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ARGUS NPKS

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The most up-to-date *Argus NPKs* 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 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 NPKs markets, Argus publishes prices 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, 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 week to week 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 to subscribers. The deals are also published in the weekly 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 week.
- Transaction prices that fall outside of the generally observed lows and highs that operated throughout the trading week.
- 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.
- 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 judgment 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 judgment 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 judgment 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 judgment 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 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.
- Analysis of prices in forward markets for physically deliverable commodity that allow extrapolation of value into the prompt timing for the commodity assessed.
- 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

Because of the varying transportation infrastructure found in all commodity markets, 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. 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 judgment.

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 judgment in the price assessment process.

Transparency

Argus values transparency in markets. As a result, 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 NPK prices are published in the Argus NPKs 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.

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 also correct errors that arise from mistakes made by market participants in reporting transactions. Argus will not retroactively assess markets based on new information learned after the assessments are published.

Ethics and compliance

Argus operates according to the best practices in the publishing field, and maintains thorough compliance procedures through-

out 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 commodities or 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 judgment 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 judgment.
- 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 judgment for illiquid markets.
- Editors are required to sign-off on all price assessments each week, thus ensuring the consistent application of judgment.

Review of methodology

The overriding objective of any methodology is to produce price assessments which are reliable 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 physical 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.

Argus NPKs

Publication frequency

Argus publishes the weekly Argus NPKs report 51 weeks of the year on a Thursday evening. The report is not published for one week during the Christmas/new year holidays in the UK. A full publication schedule is available at www.argusmedia.com.

General methodology

Argus surveys a wide variety of market participants during the course of the week including producers, trader, buyers, sellers and other market analysts. This survey seeks to confirm what trade has been done, by whom, as well as firm bids and offers. The goal is to cross check market transactions from all participants wherever possible. The survey also seeks to ascertain fundamentals data, tender news and supply and demand information. Argus will contact and accept market data from all credible market sources including front and back office of market participants and brokers.

Assessing price ranges

NPK prices are assessed in various regions, countries and within countries on a free on board (fob) basis in the main export regions and on a cost and freight (cfr), cif inland, free carrier (fca) or carriage paid to (cpt) basis in the main destination markets. Deals, bids and offers must be considered repeatable to be reflected in the assessments.

The report seeks to determine price ranges in which transactions are taking place or in which transactions could have taken place between a willing buyer and seller.

When there is sufficient liquidity and deals data are deemed reliable and representative, the price range will be defined on the low and the high end of confirmed deals concluded throughout the trading week. These deals must meet the minimum volumes and strict delivery timing, as well as specifications as laid down in this methodology.

Information on transactions, bids and offers that lie outside the specifications of timing, size, location and quality may be used in assessing price ranges, but deals that lie within these specifications are given most weight.

In markets that periodically lack liquidity, Argus may assess price ranges based on a range of other market information including netbacks to more liquid markets and market fundamentals.

Assessment period

Prices are for the week up to and including the day of publication. Market information received after 4.30pm London time on the day of publication may not be considered for inclusion in the assessment. During periods of high volatility, assessments are weighted towards trading activity later in the week.

Spot, contract and formula pricing

Spot

Spot pricing refers to specific cargoes sold that are scheduled to load within 40 days of the sale being agreed. These prices are cash prices, i.e. net of any credit.

Contract

Contract pricing is split out from spot market assessments and refers to a significant sales volume spread over a minimum three-month shipping period.

Quarterly contract prices are updated when prices for the relevant quarter have been agreed, not necessarily or automatically at the beginning of that quarter.

Formula

Formula pricing is an arrangement where a buyer and seller agree in advance that the price to be paid for a product delivered in the future will be based on a pre-determined calculation, sometimes involving published prices.

Given that the exact nature of the calculation or the agreement between the parties is often private and confidential, and if the deal is considered a one-off (i.e not repeatable) then calculated netbacks are not used in the formulation of a spot price range. However, if a buyer and seller use this method of pricing for multiple transactions on a specific trade route, then the editor may use the deal in formulating a spot price range using current known cfr levels, domestic prices in the destination country and indicative freight rates.

Terms

Some transactions are conducted on a sight/cash basis, but where credit terms apply, e.g. up to 180 days, these are taken into account and subtracted from the price so that the published price is net of credit or other terms.

Units

Prices are assessed in US \$/t, €/t and Ukrainian hryvnia (HRN/t) depending on product and country.

Lot and cargo sizes

For international trade, the minimum lot size is 5,000t of a particular product (including containers for certain prices or part cargoes on larger vessels including other fertilizers and for which the freight rate may be more favourable – although this will be explained in the text).

The exception is prices quoted in the domestic markets of Germany, Spain and Ukraine for which the price assessments are based on cargo sizes of a minimum 100t.

For the NPKs report, Argus considers cargoes as follows — typically short sea routes in Europe (for example from north Africa) employ vessels of 5,000-6,000t. Deepsea voyages employ handy-size vessels and above:

- Minimum 5,000t (for example Mediterranean vessels from north Africa)
- Handysize 10,000-35,000t (the majority of deep sea NPK trade)
- Handymax (35,000-59,000t)
- Panamax (60,000-85,000t plus)

Products and specifications

NPK is a multi-nutrient fertilizer consisting of two or three of the main macronutrients, N, P and K, with certain exceptions. The definition includes:

- NP fertilizers except ammonium phosphates – MAP (11-52-0, 11-44-0 and 10-50-0) and DAP (18-46-0)
- PK fertilizers except potassium phosphates (MKP, DKP)
- NK fertilizers except potassium nitrate

Argus expresses formulations as a function of the varying N, P2O5 and K2O contents of an NPK product, per industry standard

Different NPK formulations are described as a series of three or more figures representing the nutrient content as a percentage of the total fertilizer product.

For example, 15-15-15 is a multi-nutrient fertilizer containing 15pc N, 15pc P2O5 and 15pc K2O.

NPK products often act as carriers for secondary and micronutrients such as sulphur, magnesium, zinc or boron.

The above standard nomenclature for NPK products is extended with a suffix to indicate the additional percentage of secondary and micro-nutrients. For example, 14-23-14+5S+1B contains 14pc N, 23pc P2O5, 14pc K2O, 5pc sulphur and 1pc boron.

There are four main types of production process. Argus assessments are mainly of chemically granulated product. Assessments of bulk blended product are indicated as such in the markets covered section of this methodology.

- Chemical granulation: a slurry-based reaction between ammonia and phosphoric acid. A round granule is formed mainly through accretion. The process allows long runs of one formulation and produces a product that can be shipped over large distances
- Bulk blending: mixing of granular fertilizer materials of a similar size. Raw materials are transported large distances to a blending operation, but the resulting product is not suitable for long-distance shipping.

Markets covered

Spot prices

All \$/t unless otherwise stated.

15-15-15 fob Baltic/Black Sea

Estimated freight rates from major importers may also be taken into account to calculate netbacks.

15-15-15 fob Morocco

Estimated freight rates from major importers may also be taken into account to calculate netbacks.

15-15-15 cfr west coast Africa

Given the various grades of NPKs imported to this region, estimated freight rates from major exporters and prices of other NPK grades will also be taken into account.

15-15-15 cfr west coast Africa blend

This is a theoretical equivalent cfr price of a blend by calculating the cost of the raw materials required to produce this grade. Freight is added to each of the raw materials prices to determine a cfr price. This price does not include any blending costs or import tax for the raw materials.

Raw materials used for this blend calculation are:

- Urea fob Algeria (see the [Argus Nitrogen methodology](#))
- DAP fob Morocco (see the [Argus Phosphates methodology](#))
- Granular MOP fob Baltic/Black Sea (see the [Argus Potash methodology](#))

15-15-15 (SOP) cfr China

This price refers only to SOP-based 15-15-15.

15-15-15 fca Spain (€/t)

15-15-15 cif inland Germany (€/t)

16-16-16 fob Baltic/Black Sea

16-16-16 Ukraine cpt (bagged) (HRN/t)

This is a domestic price assessed in Ukrainian hryvnia. 16-16-16 is typically sold in railcar lots to end-users as well as on an ex-warehouse basis. The minimum cargo size for this assessment is 100t. Argus assesses this price in big bags as this is the most common bag size in Ukraine, although 50kg bags are sometimes used. The price includes VAT.

10-26-26 Ukraine cpt (bagged) (HRN/t)

This is a domestic price assessed in Ukrainian hryvnia. 10-26-26 is typically sold in railcar lots to end-users as well as on an ex-warehouse basis. The minimum cargo size for this assessment is 100t. Argus assesses this price in big bags as this is the most common bag size in Ukraine. The price includes VAT.

16-16-16 (MOP) cfr China

Along with sales delivered by vessels, sales of product delivered in containers are also considered for inclusion in the assessment if the mode of delivery does not alter the price. Fob prices in export regions and freight rates to China are taken into account in assessing the price.

15-15-15/16-16-16 cfr southeast Asia

Both grades are included in the assessment. Along with sales delivered by vessels, sales of product delivered in containers are also considered for inclusion in the assessment if the mode of delivery does not alter the price.

Fob prices and freight rates to southeast Asia are taken into account in assessing the price.

17-17-17 cfr east coast Africa blend

This is a theoretical equivalent cfr price of a blend by calculating the cost of the raw materials required to produce this grade.

Freight is added to each of the raw materials prices to determine a cfr price. This price does not include any blending costs or import tax for the raw materials.

Raw materials used for this blend calculation are:

- Urea Middle East fob non-US netbacks (see the [Argus Nitrogen methodology](#))
- DAP fob Saudi Arabia (KSA) (see the [Argus Phosphates methodology](#))
- Granular MOP fob Baltic/Black Sea (see the [Argus Potash methodology](#))

10-26-26 fob Baltic

Estimated freight rates and delivered prices may be used to calculate an equivalent fob price.

10-26-26 cfr India duty paid/duty free

Estimated freight rates and fob prices may be used to calculate an equivalent cfr price. The price is of product not subject to import duty or for which import duty has already been paid.

16-20-0 fob China

Estimated freight rates from major importers may also be taken into account to calculate netbacks.

16-20-0+13S cfr Thailand

The range of published prices may be relatively wide because of premiums often paid for product of specific origin.

12-46-0+7S fob Morocco

Netbacks from major importers may also be taken into account.

20-20-0+13S cfr India duty paid/duty free

Market information about fob prices for the same material from supplying countries, and estimated freight rates to India may be included in the assessment. The price is of product not subject to import duty or for which import duty has already been paid.

Related markets

DAP fob Morocco

See the [Argus Phosphates methodology](#)

Granular urea bulk Middle East fob non-US netbacks

See the [Argus Nitrogen methodology](#)

MOP fob Baltic/Black Sea

See the [Argus Potash methodology](#)

Freight assessments

Argus NPKs includes several freight rate assessments. Prices are assessed as a range, and include information collected over the course of the trading week.

Freight rate assessments are established by surveying freight providers and buyers of spot freight, maintaining a balance between both parties. The assessment is for cargoes that will load and move within the next 30 days.

Routes assessed

Algeria-WC Africa 15,000-20,000t
Baltic-ARAG (Amsterdam, Rotterdam, Antwerp, Ghent) 25,000t
Baltic-China 50,000-60,000t
Baltic-Thailand 50,000-60,000t
Baltic-EC Africa 25,000t
Baltic-WC Africa 15,000-20,000t
Baltic-India 50,000-60,000t
Belgium-China 30,000-35,000t
Finland-China 40,000-50,000t
Morocco-ARAG 10,000-15,000t
Morocco-EC Africa 25,000t
Morocco-Mediterranean 6,000t
Morocco-WC Africa 15,000-20,000t
Norway-Brazil 20,000-25,000t
Norway-Thailand 20,000-25,000t
Norway-China 40,000-50,000t
Saudi Arabia-EC Africa 15,000-20,000t

One freight rate assessment is republished from Argus Phosphates.

Baltic-Brazil 25,000-35,000t

See the [Argus Phosphates methodology](#).