S&P Global
Platts

Methodology and Specifications Guide
Global M2M LNG Quantitatively Modeled Forward Curves (JKM)

Latest update: March 2022

SCOPE

This document describes the algorithms used to quantitatively estimate a market-reflective forward curve for both the JKM and LNG Gulf Coast Marker for the periods past the end of the editorially assessed periods (currently the third forward year for JKM and Month-1 for GCM) and used to estimate the monthly curve shape in the periods that do not have monthly editorial assessments (currently the balance of the forward quarter, the second forward quarter, the first forward season, the second forward season and the three forward years for JKM only).

JKM FORWARD CURVE

ASSUMPTIONS AND CURVE MODELING

The JKM market is, in many ways, one of the most dynamic in the world: certainly not in terms of daily volatility, but rather in terms of its fundamental drivers. Being a waterborne market, its suppliers are not fixed in geography or volume, and with growing demand, it is exerting a giant pulling force on every gas market that is connected to the water.

In the short-term (next 36-48 months, depending on when in the year), there are assessed values for JKM – those are used directly, with only adjustments for seasonality. For the longer term, we use other markets in combinations described below.

We believe that there are three "forcing" markets that affect JKM. The first is oil. Most consuming markets in the JKM region have oil/gas switching capability, and prior to the rise of the merchant LNG supplier and gas-on-gas competition in JKM, most contracts were executed on a slope to oil, customarily Brent. This dynamic persists in the region, though not as strongly as previously. We have chosen to model a slope to Brent as a general driver to the long term price and an absolute ceiling to the long term price.

The second is Qatari natural gas. As the world's largest single supplier, sitting in-between the two largest consumers of LNG (JKM and Europe), with increasing destination flexibility, Qatari gas is expected to be an arbitrage player between the two markets. However, since there is no market price for Qatari gas, we must impute the effect on JKM by using the competing market, TTF, and a netback assumption. If we assume that the Qataris will send their gas to the market with the best netback, we use the TTF forward prices, and Platts' assessed shipping rates between northwest Europe and the Mideast, and between the Mideast and JKM to establish a floor for prices in the JKM region from TTF. If JKM consumers bid any lower than that floor, they will lose cargos to Europe.

The last is the newest, Henry Hub prices. With the US Gulf Coast as the second-largest supplier, and some projections moving it into number one near the end of our four-year window, a very similar argument to the Qatari one can be made, but with the advantage of an observable market. We use Henry Hub, with estimates of shipping, liquefaction and regasification costs, as another floor of the market in JKM.

Given the changing nature of the Pacific LNG markets, we routinely monitor the JKM markets for developments as these effects charge.

CURVE LEVEL DETERMINATION

The current model separates the determination of overall price level and seasonality.   First we determine the "average" level of prices at any point, then we apply the seasonality to those levels.

 The overall level of each of the "forcing" prices is determined by the 12-month centered moving average of that price. Until the end of the assessed period, we directly use the editorially assessed value to determine the level. At the end of the assessed period, we begin a sigmoid-shaped transition over an approximately 18 month period to our long-term price level, which is midway between Brent and destination TTF, as advised by the editorial and analytics teams.

SEASONALITY

Seasonality can be defined as the ratio between the price in a market and the average price, and that is what we use. Increasingly, the JKM market exhibits seasonality, however, there is little direct information on what that might be, so we must use the forcing markets, specifically HH & TTF.   Henry Hub exhibits an unacceptable summer "hump" due to air conditioning demand in the US that we do not believe exists in the JKM markets, so we use TTF seasonality as the driving element of seasonality.

JKM EXPIRY AND FRONT MONTH

The model accounts for the fact that JKM, Brent, TTF and Henry Hub have different front months and expiry days. In addition, the JKM forward curve expires on 15th of each month.

Valuation date	JKM Mo01
From 1st to 15th of month M (example: 1-15 September)	Current Month M+2 (Mo01 = November)
From 16th to end of month M (example: 16-30 September)	Current Month M+3 (Mo01 = December)

JKM SYMBOLS

MDC	Relative / Absolute	Symbol	Suffix	Symbol Description
LF [1]	Relative Months	LJKMO01 LJKMO02 LJKMO03 LJKQR01 LJKQR02 LJKSN01 LJKSN02 LJKYR01 LJKYR02 LJKYR03	N/A	LNG Japan/Korea swap $/Mmbtu Mo01 LNG Japan/Korea swap $/Mmbtu Mo02 LNG Japan/Korea swap $/Mmbtu Mo03 LNG Japan/Korea swap $/Mmbtu Qr01 LNG Japan/Korea swap $/Mmbtu Qr02 LNG Japan/Korea swap $/Mmbtu Sn01 LNG Japan/Korea swap $/Mmbtu Sn02 LNG Japan/Korea swap $/Mmbtu Cal Yr01 LNG Japan/Korea swap $/Mmbtu Cal Yr02 LNG Japan/Korea swap $/Mmbtu Cal Yr03
DLF	Relative Months	QJKMOxx	[xx = 04 – 99]	LNG Japan/Korea M2M Financial $/Mmbtu Mo$xx$ [xx = 04 – 99]
DLF	Relative Months	QJKMxxx	[xxx=100-240]	LNG Japan/Korea M2M Financial $/Mmbtu Mo$xx$ [xxx = 100 – 240]
DLF	Absolute months	QJKMxyy	x is the code month yy is the code year	LNG Japan/Korea M2M Financial $/Mmbtu mmm-yy Code – Month: F - Jan, G - Feb, H - Mar, J - Apr, K - May, M - Jun, N - Jul, Q - Aug, U - Sep, V - Oct, X - Nov, Z - Dec

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[1] This is for information only, this document does not describe methodology of LF symbols that belong to Editorial Assessments

LNG GULF COAST MARKER FORWARD CURVE

NETBACK MODEL

There is currently no liquidity to form an independent price assessment of a USGC LNG derivatives forward curve, and the FOB rate of Henry Hub plus approximate liquefaction charges is clearly an insufficient representation of the current market value of LNG originating on the USGC. Therefore, we use a destination minus freight, best-netback model to represent the value of the LNG on the dock in the USGC. There are three major markets that will form the bulk of the destinations for USGC cargos for the foreseeable future: Japan area, Northwest Europe, and Latin America (primarily Mexico). Unfortunately, there are no markets to give us price signals in Latin America, so we must rely on the other two markets for sufficient pricing.

Specifically, the LNG Gulf Coast Marker Quantitative Forward Curve is computed as highest netback value (destination LNG minus freight costs) of the Gas forward curves below, and calculated freight rates.

Route	Freight Fwd curve	Gas Fwd curve
USGC-Japan	Sabine to Japan via Best Route	JKM Swap
USGC-UK	Sabine to NWE	NBP Swap
USGC-NWE	Sabine to NWE	TTF Swap

Where the Best Route is the minimum shipping cost via the Panama Canal, the Suez Canal and Cape Horn.

FREIGHT MODEL

Each freight forward curve uses Platts' assessed values for shipping for each of the noted routes.

GAS FORWARD CURVES

Platts assesses a NBP and TTF forward curve on a daily basis. Moreover, Platts also publishes a JKM Swap quantitative forward curve. These curves are used as input to compute the highest netback forward value.

LNG GCM EXPIRY AND FRONT MONTH

The LNG GCM forward curve expires on the last business day of the month. The published front month corresponds to the month following the one of the valuation date. (e.g. M-1 for curve of 20 Sep starts on 1 Oct.).

LNG GCM SYMBOLS

MDC	Relative / Absolute	Symbol	Suffix	Symbol Description
LF [2]	Relative	LGCSM01	N/A	LNG FOB Gulf Coast Spot Cargo Mo01
DLF	Relative Months	QGCSMxx	[*xx* = 01 – 48]	LNG FOB Gulf Coast Cargo $/Mmbtu Moxx [xx = 01 – 48]
DLF	Absolute months	QGCMxyy	x is the code month yy is the code year	LNG FOB Gulf Coast Cargo $/Mmbtu mmm-yy Code – Month: F - Jan, G - Feb, H - Mar, J - Apr, K - May, M - Jun, N - Jul, Q - Aug, U - Sep, V - Oct, X - Nov, Z - Dec

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REVISION HISTORY

Mar 2022- Extended JKM curve to 240 months

May 2020- For Jkm: added new assessments, changed long term trend methodology, extended curve to 72 months

January 2020 – Renamed the guide to make a clear distinction between the methodology underpinning assessed curves and assessments versus quantitatively modelled curves

Aug 2019 – Minor edits, clarifications.

Mar 2019 – Added scope to make clear that this describes quantitative curves only. Minor edits.

Feb 2019 – JKM complete rewrite to accommodate new, simplified methodology. GCM explanation edits, no changes to model.

July 2018 – Add GCM methodology

Methodology

https://www.spglobal.com/platts/en/our-methodology/methodology-specifications/natural-gas

Disclaimers