

China Liquefied Petroleum Gas (LPG) Weekly Methodology

4 June 2018

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Assessments

International

ICIS provides propane and butane price assessments on a CFR (cost & freight) China basis, and the premium/discounts. Please see ICIS pricing methodology documents for these price assessments.

ICIS provides indicative propane and butane prices on a CFR Japan and South Korea basis, and the premium/discounts. These are not price assessments but indicative prices derived from the CFR China price assessments.

Domestic

ICIS assesses domestic and imported mixed LPG prices in south and east China, and the domestic ex-refinery prices of etherified C4 (feedstock gas) in Shandong. Please see ICIS pricing methodology documents for these price assessments.

ICIS publishes propane offer prices (posting prices) from these producers: Guangzhou Petrochemical in south China (for vehicle-use LPG); Gaoqiao Petrochemical in east China; and Jiujiang Petrochemical in central China. These offer prices are not assessments of the producers' transacted prices.

Focus

This section contains analysis articles that address different aspects of the China LPG industry, including demand, supply, operating rates and price trends.

Import market

Refrigerated market

Middle East, US & Asia

A description of the LPG price trends in the US, Middle East and Asia in the publishing week, based on information from industry sources.

China

A description of LPG supply, demand and domestic price trends in China in the publishing week.

Deals in spot market

Middle East, US

A list of transactions heard in the market, indicating the buyers, sellers, transaction prices and loading dates.

Asian Trading Market

A list of transactions heard in the market, indicating the buyers, sellers, transaction prices, delivery dates.

China

A list of bids, offers and deal prices, quoted on a CFR China basis, heard in the market, indicating the buyers, sellers and delivery dates.

Other Asian markets

A list of transaction prices, quoted on a CFR basis, heard in the market, indicating the buyers, sellers and delivery dates.

Indicative LPG freight rates gathered from sources.

LPG imports of Japan, South Korea, Taiwan and mainland China

Imports of butane and propane into Japan, South Korea, Taiwan and mainland China are quoted in metric tonnes. Trade data for Japan, South Korea and Taiwan are gathered from market sources. Data for mainland China is sourced from China Customs.

China's LPG apparent consumption

Domestic output updated monthly, based on a sample of LPG producers, excluding the producers' captive volumes. Import/export trades are official data from the China Customs.

China's LPG Supply

Imported LPG Inventory in China

A chart plots the ratios between imported LPG inventory and LPG storage capacity at 26 terminals at ports in south, east and north China, which have a combined storage capacity of 4.67m cubic metres, and compares those ratios with the respective manageable ratio levels. The inventory and storage capacity do not include the inland terminals used by Sanyuan Petrochemical and Haiwei Group.

Utilisation rates of China's major refrigerated LPG terminals

Utilisation rates presented in percentage for east, south and north China (including Shandong) are derived by dividing the combined inventory of the 26 terminals at the ports with their combined storage capacity. The utilisation rate is updated every Monday.

Imported LPG margins in south and east China

Import margins are derived from the CFR China prices and domestic wholesale prices, taking into account the terminal operation cost and taxes.

Supply in China

A snapshot of:

- 1) Ex-works/ex-tank wholesale prices of domestic mixed LPG, utilisation rates of import terminals (updated on Mondays), import arrivals (updated on Thursdays) in Shandong & north China;
- 2) Wholesale prices of imported and domestic mixed LPG (ex-tank/ex-works), import arrivals (updated on Thursday), and utilisation rates of import terminals (updated on Mondays) in east and south China.

China's LPG Demand

China feedstock LPG consumption

China's feedstock LPG consumption, updated every Wednesday, is tracked according to these etherified C4 deep processing units: aromatisation units, alkylation units, isomerisation units, sec-butyl acetate (SBAC) units, MEK units, C4-propylene units. Consumption is also tracked according to these alkane deep processing units: PDH units, propylene oxide (PO) units, maleic anhydride (MA) units, alkane dehydrogenation units, isobutane dehydrogenation units, and N-butane isomerisation units.

Feedstock LPG consumption mainly includes etherified C4 consumption and alkanes consumption by deep processing units. In ICIS' research, etherified C4-fed deep processing units have a combined capacity of 24.94m tonnes/year, which is 80% of the China's total olefin deep processing capacity; alkane deep processing units have a combined capacity of 9.50m tonnes/years, 75% of the total capacity. Feedstock LPG consumption by MTBE units and crackers is not included in the research.

The chart compares China's feedstock LPG consumption and its total apparent LPG consumption on a monthly basis.

Operation Data of Deep Processing Units

Run rates of deep processing units (etherified C4)

This involves 109 units with a total capacity of 24.94m tonnes/year, which accounts for about 80% of China's total etherified C4 deep processing capacity.

Run rates of deep processing units (alkane)

This involves 36 units with a combined capacity of 9.50m tonnes/year, which accounts for 75% of China's total alkane capacity. The 36 units include PDH units, PO units, BDH units, n-butane isomerisation units, ADH unit and MA units.

Research on the etherified C4 and alkane deep processing run rates involved calling 40 entities per week, of which 34 have both etherified C4 and alkane units. The balance 6 entities each has an etherified C4 or an alkane unit.

Alkylation margin

Alkylation margins are updated every Tuesday, based on an average 80% output ratio for alkylated gasoline.

PDH margin

PDH margins are calculated based on propane costs (CFR China), and propylene wholesale prices in Shandong and east China. Processing costs and unit consumption are also considered.

PDH updates

Weekly status updates of China's PDH plants and projects under construction or planned.

China's LPG importer signed term contracts for propane/butane supply

Contract terms and counterparties are included.

Related products

Wholesale prices of LNG and LPG in east China

A chart that presents the wholesale prices of LNG and LPG in east China, quoted in yuan (CNY) /MMBtu, and their spreads.

Price spreads between naphtha and butane in Asia

A chart that presents the CFR Japan/South Korea prices of naphtha and butane, and spreads.

Other principles and guidelines

Changes to methodology

All market evolve, and ICIS ensures its methodologies for market-reporting evolve in line with the markets.

ICIS therefore regularly conducts internal reviews of the appropriateness of its methodologies.

Draft changes are then made public and feedback requested from industry participants, with a minimum two-week notice period, except where a *force majeure* event (natural disaster, war, bankruptcy of a trading exchange etc.) makes necessary a shorter notice period.

ICIS is committed to reviewing all comments on proposed methodology changes, but in some cases may find it necessary to alter its methodologies against the wishes of some market participants.

Consistency

ICIS achieves consistency among its assessors in exercising their judgment by requiring all assessors to understand and follow this detailed methodology as well as the company's Editorial Standards document. In addition, ICIS employees are required to complete standard training before undertaking the work of a market reporter. Every reporter's work is peer-reviewed daily and spot-checked by senior management.

Adherence to these processes is documented at every stage.

Data standards

ICIS has a public Data Standards Policy which covers the type and quality of information gathered from market participants.

The following principles relate to ICIS gas market assessments and commentaries:

- Where possible, please allow ICIS access to active market traders and allow them to comment on active news stories.
- Where possible, please provide market data from both front and back-office functions.

- Where possible, please provide complete data and not a subsection.
- Flag inter-affiliate transactions.
- Flag sleeve trade.
- Flag spread trades.
- When a source or contact leaves the organisation, please contact ICIS to inform on the replacement (ICIS requests that both the source and the organisation contacts them).
- Where the information is not validated or confirmed by an official source, (i.e. rumour) please indicate as such.

Market communication

ICIS communicates with a broad range of market participants – traders, brokers, back-office employees, supply managers, operations personnel and company executives – to obtain market information.

ICIS communicates with participants by telephone, email, instant messenger and in person. All instant messages, email communication and notes of any in-person communication are archived and details of telephone communication are logged and stored in a database.

ICIS does not accept instant messenger communication from unknown parties. Reporters are required to verify a market participant's identity prior to using instant message communication.

ICIS does not regard attempts by companies to restrict communication with their employees as binding in any way.

ICIS has a duty to its subscribers to obtain the maximum possible amount of market information. ICIS treats all communication from market participants as confidential. ICIS reporters are bound by a Code of Conduct to report to their superiors any coercive or threatening communication from market participants, or any offers of inducements of any kind intended to influence an assessment.

Where improper communication appears to have taken place, ICIS will communicate in the first instance with senior management at the company or companies involved, and if necessary with relevant market authorities.

ICIS expects the highest standards of propriety from all market participants, and regards all communications from market participants as representative of the views of an individual's employer.

ICIS is committed to the highest levels of customer service, and has a formal feedback and complaints policy, which can be viewed here:

<http://www.icis.com/about/icis-feedback-policy>

Market data verification

ICIS will always make best endeavours to confirm bids, offers and transactions with the relevant party/parties. ICIS attempts to cross-check all market data received from a buy- or sell-side participant with the participant's trading counterparty.

Where all counterparties to a transaction cannot or will not confirm the data, ICIS will seek corroboration from other market sources.

Where transaction or bid/offer information was from a trader rather than from a company's back office, ICIS always seeks confirmation from other sources.

Where ICIS has grounds to doubt an item of market data, it may request further evidence that a transaction has taken place, including documentary evidence.

ICIS treats transaction data received from active brokerages as confirmed and treats bid/offer information as firm. This information will be considered in conjunction with other sources during the assessment and index process as described above.

In markets with low liquidity and a low number of participants, ICIS may choose to use unconfirmed data, but only in so far as it is aligned with other market information and comes from a source deemed reliable by ICIS based on previous interactions.

Selection of participants

ICIS policy on general market data is that it welcomes all information regardless of source or constitution as long as it is provided in good faith as true.

However, only active market participants verified as such by existing active industry participants and verified as a viable business by ICIS investigations will be allowed to contribute price data to ICIS for the purpose of assessing tradable market value under this methodology.

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