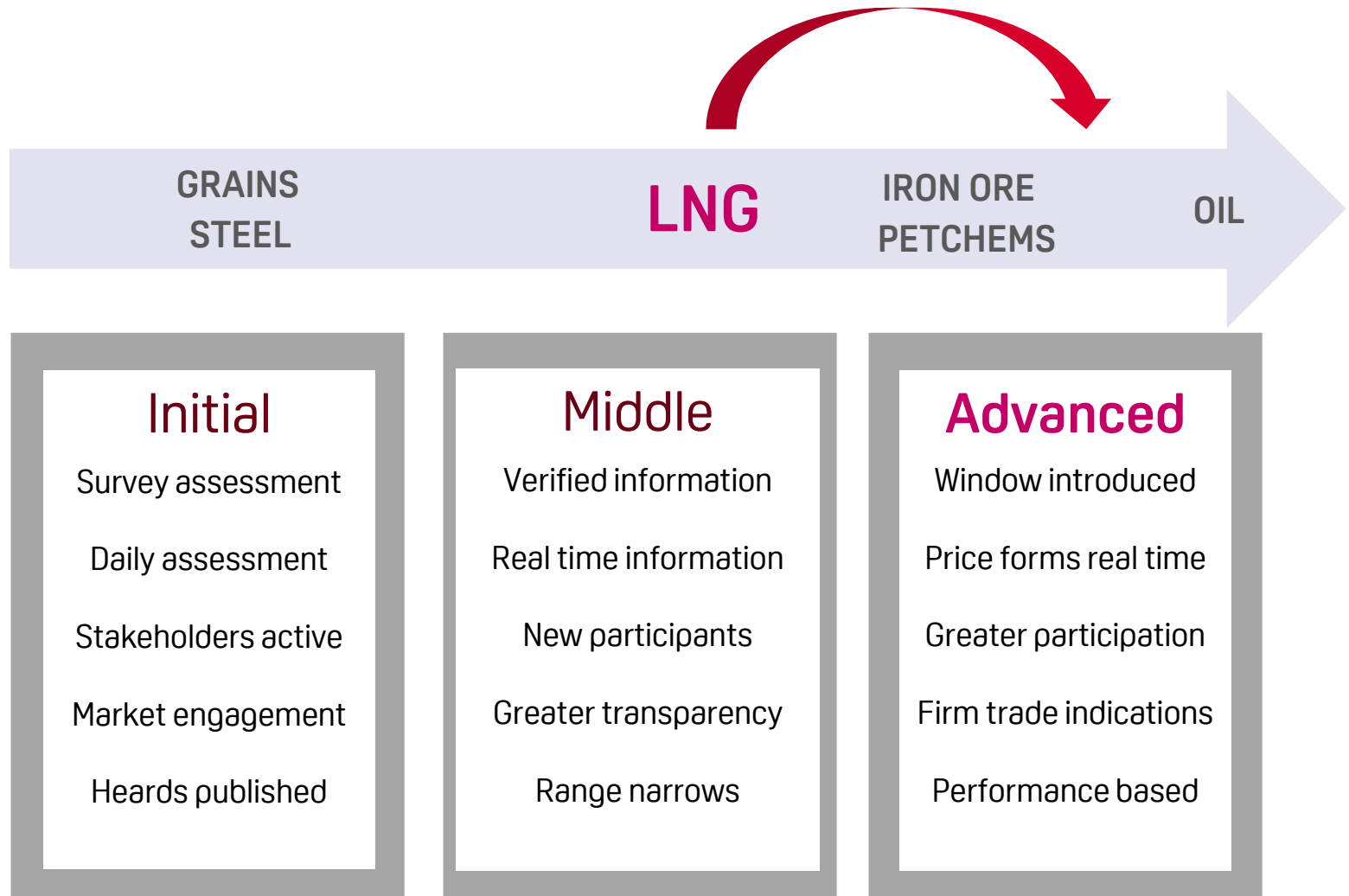


Introduction to LNG Methodology

Houston
10 October, 2018



Is JKM LNG evolving towards an Advanced market?



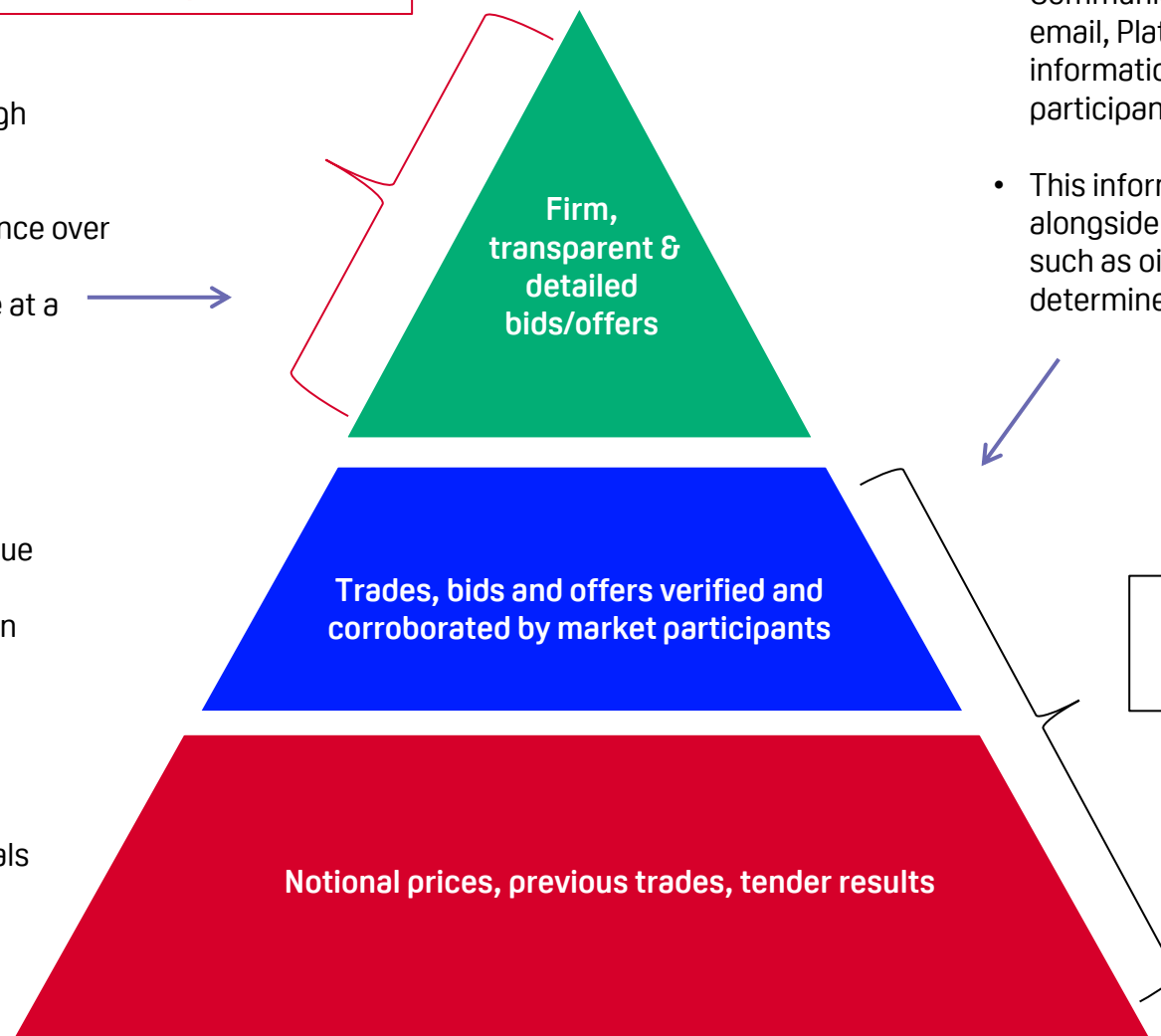
Hierarchy of assessment data quality

**Firm MOC @ 4.00pm
to 4.30pm**

- Published live through Platts' systems
- These take precedence over other non-window information as value at a given time can be determined.



- Notional prices only give an indicative value
- Can be disregarded in the case of differing influencing factors such as oil and gas price movements or other supply and demand fundamentals



- Communicated via IM, phone or email, Platts seeks to verify this information with market participants throughout the day
- This information can be used alongside other influencing factors, such as oil and gas prices, to determine the assessment.

**Intra-day values
@ 3pm**

Platts Market on Close (MOC) Explained

A **structured system** designed to yield a **price assessment reflective of market values** at the **close of the typical trading day**

Similar **information gathering systems** are common in the **futures markets** where **commodity exchanges** publish **daily settlement prices reflective of activity at the close of markets**

The Market on Close allows transparent and fully verifiable market information to form the basis of the daily price assessment

Companies who have gone through MOC Participation Review



RWE

bp



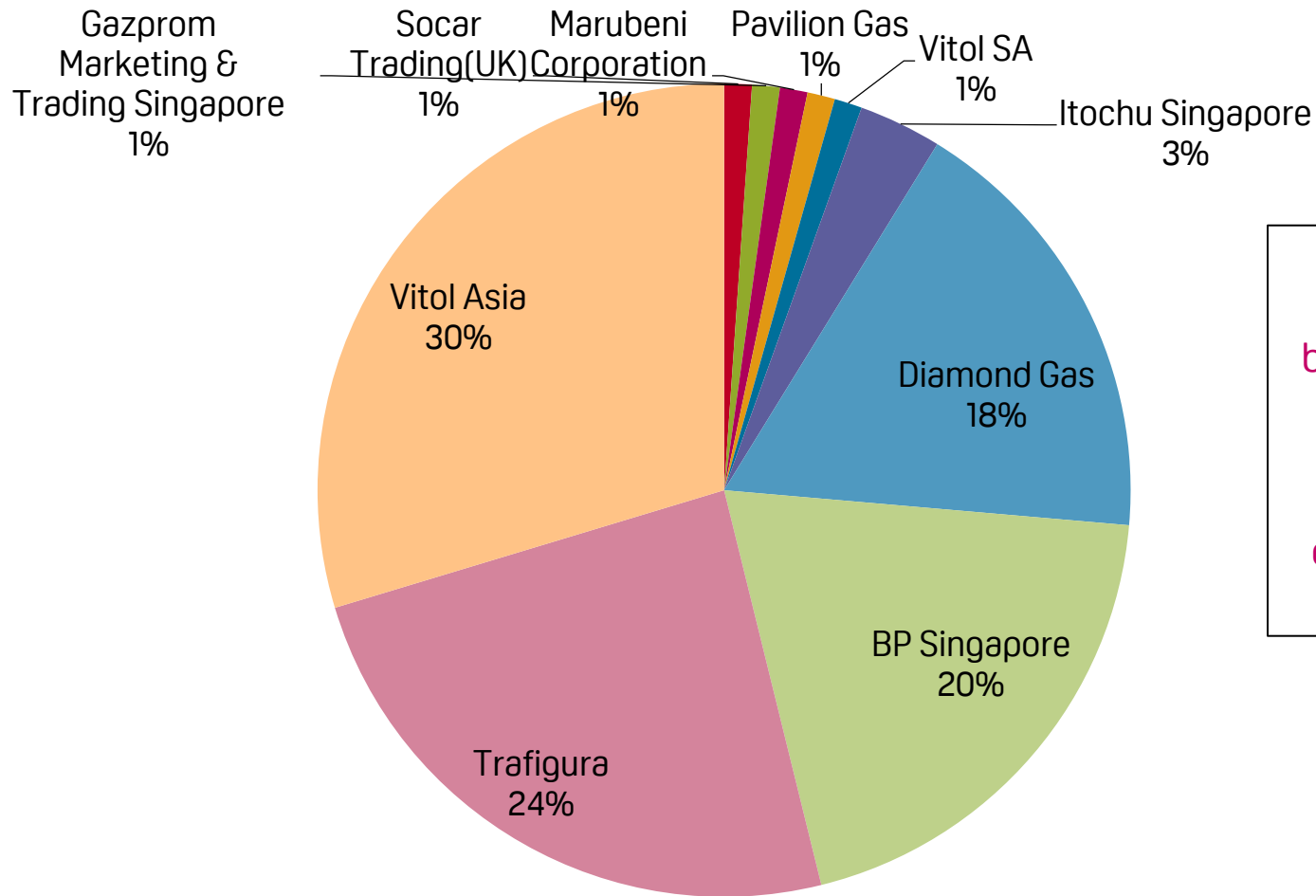
Marubeni



GLENCORE

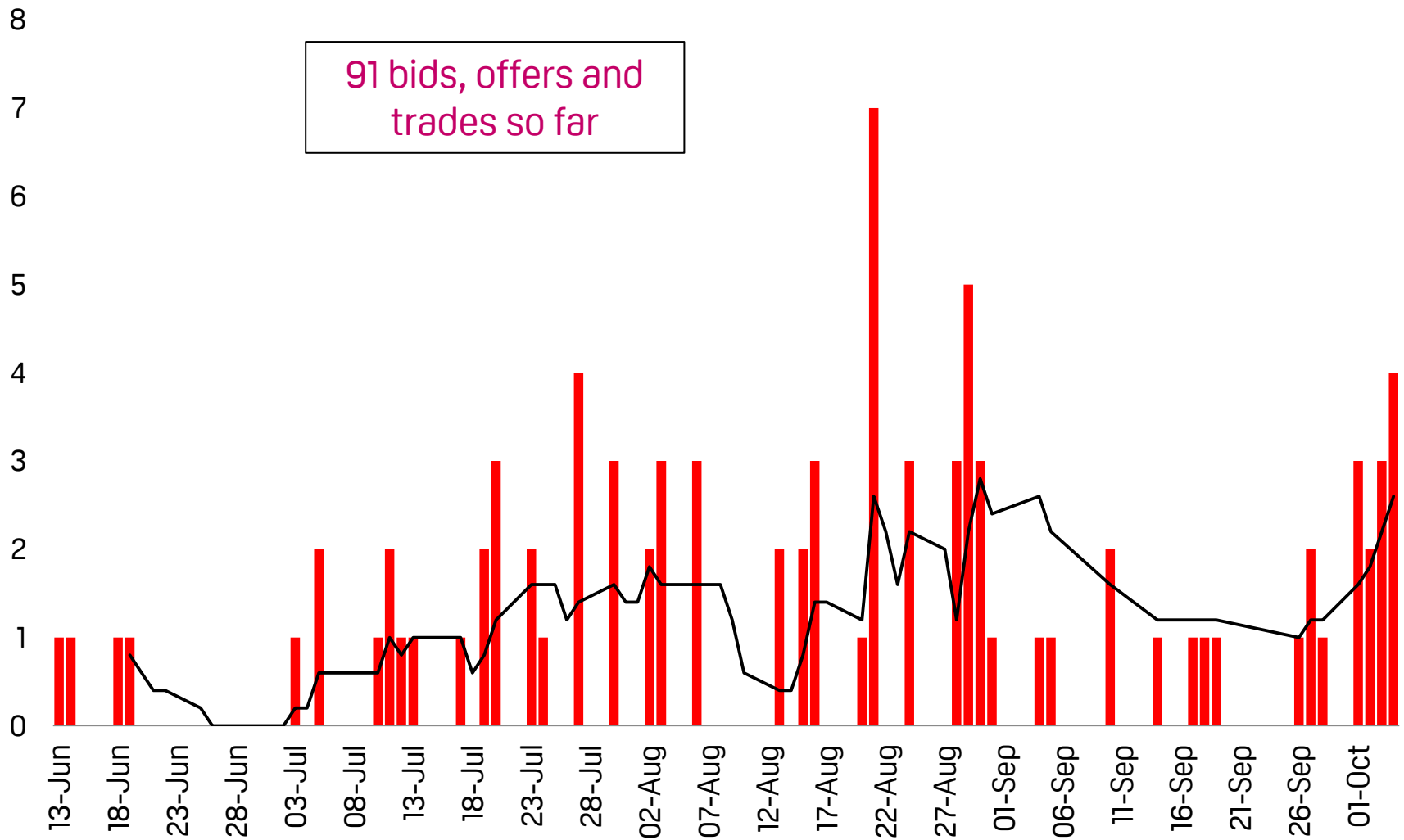


Participation from a range of companies (June 13 to October 4, 2018)

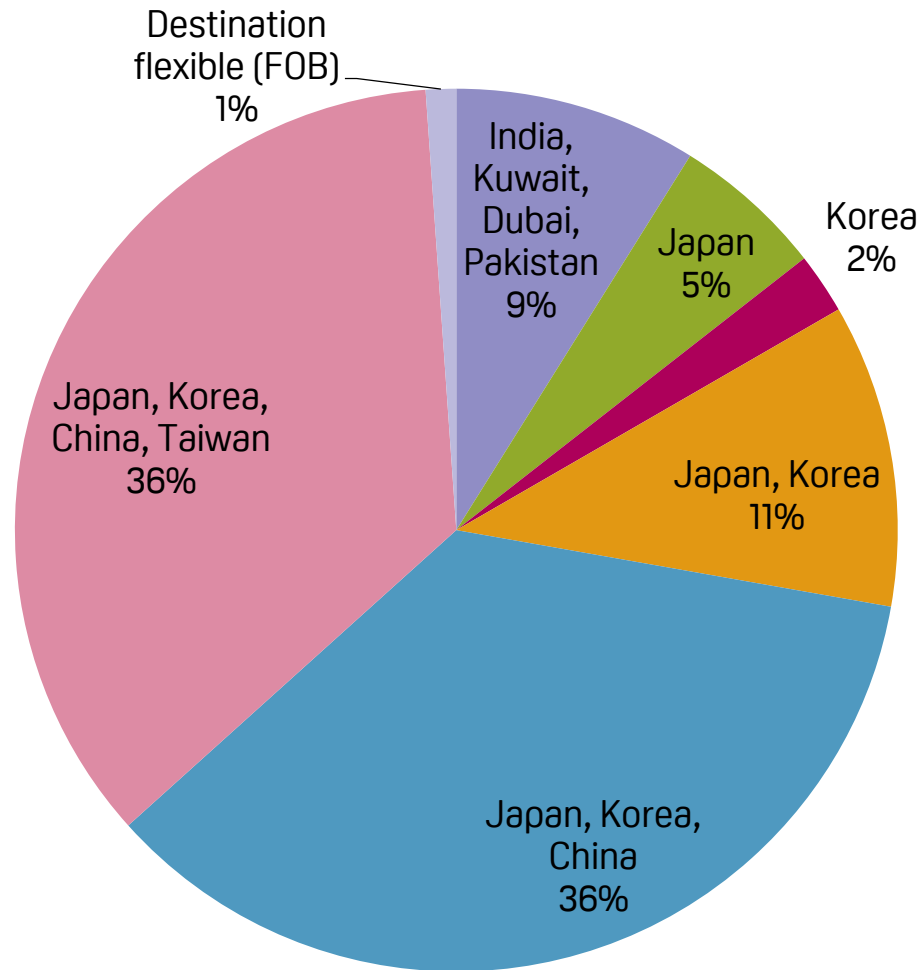


Total of 18 companies have been approved for participation. 9 companies have submitted bids, offers and trades for publication

Growth of LNG MOC information (June 13 to October 4, 2018)



Information standardizing around location (June 13 to October 4, 2018)



Firm MOC guidelines for JKM LNG assessments

- Platts will publish bids, offers and interest to trade from approved and named participants in the JKM MOC process
- Buyers and sellers can submit bids and offers to Platts any-time before 16:00 Singapore time
- **Companies who wish to submit an MOC order need to be approved via the counterparty review process**
- **Any company in the market set up for bilateral trade with these companies can lift or trade these bids and offers by communicating interest to Platts**
- Counterparties can improve the price of their published bids and offers by up to 5 cents/MMBtu every 2 minutes. No price changes are allowed in the final minute of the MOC that concludes at 16:30 Singapore time
- Besides information published in the MOC window, Platts pricing specialists also engage directly with producers, consumers, traders, brokers and shippers to gather price information

Required information in a firm MOC order

- Required information in a published bid or offer: Terms of Delivery (FOB or DES), loading (FOB)/discharge (DES) location, laycan, quantity, price, quality, ship criteria and nomination procedures.
- Participants must also clearly state any optionality related to the bid/offer parameters such as volume, location or quality at the time of submission, though Platts will review these for reasonability prior to publication.

Example Format

Company A bids/offers at \$XX.XX/MMBtu, [Loading or delivery dates] XX-XX (XX's option to nominate a XX-day delivery window XX days prior to the initial Delivery Window), [DES or FOB] port XX, Alternate discharge port: XX (XX's option to declare alternative port XX days prior to the Delivery Window subject to SSC), GHV XX-XX Btu/Scf in XX's option, X.X TBtu +/-XX% in XX's option, Ship capacity XX-XX m3 (XX's option to nominate LNG ship)

Intra-day values at 15:00 Singapore time

- June 12: Platts started publishing intraday values for JKM LNG time stamped at 15:00 Singapore time. The intradays reflect Platts assessment of JKM LNG value at the time of publication.
- Platts publish bids and offers in the MOC process that start at a reasonable level relative to the published intraday values.
- MOC Bids: To start at, or lower than intraday values. MOC Offers: To start at, or higher than intra-day values

August 2, 2018:

Platts LNG MOC: Intraday values: DES Japan/Korea; China/Taiwan: H1 September \$9.900/MMBtu
Platts LNG MOC: Intraday values: DES Japan/Korea; China/Taiwan: H2 September \$10.050/MMBtu
Platts LNG MOC: Intraday values: DES Japan/Korea; China/Taiwan: H1 October \$10.400/MMBtu
Platts LNG MOC: Intraday values: DES Japan/Korea; China/Taiwan: H2 October \$10.800/MMBtu

Platts LNG Derivative MOC: Intraday values: October: \$10.700/MMBtu
Platts LNG Derivative MOC: Intraday values: November: \$11.200/MMBtu
Platts LNG Derivative MOC: Intraday values: December: \$11.700/MMBtu
Platts LNG Derivative MOC: Intraday values: Quarter 4: \$11.200/MMBtu
Platts LNG Derivative MOC: Intraday values: Quarter 1: \$11.650/MMBtu
Platts LNG Derivative MOC: Intraday values: Calendar 19: \$9.325/MMBtu

Firm MOC Deals & Post Trade Performance

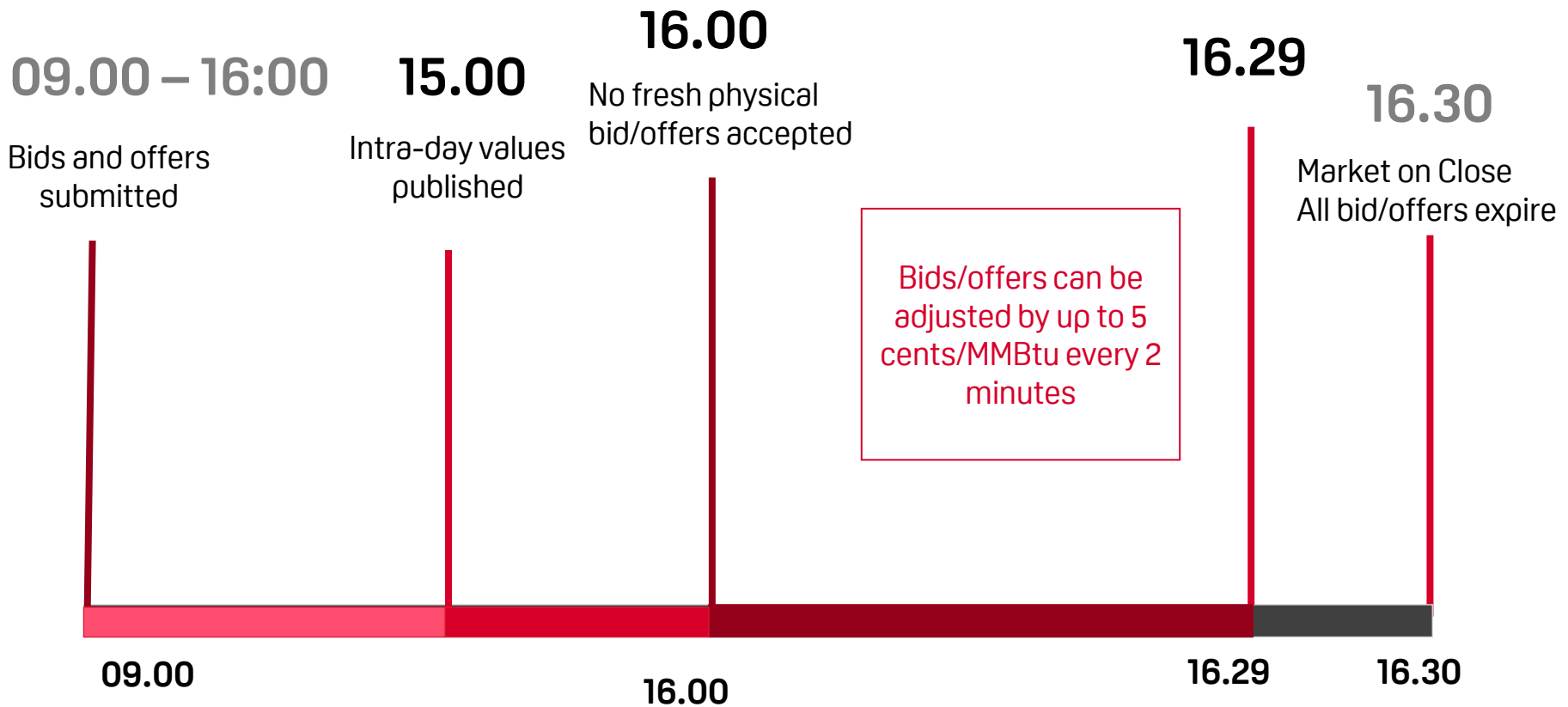
- Companies set up for bilateral trade with entities submitting existing bids and offers can lift or trade them by communicating interest to Platts by 16:30 Singapore time
- Subsequent to Platts publishing an expression of interest to trade, companies must communicate directly with each other to consummate the trade and confirm the same to Platts
- GT&Cs: Counterparties are expected to perform on trades reported in the MOC based on typical GT&Cs and credit terms that have been applied and accepted by both counterparties in the open market
- GT&Cs: If an offer is lifted by a buyer during the Platts MOC process, Platts would expect typical GT&Cs and credit terms between both parties to be applicable, even where the GT&Cs and credit terms stated in the originally published offer may differ, if the companies have not conventionally performed on the published terms
- Platts may review performance of trades reporting in the MOC to maintain the integrity of the assessment process

When MOC orders are submitted & published

LNG MOC timeline

Bids: To start at, or lower than
intra-days
Offers: To start at, or higher than
intra-days

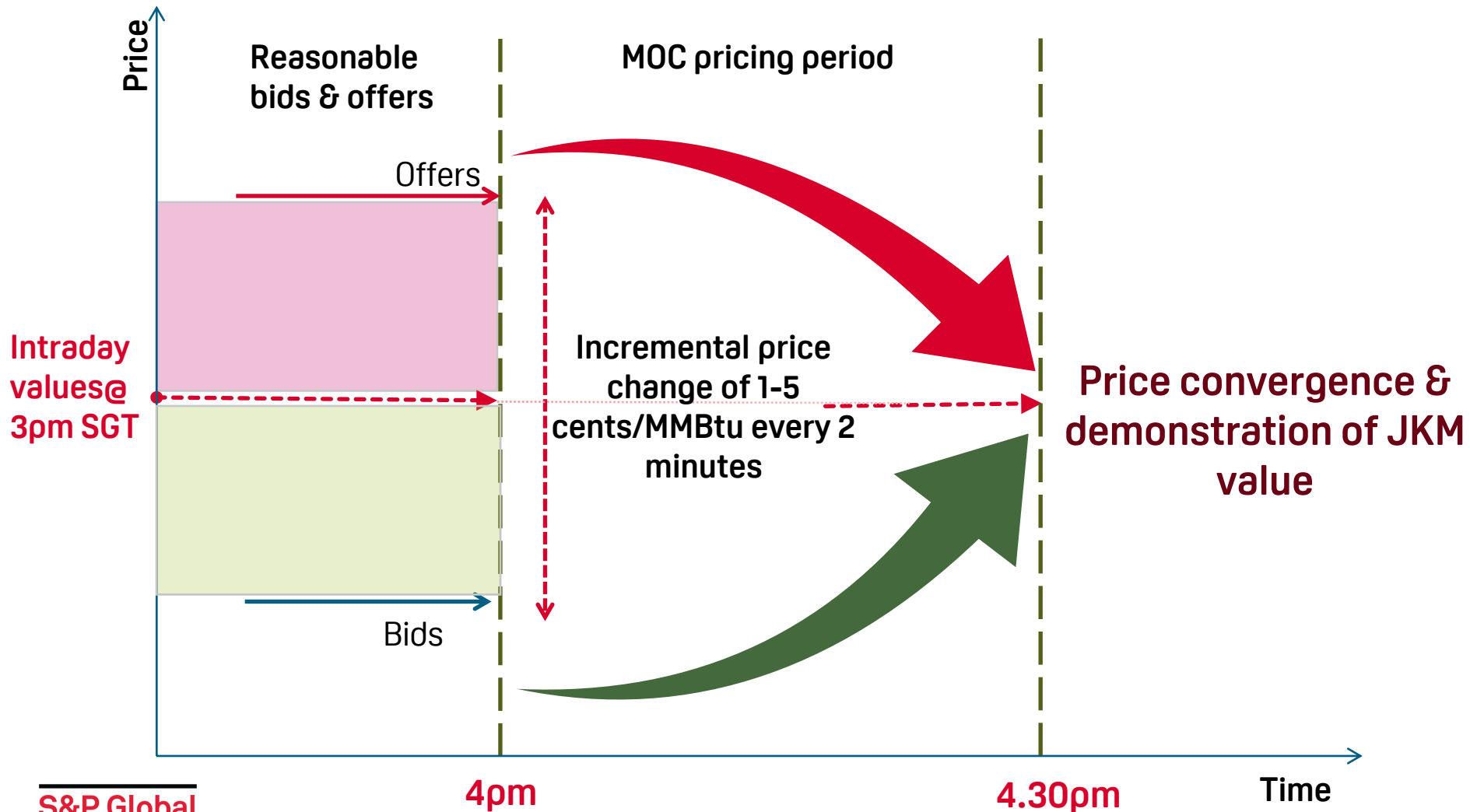
No price changes allowed in
final minute of the MOC



How MOC orders are submitted & published



Bids, offers & trades for physical cargoes and swaps converge and demonstrate JKM value



LNG MOC website: <https://lng-moc.plattslabs.io/heardrs>

Platts LNG MOC

Report to Platts: ✓ Confirmed trades ✓ Firm bids ✓ Firm offers ✓ Indicative values
✓ Transactional activity heard across the market

Singapore: +65 6530 6417, ICE: Platts_asia_lng

London: +44 (0)207176 3506, ICE: Platts_Europe_LNG_Financial

Houston: +1 713 655 2289, ICE: Platts_US_LNG

Email: platts_lng_moc@spglobal.com

Please note that this microsite will auto-populate new hears when available.

August 1st 2018, 04:30 pm (SGT) Platts LNG MOC: BP Singapore PTE LTD BIDS \$10.53/MMBtu, DES, October 13-15 (Buyers option to nominate a 2-day delivery window 35 days prior to the initial Delivery Window), Base Discharge Port Japan, Korea and China to be nominated in the CN, Alternate Discharge Port: Japan, Korea and China (Buyers option to declare alternative port 30 days prior to the Delivery Window subject to SSC), GHV 1030-1130 Btu/SCF in Sellers option, 3,400,000 3,600,000 MMBtu +/-5% in Sellers option to be nominated 35 days prior to the Delivery Window, Ship capacity 140,000-170,000m3 (base ship to be nominated in the CN. Sellers option to nominate alternative LNG ship 35 days prior to the Delivery Window, subejct to SSCS).

LNG MOC so far: c.90 bids, offers & trades from 7 different counterparties since June 2018

Spot deal on July 5, 2018

Platts LNGMOC: Vitol Asia SELLS TO Trafigura Pte Ltd \$10.40/MMBtu, September 10-14 (Buyer's option to nominate a 1-day delivery window 30 days prior to the initial Delivery Window), DES Base Port Tianjin, China, Alternate Discharge Port: Japan/S. Korea/Taiwan/China (Buyer's option to declare alternative port 35 days prior to the Delivery Window subject to SSC), GHV 1040-1150 Btu/SCF in Seller's option, 3,300,000 MMBtu +/-5% in Seller's option, Ship capacity 140,000-180,000m3 (Seller's option to nominate LNG ship) (08:29:49 GMT)

Spot deal on August 31, 2018

Platts LNG MOC: Gazprom Marketing & Trading Singapore Pte. Ltd SELLS TO Vitol Asia Pte Ltd at \$11.80/MMBtu, October 14-18, 2018, to be narrowed by Buyer to 2-day delivery window 30 days prior, DES Base Port in Tokyo Bay, Japan, Alternate Discharge Port: Japan, Taiwan, Korea, China (To be nominated by Buyer 25 days before), GHV 1050-1120 Btu/SCF at Sellers option, 3,300,000 MMBtu +/-5% in Sellers option to be nominated 30 days prior to the Delivery Window, Ship capacity 140,000-177,000m3 (Sellers option to nominate LNG ship 35 days prior to the Delivery Window subject to SSC. Base Ship nominated on trade confirmation) (08:29:21 GMT)

Platts proposes updated guidelines for LNG MOC process (1)

Implementation Sep 17, 2018

- **DELIVERY WINDOW:** The delivery period reflected by bids and offers should typically be three to five days long, with the buyer's option to narrow to a one-or two-day delivery window 30 days before the first day of the traded laycan.
- **DISCHARGE LOCATION:** Bids and offers should typically reflect delivery into Japan, South Korea, Taiwan and China, with buyer's option to nominate discharge country and port. Platts may normalize for fewer or additional countries of destination. For transactions concluded and reported through the MOC process, buyers should nominate final delivery country 35 days, and delivery port 30 days, before the first day of the traded laycan. Buyers would retain the option to substitute delivery port within the same country up to 20 days before the first day of the traded laycan, subject to ship shore compatibility study.
- **LOADING LOCATION:** Platts proposes to reflect seller's option to nominate the loading port 30 days prior to the first day of the traded laycan. Seller may substitute loading port up to 25 days prior to the first day of the traded laycan subject to Gross Heating Value (GHV) quality range reported in the trade.

Platts proposes updated guidelines for LNG MOC process (2)

Implementation Sep 17, 2018

- **QUALITY:** Market participants should clearly state expectations for GHV specifications in bids and offers submitted for publication. Platts JKM assessments reflect cargoes with a GHV of 1030-1130 Btu/Scf. Platts may normalize for quality specifications with different ranges.
- **QUANTITY:** Market participants should state a specific volume in the range 3.20 TBtu to 3.6 TBtu in bids and offers. This volume should be subject to +/-5% operational tolerance, at the seller's option. Specific volumes outside that range, or any range in volume at time of submission, may be subject to normalization for assessment.
- **LNG VESSEL:** Platts standards would continue to reflect published JKM LNG vessel size range of 135,000-175,000m³. Sellers should nominate an LNG ship latest by 30 days prior to the first day of the traded laycan when performing against transactions concluded and reported in the MOC process. A seller may substitute delivery vessel latest by 25 days prior to the first day of the trade laycan subject to ship shore compatibility study. Platts expects parties to be reasonable when exceptional circumstances require sellers to substitute vessels or buyers to substitute terminals beyond typical standards stated in Platts MOC guidelines. Companies must promptly communicate to their counterparties when such a substitution is required. And buyers or sellers should not unreasonably withhold substitutions or hamper the established delivery process.

MOC Participation Review Process

Objectives and Principles

There are four criteria applied to all MOC applicants and participants without exception:

Ability to Trade

- Must be able to trade on typical terms with a **critical mass*** of active MOC Participants

Trade Performance

- Must demonstrate performance as a buyer and/or seller in the relevant MOC market

Business Profile/Financial Standing

- Must possess sufficient financial standing and credit worthiness

Platts' Methodology/MOC Process

- Must be familiar with Platts' methodology and comply with guidelines

* The critical mass requires a sufficient number of active MOC participants to ensure that bids and offers published by Platts will be representative of typical market value.

Platts JKM MOC Standard Terms

SPECIFICATION	STANDARD TERMS
Delivery Window	3-5 days days long; buyer to narrow to a 1-or 2-day window 30 days prior
Discharge Location	Delivery into Japan, South Korea, Taiwan and China, in buyer's option to nominate delivery port at least 30 days prior, or at time of trade confirmation. Buyer's option to substitute delivery port within the same country up to 20 days prior, subject to SSC
Loading Location	Seller's option to nominate and substitute loading port up to 30 days prior, subject to GHV
Quality	JKM reflects cargoes with GHV of 1030-1130 Btu/Scf
Quantity	Specific volume in range 3.2 TBtu to 3.6 Tbtu; +/-5% operational tolerance, at seller's option
LNG Vessel	JKM LNG vessel size range of 135,000-175,000m3; Sellers to nominate ship either 45 days prior, or at time of trade confirmation for more prompt laycans; May substitute delivery vessel up to 30 days prior, subject to SSC

Over 18 million mt JKM derivatives cleared over Jan-July 2018, five-fold year-on-year growth

30000

/Lots

- Clip size: 10,000 MMBtu per lot, began in 2012. Trades are can be cleared via ICE or CME, or done OTC
- 2017 witnessed over 50,000 lots cleared on ICE and CME, around 161 cargo-equivalent or 9.7 million mt of LNG
- July 2018 was a record month, with 18,180 lots cleared on ICE and CME, equivalent to approx. 60 cargoes
- Jan-September 2018, JKM Swaps traded nearly 120,941 lots, equivalent to approx. 403 cargoes.

July 2018 a record month, with **3.5 million mt** cleared

25000

20000

15000

10000

5000

0

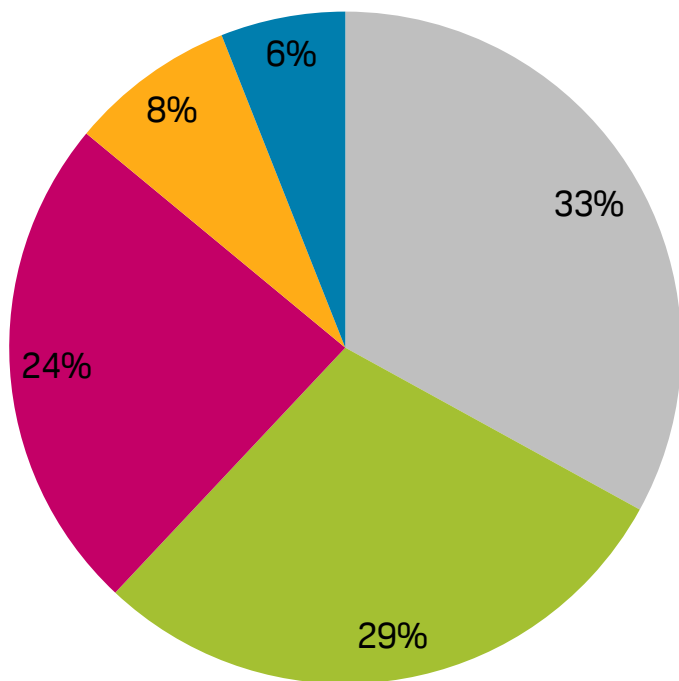
ICE+CME Cleared Volume (lots)

End month OI (lots)

Jan-15 Feb-15 Mar-15 Apr-15 May-15 Jun-15 Jul-15 Aug-15 Sep-15 Oct-15 Nov-15 Dec-15 Jan-16 Feb-16 Mar-16 Apr-16 May-16 Jun-16 Jul-16 Aug-16 Sep-16 Oct-16 Nov-16 Dec-16 Jan-17 Feb-17 Mar-17 Apr-17 May-17 Jun-17 Jul-17 Aug-17 Sep-17 Oct-17 Nov-17 Dec-17 Jan-18 Feb-18 Mar-18 Apr-18 May-18 Jun-18 Jul-18 Aug-18 Sep-18

Source: Platts data/ICE data/CME data

JKM™ Derivatives: Over 40 market participants in both ICE/CME contracts

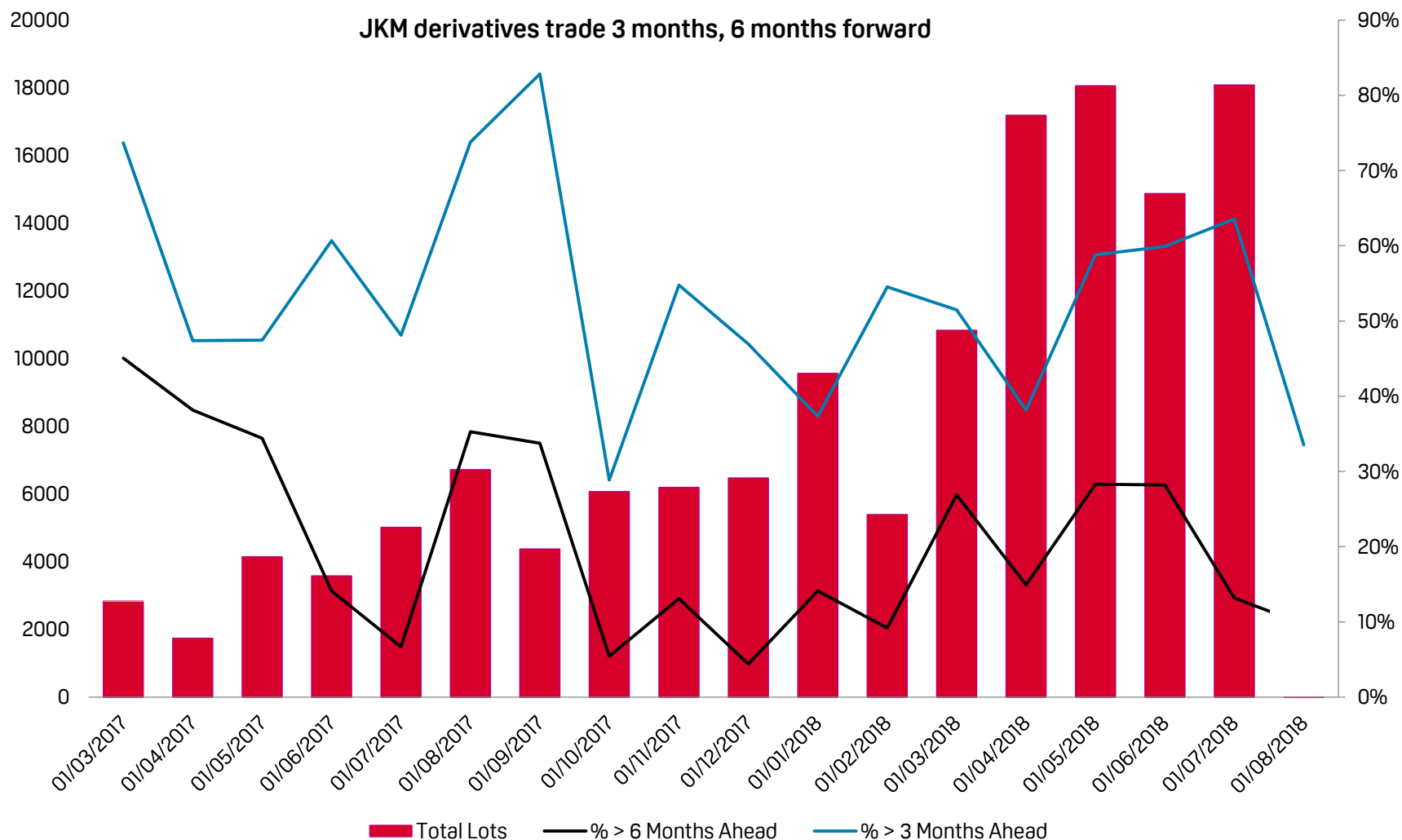


■ Trading Houses ■ Utilities ■ Producers
■ Banks ■ Hedge Funds

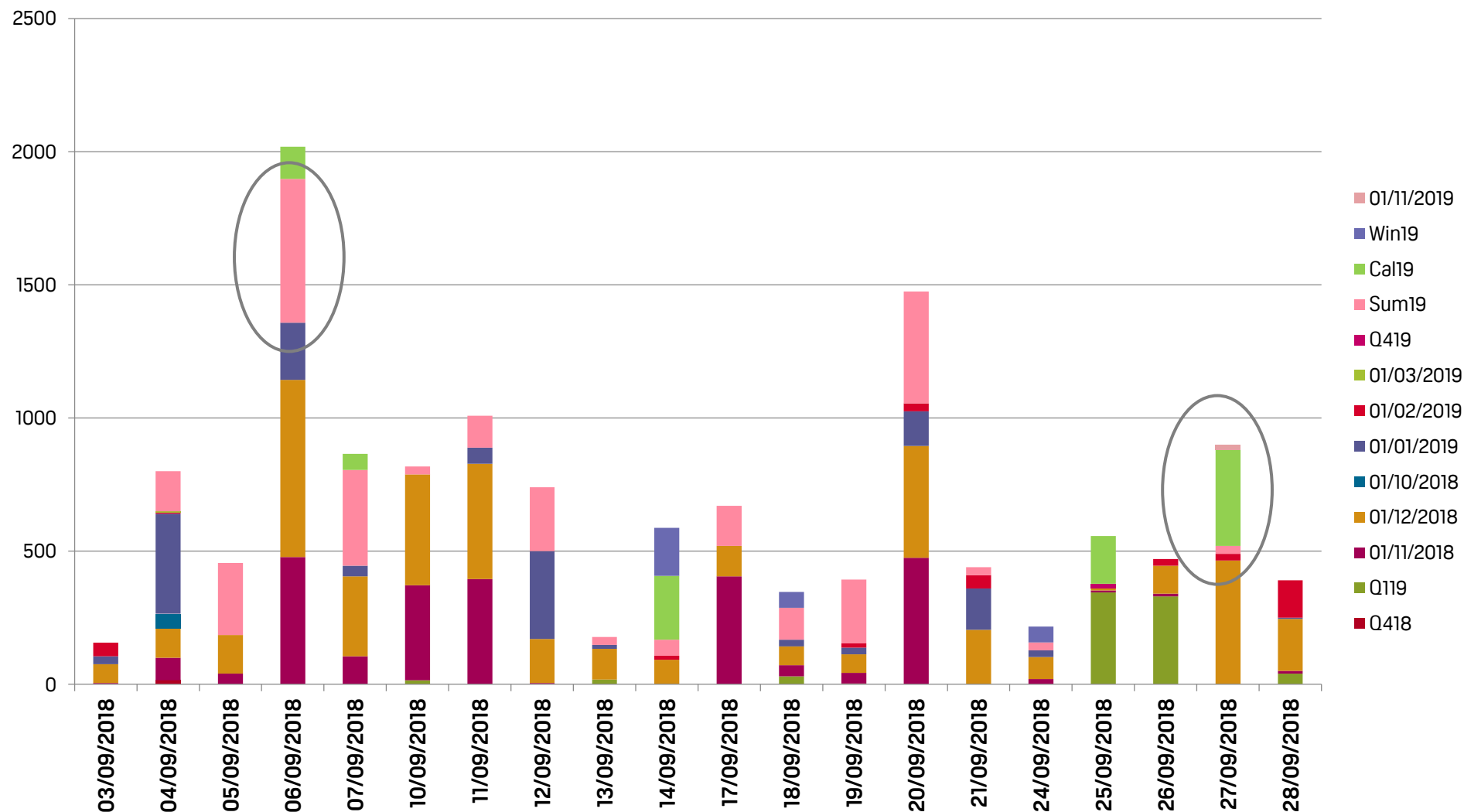
- Market depth and trading horizons have significantly increased
- Over 40 counter-parties set up for trade
- About 15 companies put up bids, offers and trades everyday
- Risk mitigation is the main source of activity, while a growing proportion of transactions are pure trades

Source: ICAP presentation

JKM™ Derivatives: liquidity largely on prompt, forward trading volumes stable



JKM™ Derivatives: 21% of trades on the Summer 19 and 7% of the trades on Cal 19 contracts



Platts proposes to launch JKM derivative London close assessments

Implementation Dec 3, 2018

S&P Global Platts is seeking feedback on a proposal to launch assessments of the JKM derivatives (JKM Swap) at London close from December 3, 2018. The periods of assessment would be the first three prompt months, the following two quarters and a calendar year contract.

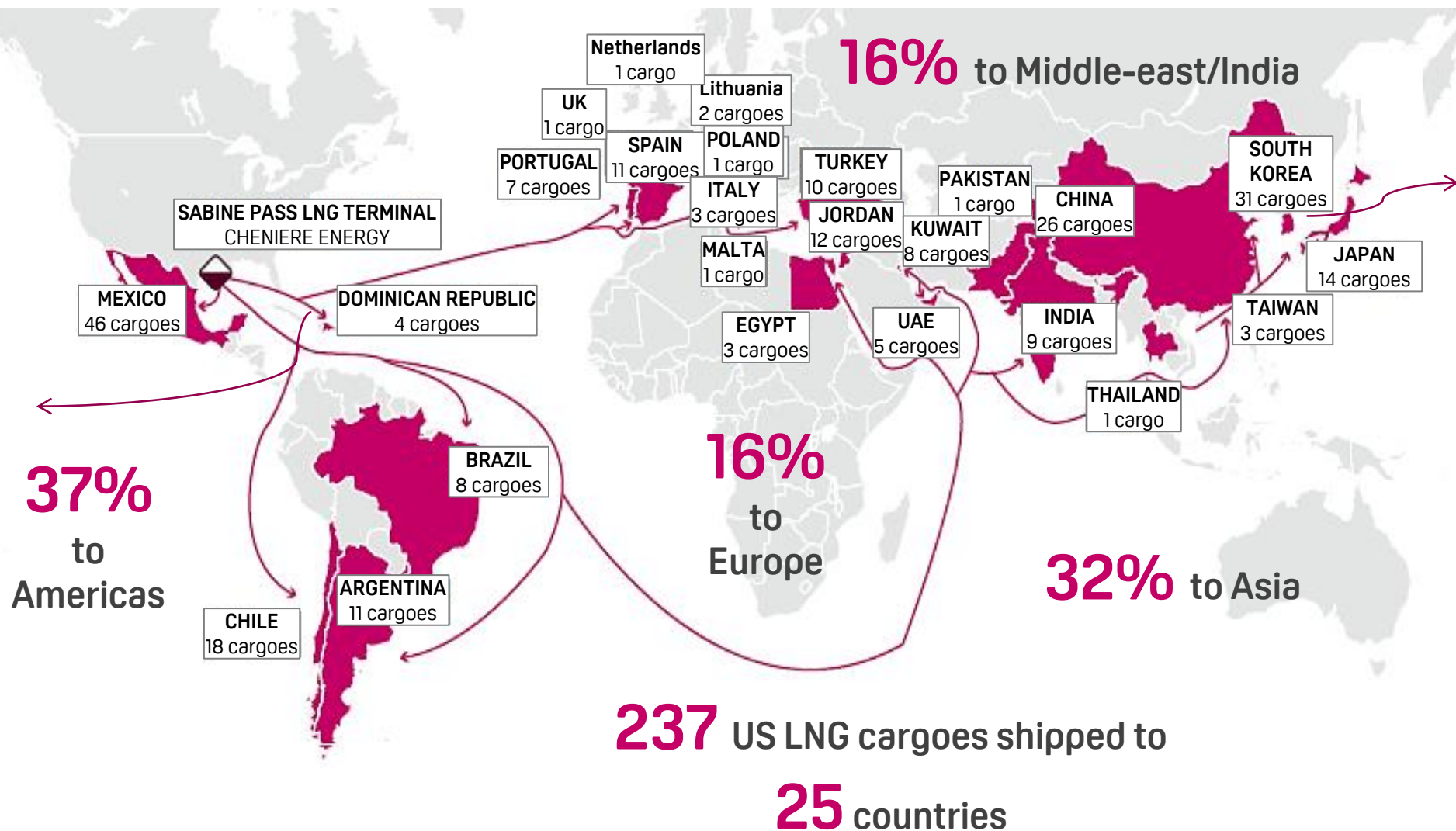
The Platts JKM swap assessments would be published each business day and reflect market values prevailing at the close of European markets, at 4:30 pm London time.

All prices would be quoted in dollars per million British Thermal Units (\$/MMBtu) to three decimal places. Swaps assessments would reflect a standard clip size of 10,000 MMBtu.

Platts invites all questions and feedback to lng@spglobal.com and pricegroup@spglobal.com by October 12.

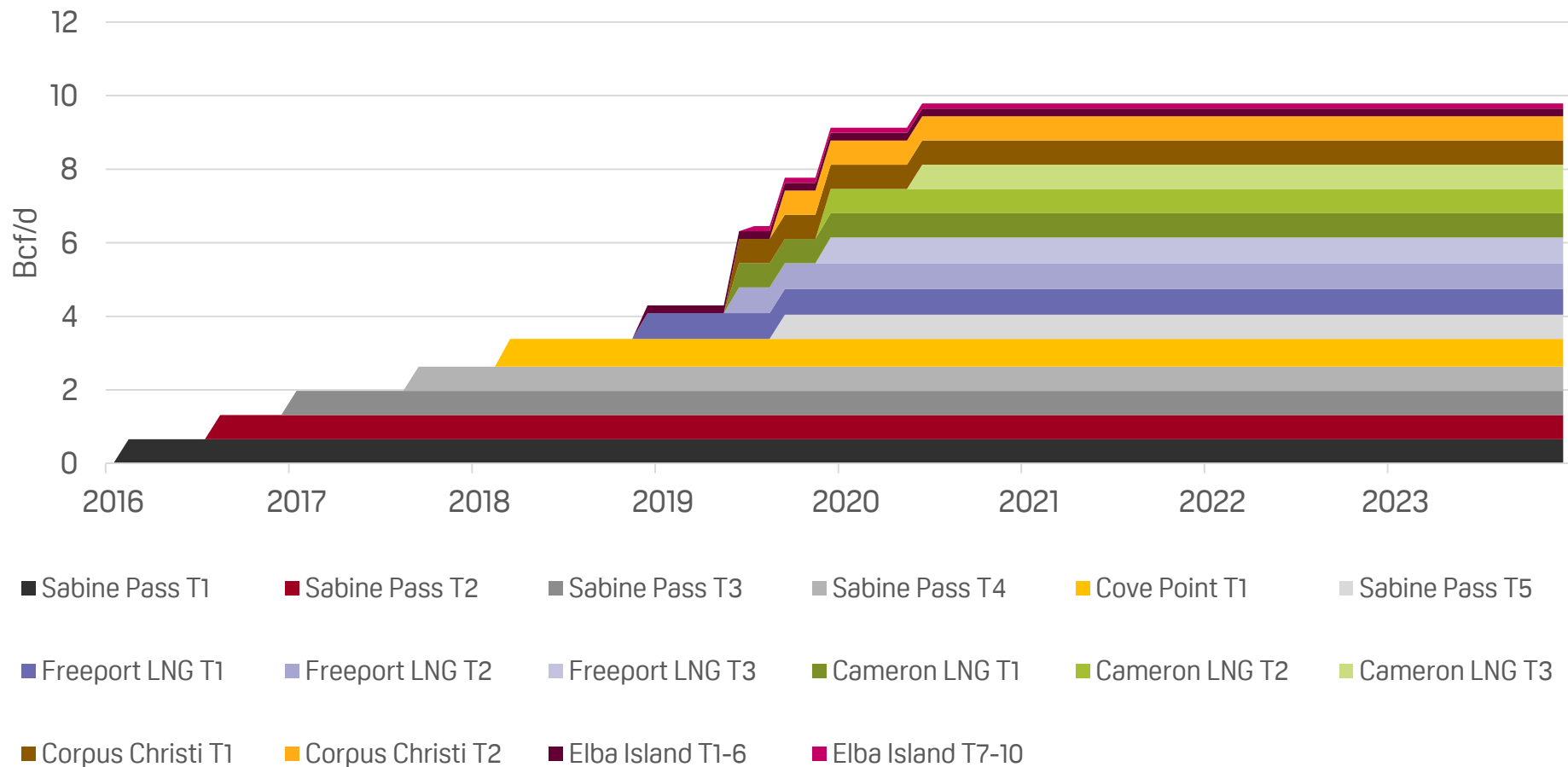
For written comments, please provide a clear indication if comments are not intended for publication by Platts for public viewing. Platts will consider all comments received and will make comments not marked as confidential available upon request.

Latin America and Asia main destinations for flexible US LNG: Feb 2016-Dec 2017



US Gulf output set to rise significantly

US LNG Export Capacity



*Exports capacity displayed is *peak* liquefaction capacity

Q&A

We welcome your feedback

For more information, please contact:

pricegroup@spglobal.com

or

lng@spglobal.com

Subscriber notes on JKM MOC guidelines:

<https://www.spglobal.com/platts/en/our-methodology/subscriber-notes/061118-platts-amends-moc-guidelines-for-jkm-lng-assessments>

<https://www.spglobal.com/platts/en/our-methodology/subscriber-notes/061918-platts-updates-jkm-moc-delivery-window-optionality-volume-guidelines>

<https://www.spglobal.com/platts/en/our-methodology/subscriber-notes/062618-platts-clarifies-guidelines-for-jkm-derivative-moc>

<https://www.spglobal.com/platts/en/our-methodology/subscriber-notes/062718-outright-floating-prices-in-platts-lng-moc-process>