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China Liquefied Petroleum Gas (LPG) Weekly Methodology

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LPG price

International

ICIS provides propane and butane price assessments on a CFR (cost & freight) China basis. 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. 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 Shandong, 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 price (posted price) from Gaoqiao Petrochemical in east China. This offer price is not assessments of the producers' transacted price.

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.



East Asia LPG Imports

Imports of butane, propane and other LPG into Japan, South Korea, Taiwan and mainland China are quoted in metric tonnes. Trade data for Japan, South Korea, Taiwan and mainland China is sourced from ICIS Supply and Demand Database.

China's LPG apparent consumption

ICIS' China LPG monthly output data reflects 229 LPG suppliers in China, including refineries, deep processing units and MTO/CTO plants, and the data is derived based on the assumption that LPG production from all these suppliers are unchanged unless their operations stopped for different reasons, including planned maintenance or technical issues, or unless their captive usage increases due to start-up of downstream deep processing units. At the start of each month, ICIS estimate the output losses of these 229 suppliers in the previous month by tracking their planned and unplanned shutdowns. The actual total output of these 229 suppliers are then derived by deducting the estimated total output losses from their assumed combined output. The data population size is adjusted as and when an LPG supplier comes on stream. 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 40 terminals at ports in south, east and northern China (including Shandong, north China and northeast China), which have a combined storage capacity of 10.26 million cubic metres, and compares those ratios with the respective manageable ratio levels. The inventory and storage capacity do not include the inland terminals.

Utilisation rates of China's refrigerated LPG terminals

Utilisation rates presented in percentage for east, south and northern China (including Shandong, north China and northeast China) are derived by dividing the combined inventory of the 40 terminals at the ports with their combined storage capacity. The utilisation rate is updated every Monday.

Monthly imported LPG margins in south and east China

Monthly import margins are derived from the monthly averages of CFR China prices and domestic wholesale prices, taking into account the terminal operation cost and taxes.



China's LPG Demand

China weekly feedstock LPG consumption

China's weekly feedstock LPG consumption, updated on Wednesdays, is tracked according to China's alkylation 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 by alkylation units and alkanes consumption by deep processing units. ICIS research involves 67 units with a total capacity of 15.57 million tonnes/year, accounting for around 54% of the total alkylation capacity in China, excluding state-owned alkylation units; alkane deep processing units have a combined capacity of 28.95 million tonnes/years, almost 89.6% of the total capacity. Feedstock LPG consumption by MTBE units and crackers is not included in the research.

Operation Data of Deep Processing Units

Run rates of deep processing units (etherified C4)

ICIS research involves 67 units with a total capacity of 15.57m tonnes/year, accounting for around 54% of the total alkylation capacity in China.

Run rates of deep processing units (alkane)

This involves 74 units with a combined capacity of 28.95 million tonnes/year. The 74 units include PDH units, PO units, BDH units, n-butane isomerisation units, ADH unit and MA units.

China PDH margin

ICIS China PDH margin is a variable margin, providing an assessment of the ex-works cash margin obtained for the product over raw material costs and key variable manufacturing costs, including power and steam, chemicals and catalysts. This margin is based on the CFR China propane and ex-tank east China propylene assessments. This margin is updated every Friday.



Deep processing unit updates

PDH updates

Weekly status updates of utilisation rates of China's PDH plants

Turnaround updates

Weekly updates of planned and unplanned turnarounds at etherified C4 deep processing units and alkanes deep processing units. Historical turnarounds happened in the previous three months are also presented in the table.

Expansion updates

Weekly updates of China's new PDH and crackers capacities expected to be operational in the present year and the following year.

China's monthly LPG demand

China's monthly feedstock LPG consumption

China's feedstock LPG consumption, updated every Wednesday, reflects domestic and imported LPG consumption by these etherified C4 deep processing units: aromatisation units, alkylation units, isomerisation units, sec-butyl acetate (SBAC) units, MEK units, C4-propylene units. The consumption data also reflects usage by 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, as well as the imported LPG consumed by steam crackers.

In ICIS' research, etherified C4-fed deep processing units have a combined capacity of 21.41 million tonnes/year, which is 52% of the China's total etherified C4 deep processing capacity; alkane deep processing units have a combined capacity of 28.95 million tonnes/year, which accounts for almost 89.6% of the total capacity; steam crackers that consume imported LPG have a combined capacity of 13.32 million tonnes/year, which covers all of China's steam crackers that consume imported LPG. Steam crackers that consume domestically-produced feedstock LPG and feedstock LPG consumption by MTBE units is not included in the research. The chart compares China's feedstock LPG consumption and its total apparent LPG consumption on a monthly basis.



Monthly consumption of imported LPG

A chart that presents the volume of LPG imports consumed by crackers and PDH units and corresponding percentages against current-month total LPG imports. At the end of every month, ICIS tracks the consumption of imported LPG by all companies in China that use imported LPG for ethylene production, which has a combined capacity of nearly 13.32 million tonnes/year; ICIS estimates the consumption according to the planned and unplanned shutdowns of the plants, while also taking into consideration of LPG flexibility in the feedstock mix of those plants as well as price spreads of LPG and other feedstocks. ICIS calculates imported propane consumption by PDH units based on weekly survey on China's alkane deep processing unit operation, which have a combined capacity of 21.99 million tonnes/year. The corresponding percentages in the current month will be revised in the following month because China's LPG import data in the current month is not released in ICIS Supply and Demand Database and is based on ICIS shipping data consequently. The chart is published on the last Thursday of the current month, or the first Thursday in the following month. Updates of the percentages will be highlighted in red.

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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