk fob northwest Europe 60 x 3

4-4-4 (urea based)

Urea granular bulk fca French Atlantic/46 x 4 + DAP Benelux fot/fob duty paid/free P2O5 equiv x 0.4 + potash standard MOP bulk fob northwest Europe 60 x 4

5-5-5 (urea based)

Urea granular bulk fca French Atlantic/46 x 5 + DAP Benelux fot/fob duty paid/free P2O5 equiv x 0.5 + potash standard MOP bulk fob northwest Europe 60 x 5

3-3-3 (nitrate based)

Ammonium nitrate 34% fca bagged France import/34 x 3 + DAP Benelux fot/fob duty paid/free P2O5 equivalent x 0.3 + potash standard MOP bulk fob northwest Europe/60 x 3

4-4-4 (nitrate based)

Ammonium nitrate 34% fca bagged France import/34 x 4 + DAP Benelux fot/fob duty paid/free P2O5 equivalent x 0.4 + potash standard MOP bulk fob northwest Europe/60 x 4

5-5-5 (nitrate based)

Ammonium nitrate 34% fca bagged France import/34 x 5 + DAP Benelux fot/fob duty paid/free P2O5 equivalent x 0.5 + potash standard MOP bulk fob northwest Europe/60 x 5

Brazil

3-3-3

Urea granular bulk cfr Brazil/46 x 3 + MAP 11-52 cfr Brazil P2O5 equivalent x 0.3 + potash granular MOP bulk cfr Brazil/60 x 3

4-4-4

Urea granular bulk cfr Brazil/46 x 4 + MAP 11-52 cfr Brazil P2O5 equivalent x 0.4 + potash granular MOP bulk cfr Brazil/60 x 4

5-5-5

Urea granular bulk cfr Brazil/46 x 5 + MAP 11-52 cfr Brazil P2O5 equivalent x 0.5 + potash granular MOP bulk cfr Brazil/60 x 5

Sulphates

AS sulphate values

fob China

(Ammonium sulphate bulk fob China (granular caprolactam and compacted) – urea granular bulk fob China /46 x 21)/24

cfr southeast Asia

(Ammonium sulphate bulk cfr southeast Asia (caprolactam) – urea prilled bulk cfr Southeast Asia /46 x 21) /24

cfr Brazil

(Ammonium sulphate bulk cfr Brazil (granular caprolactam and compacted) – urea granular bulk cfr Brazil /46 x 21) /24

fob northwest Europe

Ammonium sulphate bulk fob northwest Europe (granular caprolactam) – urea granular bulk fca French Atlantic /46 x 21)/24

TSP Ca value

cfr Brazil

Phosphate TSP cfr Brazil – MAP 11-52 cfr Brazil P2O5 equivalent x 0.46 / 17pc estimated TSP CA content

SSP Ca value

cfr Brazil

(MAP 11-52 cfr Brazil P2O5 equivalent - MAP 11-52 cfr Brazil P2O5 equivalent x 20pc assumed SSP P2O5 content - (AS sulphate value cfr Brazil x SSP S content estimated at 11pc x 100))/SSP Ca content estimated at 19pc x 100)) / SSP Ca content estimated at 19pc x 100

Derived water-soluble prices

Underlying data

Except where stated, underlying data is sourced from Tradesparq.

Argus solubility premiums are based on third-party data, over which Argus has no control.

Shipment data may be excluded from calculations based on the importer, exporter, product description, price or for other reasons.

New monthly premiums will be published when data availability allows, typically on the first Friday of the calendar month.

Historical prices may be updated if data from Tradesparq is changed after publication.

Publication may cease without notice. A publication schedule is available at www.argusmedia.com.

Monthly average prices

Monthly average import prices are the volume-weighted average of shipments of the specified product from the named origin. China

export prices are derived from the price of product delivered to Peru and Chile less the cost of freight from China.

Potassium nitrate (NOP)

Information about field-grade variants, products destined for industrial applications, and NOP variants mixed with sodium nitrate is excluded.

- Mexico import from Jordan and China
- Peru import from Chile
- India import from all origins

MAP 12-61

Information about non-soluble grades and products destined for industrial applications is excluded.

- China export: calculated from Peru and Chile import data less freight costs to China
- West coast Latin America (Peru, Chile, Mexico) import from all origins
- India import from all origins

Calcium nitrate (CN)

Fertigation grade. Information about field grade (Tropicote), boron-enriched field grade (Nitabor) and ICL-branded product is excluded.

- India import from China
- India import from Norway

MKP

Information about DPK is excluded.

- India import from China
- Mexico import from China
- Mexico import from Israel

NPKs

- 13-40-13 Mexico import from Spain. Includes only shipments of product from Compo Expert (Hakaphos Violeta)
- 15-5-30 Mexico import from Spain. Includes only shipments of product from Compo Expert (Hakaphos Naranja)
- 18-18-18 Mexico import from Spain. Includes only shipments of product from Compo Expert (Hakaphos Rojo)
- 19-19-19 India import from the Netherlands under Yara Del-taspray brand
- 19-19-19 India import from the UAE

Premiums

Chloride-free premium

Argus compares the weighted average price of MOP and SOP imports adjusted for relative nutrient content

- MOP 60% India import: the average of all imports. Information about other grades, organic-certified MOP and products destined for food and industrial applications is excluded.
- SOP India import: the average of all imports

Soluble K2O Premium – India import

SOP: Argus isolates the K2O nutrient value of the SOP India imports described above by assuming an SO3 value derived from the price of caprolactam-grade ammonium sulphate less the nitrogen equivalent price based on Argus prilled urea price assessments adjusted for relative nutrient content.

The calculation uses a 12-month rolling average of the implied SO3 value for Brazil, the Black Sea and the Baltic Sea based on the Argus price assessments of:

- Ammonium sulphate bulk cfr Brazil (caprolactam) spot
- Ammonium sulphate bulk fob Black Sea (caprolactam) spot
- Ammonium sulphate bulk fob Baltic (caprolactam) spot
- Urea prilled bulk cfr Brazil spot
- Urea prilled bulk fob Black Sea spot
- Urea prilled bulk fob Baltic spot

See the [Argus Nitrogen methodology](#)

NOP: Argus isolates the K2O nutrient value of the water-soluble NOP India imports from all sources described above by assuming a nitrate value derived from the price of imports of urea adjusted for relative nutrient content.

The premium is the difference between the resulting K2O nutrient values.

P2O5 – India

Argus isolates the P2O5 nutrient value of water-soluble MAP 12:61 India imports from China described above by assuming a nitrogen value derived from the price of urea imports adjusted for relative nutrient content.

- Prilled Urea import India: imported from all sources, excludes urea for industrial applications
- DAP 18:46 import India: imported from all sources, excludes product for industrial applications

Bulk calculation components

Argus calculates similar monthly averages for use in the calculation of water-soluble premiums to bulk product. Those averages are calculated using Tradeparq data. Underlying monthly averages are not published in the Argus Sustainable and Specialty Fertilizers.