METHODOLOGY AND SPECIFICATIONS GUIDE

argus

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ARGUS PHOSPHATES

Contents:

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The most up-to-date Argus Phosphates methodology is available on www.argusmedia.com

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 phosphates 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 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 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.
- 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 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.

Minimum transaction thresholds

Assessment	Minimum trade volume for inclusion in assessment
fob bulk DAP/MAP Tampa	5,000t

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 Phosphates prices are published in the Argus Phosphates 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 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 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.

Publication frequency

Argus publishes the Argus Phosphates report once a week on a Thursday evening in the UK. The report is published 51 weeks of the year. The Argus Phosphates report is not published for one week during the Christmas/New Year holidays in the UK, although the precise dates of non-publication are dependent on when holidays fall within the week. 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.

In assessing fob prices, Argus speaks with the key producers in the exporting regions — the US, Mexico, Russia, Morocco, Tunisia, Jordan, Saudi Arabia, China and Australia — and in assessing cfr prices, Argus speaks with the major importers in the main import markets — Argentina, Brazil, India, Pakistan and Europe. International and regional traders are also consulted and at all stages. Argus attempts to speak to all parties involved in a transaction. Argus also consults with freight brokers to ensure accurate netback calculations.

Assessing price ranges

Phosphate 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) 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 actual 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.

The price guide reflects the last seven days of business Friday through to Thursday — market information will be collected up until 17:00 UK time on the Thursday of publication. However, while all information and trades are taken into account, in periods of high volatility, assessments are weighed towards trading activity later in the week or at the end of the Thursday of the assessment.

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. This is most relevant for Indian DAP, phosphate rock and phosphoric acid contract pricing.

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 utilising published prices from Argus and/or other publications. 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 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.

One exception is the quarterly phosphoric acid price in India, which will usually include 30 days' credit and is quoted as such.

Units

All prices are assessed in US $/t, apart from US domestic references, which are priced in short tons (st). The report includes a price assessment for phosphoric acid that is expressed in $/t P2O5 (merchant grade phosphoric acid is shipped as a 54% P2O5 solution). The phosphate Price Guide includes an assessment for US molten sulphur quarterly contracts cfr Tampa, which is expressed in US long tons.

Lot and cargo sizes

For international trade, the minimum lot size used for consideration and inclusion in the relevant price range is 5,000t of a particular product (this includes 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 US domestic market for which the price is indicative of one barge, assumed to be carrying a minimum of 1,500st, with no set maximum number of barges. There may be occasions when a barge is loaded with less quantity for reasons of low draught levels, but this will be explained fully in the text.

For the phosphates 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 handysize vessels and above:

- Minimum 5,000t (for example Mediterranean vessels from north Africa)
- Handysize 10,000-35,000t (the majority of deepsea phosphate trade)
- Handymax (35,000-59,000t)
- Panamax (60,000-85,000t plus)
- Post-panamax 85,000t and above (OCP began loading such vessels in Jorf Lasfar, Morocco, in early 2015)

In the US domestic phosphates market:

- A typical barge on Nola is 1,500st
- A central Florida railcar is minimum 100st

Products and specifications

Diammonium phosphate (DAP) is a dry, bulk fertilizer containing 18pc nitrogen and 46pc phosphate by weight. It is produced by combining ammonia with phosphoric acid and is widely used in granular form for direct application to land or as a feedstock for bulk blending for NPK manufacture. Prices are only assessed based on deals concluded in the agricultural sector. Sales to the industrial sector may be discussed in the text, but will not form part of the assessment.

Monammonium phosphate (MAP) is a dry bulk fertilizer containing typically 11-12pc nitrogen and 52pc phosphate by weight. It is also formulated by adding phosphoric acid to ammonia solution and can be used for direct application or for use as a raw material in bulk blending. Argus assesses the MAP price for product with minimum 52pc phosphate by weight. Typical grade includes Moroccan 11-52 and Russian 12-52 MAP. Other types of product, particularly 11-44 and 10-50 MAP from China, are mentioned in the text and prices reported.

Triple superphosphate (TSP) 46pc P2O5 (straight fertilizer — i.e. no N or K).

Single superphosphate (SSP) 21pc P2O5 (low analysis straight fertilizer) — is a low analysis fertilizer and international trade is thin as most product is manufactured and consumed locally, particularly in Brazil and India. Prices are quoted in specific country text sections as a guide, but Argus does not quote such prices in its price guide.

Phosphoric acid 100pc P2O5 (as merchant grade 54pc P2O5 solution) usually quoted in terms of tonne P2O5, i.e. 100pc P2O5 content, although it is actually shipped in a 54pc concentration, called merchant grade acid or phosphoric acid solution, for ease of handling and storage. Phosphoric acid is a liquid, is highly corrosive and dangerous and has to be shipped in stainless steel tankers.

Phosphate rock — phosphate fertilizers are made from phosphate rock (calcium phosphate). This is mined as an ore either by opencast (strip) or underground mining. Phosphate rock is present in many countries, but is only present in commercially viable quantities in a few (Morocco has 80pc of global reserves). The phosphate content or grade of phosphate rock is expressed as phosphorus pentoxide (P2O5). In the phosphate industry and consequently Argus reports, the phosphate content of the rock is usually expressed as tricalcium phosphate and traditionally referred to as bone phosphate of lime (BPL) (P2O5 $\times$ 2.1853 = BPL). Manufacturers of phosphoric acid and phosphate fertilizers normally stipulate a minimum content of 28pc P2O5, and most marketed grades of phosphate rock contain more than 30pc P2O5 (65pc BPL). The concentration of P2O5 in the rock determines its quality. The higher the P2O5 content, the higher the rock quality. Phosphate rock is washed and treated to remove impurities at the mine. It is then processed through reaction with sulphuric acid to make phosphoric acid. Phosphoric acid is the main intermediate product used to make DAP, MAP, TSP and some compound fertilizers. The production of 1t of phosphoric acid requires approximately 3.5t of phosphate rock.

Markets covered

Spot prices

DAP/MAP/TSP — fob bulk

DAP/MAP Tampa

The DAP/MAP Tampa price is predominantly assessed on the basis of sales to Central and Latin America by US producer Mosaic, which forms the high end of the range. Spot sales to India normally during the second and third quarters of the year sometime form the low end of the assessed price range. Trader activity selling domestic material is extremely rare. During periods of illiquidity, Argus may calculate a netback fob price on the basis of achievable cfr prices in Latin America. Normally, the price is rolled over if no new business or offers are reported.

Netbacks from shipments of US product to Mosaic's distributions systems offshore — particularly in Brazil and India — are not included in the range, nor are netbacks from contract DAP shipments to Japan, Australia and Canada.

DAP/MAP Tampa fob equivalent netback Brazil

The Argus DAP cfr Brazil price assessment less the Argus Tampa-Brazil (25,000-35,000t) freight rate assessment giving an equivalent netback for US product moving to Brazil under contract.

See the Argus Fertilizer Brazil methodology for more information on the DAP cfr Brazil price assessment.

DAP fob Tampa equivalent netback India

The Mosaic maximum retail price (MRP) in Indian rupees applicable to its distribution system within India, accounting for local duties, bagging and port costs to arrive at an Indian cfr price, converted to US dollars using current exchange rates, less the Argus Tampa-west coast India (55,000-60,000t) freight rate assessment.

The result is a theoretical netback to Tampa from Mosaic's distribution business within India, which typically amounts to around 500,000 t/yr of exports.

DAP Tunisia

The price range is almost entirely defined on the basis of sales to the European and Turkish markets by Groupe Chimique Tunisien (GCT).

Because production is restricted premium markets in the Mediterranean region are preferred over deepsea markets such as Latin America and southeast Asia.

During periods of illiquidity, the range may be defined on the basis of Moroccan DAP pricing, as both serve similar markets and prices tend to be strongly correlated. Allowance is made for freight differentials. Contract shipments to Bangladesh are not included.

DAP Morocco

This price range is defined by sales made by Office Cherifiens des Phosphates (OCP). OCP exports globally but European sales usually set the high end of the range, and deepsea exports, mainly to Latin America, usually set the low end of the range. Sales to the US market are included as some sales are made on a spot basis.

Morocco DAP fob equivalent netback US terminals

The Argus DAP Twin Cities fot price assessment less the Argus Mississippi river-St Paul spot barge freight rate assessment, throughput costs regularly reviewed by Argus including loading and unloading from barges at New Orleans and at the terminal, and an estimated freight from Jorf Lasfar to New Orleans.

See the Argus North American Fertilizer methodology for more information on the DAP Twin Cities fot price and barge freight rate assessments. The price is a theoretical netback to OCP Morocco as part of its increasing formula/contract shipments to the US through a number of US traders and distributors.

Note: US price and barge freight assessments are converted from short to metric tonnes as part of the netback calculation

DAP Lithuania Baltic

DAP exported through the Baltic Sea out of the port of Klaipeda. European sales usually form the high end of the range with Latin

American or Indian sales forming the lower end. The exporting company is EuroChem, from the Lifosa facility. Lithuanian DAP is duty free into the EU. The netback from European sales is almost always higher than for Russian DAP shipments into the EU.

DAP Russia Baltic/Black Sea
The DAP price allows for the 6.5pc duty applicable to Russian DAP delivered to the EU. European sales usually form the high end of the range with Latin American or Indian sales forming the lower end. The main exporting company is PhosAgro although EuroChem also exports DAP from its Kingisepp facility.

DAP China
The Chinese DAP price is mostly defined by cfr prices available in south Asian markets, predominantly India, Pakistan and Bangladesh, although southeast Asia also takes sizeable volumes. Many sales are now direct, rather than through traders. Vietnam imposes an anti-dumping duty on Chinese DAP to protect the local industry, greatly reducing exports.

The main exporters are YUC, Kailin, Xiangfeng, Wengfu and Yihua.

DAP Saudi Arabia (KSA)
Ma'aden Phosphate Company (MPC) is the producer in Saudi Arabia and product is marketed primarily through Ma'aden and to a lesser extent by Sabic. The price is primarily defined on sales to west coast India. For geographical reasons, Saudi DAP is also exported to east coast Africa and netbacks from this trade are included when verified by counterparties. Typically DAP from Saudi Arabia trades at a small premium to Chinese material on the Indian subcontinent. Traders also take Saudi DAP to Latin America and these netbacks are included.

DAP Mexico
Mexican DAP is supplied from Pemex on the west coast and has a natural freight advantage to west coast Central and Latin American markets, especially Chile. Accordingly, Mexican DAP typically trades at a fob premium to US DAP coming out of the Gulf of Mexico and avoiding the Panama Canal in these markets. The price tracks US DAP/MAP Tampa prices closely.

DAP/MAP Australia
DAP is exported by Incitec Pivot, which ships out of Townsville on the northeast coast of Australia. Trading firm Quantum handles all exports as agent. Australian DAP/MAP is exported all year round, although liquidity is higher in the middle of the year, coinciding with the off-season in the Australian domestic market. The main export destinations are Bangladesh, Pakistan and India.

DAP US Gulf domestic barge
See DAP Nola barge fob in the Argus North American Fertilizer methodology.

DAP Central Florida railcar
See DAP Central Florida rail in the Argus North American Fertilizer methodology.

DAP China ex-works
This price is assessed using the yuan/$ exchange rate at the time of assessment, usually on Thursday afternoon.

DAP Benelux fot/fob duty paid/duty free
This is the price in the Benelux/Terneuzen region on an fot basis. As there is limited DAP production in northwest Europe, significant DAP imports are taken from Russia, Lithuania (both through the Baltic) and Morocco. There is a 6.5pc duty on Russian DAP into the EU but the other sources enjoy duty-free status. Imports are taken in and then sold on an fca/ex-warehouse basis.

DAP Turkey duty paid/duty free
This is the price paid by Turkish importers for DAP on a duty free/duty paid basis. A duty of 6.5pc is paid on DAP from Russia, Saudi Arabia, the US, China and Australia. However there is no duty on imports from Morocco, Tunisia and Jordan (from which the majority of DAP is sourced). North African producers agree volume contracts which are priced on a cargo by cargo basis. There are additionally spot trader sales particularly of Jordanian material. Turkey is most active during the third quarter but imports throughout the year both for direct application and use in NPK manufacture. The price is influenced by the relative price of NPKs in the domestic sector. Low NPK prices tend to encourage a switch away from DAP and hence lower prices.

MAP Baltic
Sales to the European market usually define the high end of the range, with deepsea sales, often to Latin America, usually defining the low end. MAP exports to the EU from Russia are subject to a 6.5pc duty, which is taken into account in the assessment. In contrast, because EuroChem does not normally produce MAP at the Lifosa facility in Lithuania, there are no duty-free exports to the EU.

MAP China 11-44 fob
The MAP price is defined almost exclusively by trader sales of Chinese 11-44 to the Brazilian market. In the absence of liquidity, the price can be defined on the basis of 11-52 MAP cfr prices in Brazil, allowing for nutrient differentials and a discount of $10-20/t to 11-52. There is often a difference between fob China asking prices and trader's cfr sales prices into Brazil depending on the position of the seller. Accordingly, fob China offers are given most weight in the assessment. Globally active traders and Chinese producers are consulted to form the range.

MAP China 10-50 fob
As with 11-44, the 10-50 price is defined almost exclusively on sales to Brazil although some sales to the US domestic system also take place and netbacks from this market are also taken into account. The assessment rationale is the same as for 11-44.

MAP China 11-52 fob
11-52 is traded in the same way as Chinese 10-50 and 11-44. The main outlet is Brazil and the assessment rationale is the same as for 11-44 and 10-50.

MAP 10-50 (ex-China) cfr Brazil
See the Argus Fertilizer Brazil methodology.

MAP 11-44 (ex-China) cfr Brazil
See the Argus Fertilizer Brazil methodology.

MAP Morocco
Most Moroccan MAP is shipped to Brazil and prices are typically on a par with Moroccan DAP prices. Sales to European markets normally define the high end of the range.

TSP Tunisia
GCT sells much of its TSP to Bangladesh under government-to-government contracts priced under formula, limiting price transparency. Prices are defined mainly by sales to European markets or by sales to the private sector in Bangladesh under tender. The price typically tracks the Moroccan TSP price closely.

TSP Morocco
The TSP Morocco price assessment is defined by sales made by OCP to Europe at the high end of the range and to Latin America at the low end. OCP is also a major supplier to the Bangladeshi public and private sectors and these sales are included where possible.

TSP China
The Chinese TSP price is assessed mainly on sales to southeast Asia, particularly Indonesia, as well as sales to Brazil and Latin America. Iran is also an occasional outlet although this price is not included in the assessment. Due to quality issues, Chinese TSP no longer features in Bangladesh, which is one of the largest TSP markets globally.

TSP eastern Med (Lebanon/Israel)
The price predominantly refers to Lebanese TSP produced by LCC Lebanon, which primarily goes to European markets as well as Latin America and Bangladesh. Israel exports to Europe, the US and Brazil.

DAP/MAP cfr bulk Argentina/Uruguay
Argentina and Uruguay usually pay the same price for DAP and MAP and shipments are often combined. The market usually trades at a premium to the Brazilian cfr price owing to freight and logistic costs. The price assessment is predominantly defined on the basis of trader sales, although some producers such as OCP occasionally sell directly.

MAP Brazil
Brazil is the most competitive MAP market as no one producer has a distinct freight advantage. Brazil imports MAP throughout the year from a variety of origins, both through direct producer sales and through traders. The market is liquid and often the range is assessed on the basis of transactions, although bids and offers are also included when liquidity or confirmation of trades is lacking.

DAP India
The cfr price in India is ultimately capped by importer economics relative to the current subsidy in place, the value of the Indian rupee and the maximum retail price in force. The price assessment is usually defined on the basis of sales by Chinese producers at the lower end and Saudi product at the higher end, which trades at a slight premium.

DAP Pakistan
Pakistan usually trades at a slight premium to India owing to freight economics. Moroccan, Chinese and Australian DAP dominates the market with Saudi DAP discouraged due to colour issues. Australian DAP usually commands a slight premium over other sources.

Raw material contracts

Phosphoric acid/t P2O5

Cfr India
The price is usually settled on a quarterly basis with OCP leading negotiations. The price is settled in $/t P2O5 cfr with 30 days credit. On occasion, the price is settled for six months. This is explained in the text and the quarterly price is moved at the appropriate time. Contract negotiations can be protracted and the price does not always settle promptly.

Cfr western Europe
Imports are primarily from OCP Morocco for producers in Belgium, France and the Netherlands. Prices are agreed on a quarterly basis. The price change from quarter to quarter usually tracks the Indian price.

Cfr Brazil
OCP Morocco provides most of the phosphoric acid to Brazil and the price usually moves in tandem with those for India and western Europe.

Phosphate rock (% BPL)

Fob Jordan (68-70)
JPMC is a major phosphate rock producer, and much of its exports go to India.

Cfr India (68-70), cfr India (70-72)
India is the major phosphate rock buyer globally. It buys from Egypt, Israel, Morocco and Togo as well as Jordan, the largest supplier.

Fob north Africa (69pc)
Defined by sales to Europe, India and Brazil from OCP/GCT.

Relative nutrient values
The price of various products in their pure P2O5 nutrient form, with the value of nitrogen extracted. As DAP (18pc) and MAP (11pc) contain nitrogen elements, these have been extracted to calculate a pure phosphate nutrient value.

Fob DAP Morocco $/t P2O5, $/unit
The value of Moroccan DAP in P2O5 terms per tonne and per unit, useful in comparing Moroccan DAP prices and netbacks to the price of phosphoric acid contracts in India, a relationship that shapes quarterly phosphoric contract negotiations.

Calculated as:
$/t P2O5 = (DAP Morocco – (18/46*North Africa Urea))*100/46

A $/unit value figure is also provided, calculated as the $/t P2O5 value divided by 100.

Fob DAP China $/t P2O5, $/unit

The value of Chinese DAP fob in P2O5 terms per tonne and per unit, useful in comparing Chinese DAP export values to other phosphate exports and to netbacks from the domestic sector.

Calculated as:
$/t P2O5 = (DAP China fob – (18/46*China prilled urea fob))*100/46

A $/unit value figure is also provided, calculated as the $/t P2O5 value divided by 100.

Cfr MAP 11-52 Brazil $/t P2O5, $/unit

The value of 11-52 MAP sourced from China for export to Brazil, useful in comparing the relative P2O5 values of 11-52, 10-52 and 11-44. Typically there is a discount in the price of 11-44 and 10-50 to 11-52 when relative nutrient values are taken into account. In recent years, this discount has narrowed, reflecting Chinese producer export strategies and the pull on MAP from the Chinese domestic sector.

Calculated as:
$/t P2O5 = (Brazilian MAP 11-52 cfr range) – (11/46*Brazilian granular urea cfr))*100/52

A $/unit value figure is also provided, calculated as the $/t P2O5 value divided by 100.

Cfr MAP 11-44 Brazil $/t P2O5, $/unit

Calculated as:
$/t P2O5 = (Brazilian MAP 11-44 cfr range) – (11/46*Brazilian granular urea cfr))*100/44

A $/unit value figure is also provided, calculated as the $/t P2O5 value divided by 100.

Cfr MAP 10-50 Brazil $/t P2O5 and $/unit

Calculated as: $/t P2O5 = (Brazilian MAP 10-50 cfr range) – (10/46*Brazilian granular urea cfr))*100/50

A $/unit value figure is also provided, calculated as the $/t P2O5 value divided by 100.

Freight

Argus Phosphates 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 30-40 days.

Finished phosphates

- Tampa-west coast India (55,000-60,000t)
- Morocco-Brazil (25,000-35,000t)
- Tampa-Brazil (25,000-35,000t)
- Baltic-Brazil (25,000-35,000t)
- Baltic-India (25,000-35,000t)
- Kingdom of Saudi Arabia (KSA)-east coast India

Phosphate Rock

- Morocco-South Brazil (30,000t)
- Red Sea-west coast/east coast India (25,000-35,000t)
- Red Sea-Indonesia (25,000-35,000t)
- Morocco-US (25,000-35,000t)