



# GLOBAL LNG MARKETS

Latest update: 29 May 2013



ICIS Heren quotes LNG in Europe, Asia-Pacific, US, and India as follows:

Region	Assessment name	Type	Freq	Units
Asia-Pac	East Asia Index (EAX)	Spot	W	US\$/MMBtu
Asia-Pac	DES Japan	Spot	W	US\$/MMBtu
Asia	DES India	Spot	W	US\$/MMBtu
Europe	DES Spain	Spot	W	US\$/MMBtu
Europe	DES Britain	Spot	W	US\$/MMBtu
South America	DES Argentina	Spot	W	US\$/MMBtu
Europe	UK NBP	Spot	W	US\$/MMBtu
Europe	NW Europe Oil-indexed	Contract	W	US\$/MMBtu
Asia-Pac	Japan Import	Contract	W	US\$/MMBtu
Global	Shipping costs	Spot	W	US\$/MMBtu
Global	Netback Values	Spot	W	US\$/MMBtu

### Recent changes to this methodology

Date	Assessment	Change
07 January 2011	Trades table	Added
19 September 2011	DES US East	Adds Everett and Canaport as other regional ports considered in the assessment.
16 January	EAX	Added.
16 January	Shipping Costs	Rotterdam added.
16 January	Netback Values	Rotterdam added.
16 January	Global DES prices	Roll date brought forward from the end of the calendar month to the 16th.
16 January	DES Japan	Adds Joetsu, Mizushima, Tomakomoi as other regional ports considered.
29 May 2013	DES Argentina	Added.
29 May 2013	DES US East	Removed.
29 May 2013	Shipping Costs	Singapore and Thailand added. Cove Point removed. Nigeria changed to West Africa.
29 May 2013	Netback Values	Singapore and Thailand added. Cove Point removed. Nigeria changed to West Africa.
29 May 2013	Charter Rates	Mid-Term charter rate added.
29 May 2013	Charter Rates	Time period change for Prompt and Long-term Charter rates.
29 May 2013	Charter Rates	Vessel size range narrowed and build date cut off instituted.
Asia-Pac	Asia-Pac	Asia-Pac
Asia-Pac	Asia-Pac	Asia-Pac
Asia-Pac	Asia-Pac	Asia-Pac

To comment on any aspect of this methodology, or to propose changes, please contact Ben Wetherall, Editor GLM, ICIS Heren, on +44 207 911 1786.

ICIS continually develops, reviews and revises its methodologies in consultation with industry participants. Product specifications and trading terms and conditions used aim to reflect typical working practices prevalent in the industry.

## General methodology

ICIS publishes market prices based on information continuously gathered from market participants about: spot transactions; spot bid and offer levels; contract price negotiations; prices of related commodities; and relevant freight costs.

ICIS includes in its price-generation process only information gathered up to the published market close time for each commodity and assessed period. ICIS does not make retrospective adjustments or changes to price quotations based on information subsequently received.

ICIS regards all arm's length transactions that meet its specification criteria as carrying equal weight.

ICIS uses proprietary models where necessary to normalise data to the typical specifications for cargo size and date ranges given for each commodity.

Some ICIS assessments are the product of calculation alone – for example, in markets where insufficient market activity takes place to permit price assessment, or where a market itself habitually sets prices according to a formula. Such calculated assessments are noted as such in their detailed methodology specifications.

ICIS endeavours to crosscheck all the transaction information it gathers. ICIS will not use information for assessment purposes where such checks call into doubt the accuracy of the original information, or where a transaction appears to have occurred under circumstances that render it non-repeatable or otherwise markedly unusual.

## Publication schedule

GLM is published weekly on a Friday year round. Two issues are published in August rather than the usual four per month.

One issue is published over the two weeks of Christmas and the New Year.

Where Friday falls on a UK Bank Holiday GLM is published on the immediately preceding UK working day.

## Timing of assessments

DES assessments will be made for Asian and Middle Eastern locations at 16:30 Singapore time, on the day of publication.

Assessments for European locations are made at 16:30 London time, on the day prior to publication.

Assessments for US and South American locations are made at 14:30 US Eastern Time, on the day prior to publication.

## Global DES prices

The East Asia Index (EAX) is one of five Regional Indices published daily by ICIS Heren.

The EAX is calculated using an arithmetic average of the day's DES front month and second month ahead assessments for Japan, South Korea, Taiwan and China.

All ICIS Heren spot DES assessments give a single value for the named region. This represents the price most likely to transact. The value relates to a specific delivery point within the named region. This delivery point will typically be the most active spot cargo receiving terminal in that region.

Deals and pricing information for other LNG receiving terminals within that region may be accounted for in the final assessment, but may be assessed at a differential to the key discharge port, dependent on market fundamentals and shipping costs. Details for each location are given in the table below.

Two calendar months are assessed. The assessments roll on the 16th of the calendar month. For example, on 16th January, the two front months roll from February and March, to March and April. Where 16th January falls on Saturday or Sunday, the assessments roll on the following Monday.

DES assessments do not take into account the cost of regasification, blending or transport into the domestic network from the LNG import terminal.

Lean and rich cargoes are taken into account in the assessments.

Cargo sizes included in the assessment range from 30,000m<sup>3</sup> of LNG up to 266,000m<sup>3</sup> (Q-Max category). Partial cargoes within this volume range will also be reflected.

Differentials are given against assessments for the same month, in the previous issue of GLM. Where a month is assessed for the first time, no differential will be shown.

## DES assessment points

Contract name	Assessment basis port	Other regional ports considered
Japan	Tokyo Bay	Chita, Himeji, Kawagoe, Niigata, Oita, Sakai, Senbouku, Sodeshi, Tobata, Yanai, Yokkaichi
India	Hazira	Dahej
Spain	Huelva	Barcelona, Bilbao, Cartagena, Ferrol, Sagunto
Britain	Isle of Grain	Dragon, South Hook, Tees-side
Argentina	Bahia Blanca	Escobar

The following DES Points are assessed in sister publication LNG Markets Daily (LMD). These assessments are not published in GLM, but form the basis for the global NETBACK VALUES table published in GLM:

Contract name	Assessment basis port	Other regional ports considered
South Korea	Pyeong Taek	Gwangyang, Incheon, Tongyeong
China	Guangdong	Fujian, Shanghai, Rudong, Dalian
Taiwan	Yung An	Taichung
Singapore	Jurong Island	N/A
Thailand	Map Ta Phut	N/A
Kuwait	Mina Al Ahmadi	N/A
Dubai	Jebel Ali	N/A
Turkey	Marmara	Aliaga
Greece	Revithoussa	N/A
Italy	Rovigo	Panigaglia
Netherlands	Rotterdam	N/A
Belgium	Zeebrugge	N/A
France	Montoir	Fos Cavaou, Fos Tonkin
Portugal	Sines	N/A
US Gulf	Sabine Pass	Lake Charles, Cameron, Freeport, Golden Pass, Gulf LNG
Brazil	Pecem	Guanabara
US Gulf	Sabine Pass	Lake Charles, Cameron, Freeport, Golden Pass, Gulf LNG

## Charter rates

ICIS Heren assesses on a daily basis both Prompt and Mid-term Charter rates for LNG vessels. It assesses Long-term charter rates weekly. The Prompt and Mid-term Charter rates published in GLM are those assessed for LNG Markets Daily on the day of publication.

Short-term is defined as fixtures for a chartering period of up to 90 days, with delivery taken within 40 days.

Mid-term is defined as fixtures for a chartering period lasting between 90 days and 365 days, with delivery to be taken within 40 days of the transaction date.

Long-term is defined as fixtures for a chartering period of between one and seven years, with delivery to start within two years of the transaction date.

Both Atlantic and Pacific basin rates are assessed. Atlantic is defined as west of the Suez Canal and Pacific as east of the Suez Canal.

Vessels of a capacity ranging from 125,000-177,000 cubic metres of LNG will be reflected in these assessments.

Fixtures for vessels outside of this size range may be also be reflected in the assessment but may be adjusted to take into account size-related premia or discounts.

Specifications for all assessments will be restricted to vessels built in or after 1990.

## Forward gas markets: UK NBP (ICIS Heren)

The NBP prices shown are the assessments published the previous day in ICIS Heren's daily gas markets publication European Spot Gas Markets (ESGM). The midpoint of the closing bid/offer spread published in ESGM is converted from p/th to \$/MMBtu. See below for FOREX conversion methodology.

The NBP assessments published in ESGM represent ICIS Heren's close-of-day bid-offer ranges for flat gas (no swing, 100% take-or-pay) delivered at the hub. Curve price assessments are assessed as closely as possible to 16:30 London time at the earliest, or at the time of the latest liquid market if this is after 16:30, on all UK working days, except on

the final working day immediately preceding 25th December and 1st January each year, when these prices are assessed as closely as possible to 12:00 London time.

Prices in ESGM are given in UK pence per therm to three decimal places (1 therm =

100,000 British Thermal Units = 29.3071 kWh).

### **Forward gas markets: Us Henry Hub (NYMEX)**

The six front-month values are the futures settlement prices from the NYMEX exchange (NG contract) on the day prior to publication of GLM.

Where a US public holiday falls on a Thursday and there is no Henry Hub settlement price from NYMEX available, values shown in GLM will be those from the working day immediately preceding the holiday.

### **Contract gas markets (ICIS Heren): NW Europe oil-indexed**

This is an assessed forward curve based on ICIS Heren's modelling of major long-term contract formulae to the German market. They are an average of the assessed forward curves for contracts from Russia, Norway and the Netherlands.

In making its assessments, ICIS Heren models price formulae against historic price information, to create a line of best fit. The formula for the line of best fit is then used as the basis for the current month assessment. Adjustments to this formula are made based on any additional contract information obtained by ICIS Heren. Forward fuels prices are then used to create a calculated forward curve for the contracts. Where forward fuels prices are unavailable, proxy forward fuels markets are used.

Each calculation has several variables which can change on a monthly basis. These modify a fixed contract formula and include:

- A fixed/base price component
- A fuel efficiency multiplier
- Relevant fuel price variables

Fuels data is applied to the contract formula using different reference and lag time periods. For example, typically the reference period for oil product prices is 6 months, applicable for the quarter ahead. However, as this varies with each contract, these time periods will be frequently reviewed.

The contract assessments are revised on a monthly basis, on the first working day of every month, but may remain unchanged for quarterly periods depending on the formula used in each calculation. Prices in formulae which are revised on a quarterly basis will be updated with changes in exchange rate calculations.

The forward assessments will also be updated each month on changes in forward fuel markets prices and exchange rates.

### **Contract gas markets (ICIS Heren): Japan import**

This is an ICIS Heren assessed forward curve of the average price of LNG imported into Japan from long-term contractual suppliers for these periods.

These are calculated assessments, made using historical Japan customs-cleared (JCC) data and forwards oil price data.

These assessments roll on the first issue of GLM following the first working day of each new calendar month.

### **Netback values and shipping costs**

ICIS Heren models the netback value from all of its assessed DES prices to the world's eight major LNG-producing locations.

The netback is calculated using a model that builds incremental forward curves for the world's 21 busiest spot cargo receiving terminals, using ICIS Heren DES assessments. The model then maps sailing times from a 20–40 day FOB loading window onto this forward DES curve to determine potential market prices at destination. The cost of shipping for this voyage is then deducted from the final market price.

Shipping costs from all eight producing regions to all 21 destinations are calculated using ICIS Heren proprietary charter rate assessments, bunker and fuel costs, boil-off, port charges and Suez charges where relevant. All costs are assumed for a round-trip voyage.

## LNG arbitrage outlook

This table shows the arbitrage outlook for cargoes delivered to the US and Europe by comparing actual settled prices at the NBP and Henry Hub over the previous 18 months with the forward pricing as reported by ICIS Heren, the ICE futures exchange and NYMEX for the coming 18 months.

Assessments for both markets are taken from the market close on the day prior to publication.

## NBP vs Henry Hub: front-month contract

This table uses ICIS Heren's NBP assessments and the Henry Hub price reported by NYMEX to compare the current price differential either side of the Atlantic Basin.

Assessments for both markets are taken from the market close on the day prior to publication..

## Henry Hub vs LNG prices

This table compares US Henry Hub futures settlement prices with realised LNG import prices into the US. The Henry Hub settlement prices are taken from NYMEX and the LNG import prices taken from US Department of Energy Data.

## Bunkers: spot delivered prices

Spot delivered prices in \$/tonne. This data comes from Bunkerworld and compares the bunker prices of four different fuels (two grades of Intermediate Fuel Oil, Marine Diesel oil and Marine Gas Oil) in four different markets (Singapore, Houston, Rotterdam, Fujairah).

## Currency conversions

Forward currency rates are calculated using 29 pricing points, sourced from Bloomberg, at 16:30 London time every day. ICIS Heren calculates a full forwards curve from these pricing points, providing rates for each day out to 5 years, allowing conversions to match exactly with the contract periods quoted in publications.

## Trades table

ICIS Heren publishes a list of LNG deals, both FOB and DES on Friday in GLM. This table launched on 7 January 2011, showing trades for LNG delivered as far back as September 2010.

Deals will continue to be published until three months past their delivery date (in the case of DES deals) and loading date (in the case of FOB deals). The full list of deals is available via the ICIS Heren FTP service. For service enquiries please call +44 207 911 1919.

As a result of the relative immaturity of the LNG spot market, some of the details may be reported by ICIS Heren or amended by ICIS Heren as part of the investigative editorial process, following initial discovery of the deal.

In these cases, the date on which the published information changed, will be displayed in the column headed Information Updated. All amendments will feed through automatically to the FTP site.