

OPIS Global LPG & Naphtha Market Methodology

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This document outlines the methodology employed by OPIS, a Dow Jones company, in the assessment of daily and weekly Global LPG & Naphtha prices.

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Introduction

OPIS methodologies are developed in consultation with market stakeholders to ensure fair, accurate, and representative price assessments. Each benchmark is underpinned by clearly defined processes that reflect actual market behavior and conditions. [View OPIS Spot Price Assessment General Methodology here.](#)

Price Discovery

OPIS applies a full-day assessment process across all covered markets, gathering, testing and evaluating pricing data throughout the trading session. OPIS Global LPG & Naphtha spot price assessments are published daily.

Data submission timeframes are specified in this guide for each region's price assessments. Information on publishing dates is made publicly available through the [OPIS Holiday Publishing Schedule](#). Registered stakeholders are notified in advance of any schedule changes.

OPIS Average prices represent the numerical mid-point of the OPIS Low and the OPIS High, assessed using spot market data discovered during the data submission timeframe. Last prices represent where OPIS assesses spot market close based on market data discovered at the data submission deadline. Locate the market specific OPIS Price Code reference and API codes [here](#).

Shipping

Data Submission

OPIS shipping assessments reflect pricing information submitted between 9 a.m and 5 p.m. London time.

LPG Spot Freight Rates

OPIS assesses daily prices for LPG freight across international routes. Market data received for timings outside the prevailing cycle and standard terms can also be considered for assessment in the event of an illiquid market.

Route

- **Ras Tanura–Chiba (AG-Japan)**
- **Houston–Flushing**
- **Houston–Chiba**
- **Ras Tanura–India**

Vessel Class: Very Large Gas Carrier (VLGC)

- **Cargo size:** 46,200 metric tons, which is equivalent to the high end of 44,000 mt plus/minus 5%
- **Cargo grades:** 1 to 2 grades, fully refrigerated LPG i.e. propane, butane or LPG-mix
- **Sea margin:** 5%
- **Broker Commission:** 1.25% - Address commission is not included.

Timing

- **Ras Tanura–Chiba:** Loadings 10-30 days forward from the day of publication.
- **Houston–Flushing:** Second forward half-month cycle from the day of publication. For example, on August 1st, the second forward half-month cycle is the first-half of September.
- **Houston–Chiba:** Second forward half-month cycle from the day of publication.
- **Ras Tanura–India:** Loadings 10-30 days forward from the day of publication.

Pricing Mechanism: US \$/mt

LPG Time Charter Equivalent Rates

OPIS calculates daily Time Charter Equivalent (TCE) Rates for four international routes, which are then used to calculate a US \$/mt equivalent freight rate for OPIS LPG OMBD and Delivered prices via specific routes into Asia, Africa, Europe & Mediterranean, and Latin America.

Routes

- **Ras Tanura–Chiba (AG-Japan)**
- **Houston–Flushing**
- **Houston–Chiba**
- **Ras Tanura–India**

Vessel Class: Very Large Gas Carrier (VLGC)

Specifications: Vessels are assumed to load bunker fuels prior to the laden leg of the round trip, using 0.5% Very Low Sulfur Fuel Oil (VLSFO), and 0.1% Low Sulfur Marine Gasoil (LSMGO) or DMA in sulphur emissions control areas (SECA). LSMGO consumption is also assumed for power auxiliary systems at port.

The bunker fuel for the nearest load port or bunker hub is used in the calculation for the desired route given vessels are assumed to have loaded bunker fuels for the laden leg of the voyage.

Port costs and timings are reviewed on an annual basis.

Calculation

- **VLGC TCE (\$/day)** = ((OPIS VLGC Spot Freight Rate x Cargo Size) – Costs)/Voyage Duration.
- **Houston–Chiba TCE:** VLGC rate assumes one day laden and one day ballast at the Panama Canal. All routes assume 6 hours Notice of Readiness (NOR) at each port.
- **Ras Tanura–India (Basis Ras Tanura–Chiba) TCE:** Using the voyage parameters and misc. costs of the Ras Tanura-Chiba voyage, the time charter equivalent (TCE) rate is calculated from the daily assessed Ras Tanura-India spot \$/mt rate to create a \$/day figure. The Ras Tanura-India route includes an Additional War Risk Premium (AWRP) of \$70,000.

LPG Time Charter Equivalent Rates Calculation Specifications

VLGC Specifications	Value	
Deadweight tonnage (DWT)	55,000	
Gross tonnage (GT)	49,000	
Net register tonnage (NRT)	17,000	
Length (m)	226	
Beam (m)	37	
Laden/Ballast speeds (knots)	15	
Laden/Ballast VLSFO fuel consumption (mt/day)	38	
Port VLSFO fuel consumption (mt/day)	10	
Laden/Ballast LSMGO fuel consumption (mt/day)	0.2	
Port LSMGO fuel consumption (mt/day)	0.25	
VLGC Port	Cost	Timing
Ras Tanura	\$12,000	2 days loading
Chiba	\$75,000	2 days discharge
Houston	\$45,000	2 days loading
Flushing	\$85,000	2 days discharge
New Mangalore	\$85,000	3 days discharge
Haldia	\$95,000	4 days discharge

Pricing Mechanism: US \$/day

12-month Time Charter Rates

OPIS assesses an Average price for 12-month period charter rates for Midsize Gas Carriers (MGC) each week on Monday, which represent the price to fix a vessel from the previous week. In the event that Monday is a publishing holiday, the 12-month Time Charter Rates will publish the following business day.

Data Submission

OPIS weekly 12-month Time Charter Rates assessments reflect pricing information submitted for MGC vessels by 4 p.m. London time on Monday.

Vessel Class

- **MGC (38,000 cbm):** Midsize Gas Carrier 38,000 cubic meters
- **MGC (40,000 cbm):** Midsize Gas Carrier 40,000 cubic meters

Pricing Mechanism

- US \$/month
- US \$/day

Naphtha Spot Freight Rates

OPIS assesses daily prices for Naphtha freight across international routes. Market data received for timings outside the prevailing cycle and standard terms can also be considered for assessment in the event of an illiquid market.

Route and Vessel Class

- **Sing–Japan Tanker 30kt:** Singapore-Japan, Medium Range (MR) Tanker
- **AG–Japan LR 1:** Arab Gulf-Japan, Long Range 1 Tanker
- **AG–Japan LR 2:** Arab Gulf-Japan, Long Range 2 Tanker

Timing: 15-30 days forward

Pricing Mechanism: US \$/mt

EU CAP Costs LPG Freight

OPIS calculates a daily EU ETS Cap-at-the-Port (EU CAP) price for LPG freight on routes originating in the US and delivering in Europe.

Routes & Products

- **Houston–Flushing EU CAP**
 - LPG Freight VLGC
 - LPG Freight (Propane) MGC (38,000 cbm)
 - LPG Freight (Butane) MGC (38,000 cbm)
 - LPG Freight (Propane) MGC (40,000 cbm)
 - LPG Freight (Butane) MGC (40,000 cbm)
- **Houston–Lavera EU CAP**
 - LPG Freight VLGC
- **Marcus Hook–Flushing EU CAP**
 - LPG Freight VLGC
 - LPG Freight (Propane) MGC (38,000 cbm)
 - LPG Freight (Butane) MGC (38,000 cbm)
 - LPG Freight (Propane) MGC (40,000 cbm)
 - LPG Freight (Butane) MGC (40,000 cbm)

Calculation

The OPIS Europe Marine Cap-at-the-Port (CAP) \$/mt Non-Jurisdictional EU CAP price is applied for voyages that originate outside of the EU and destined for ports of discharge which are located within the EU. This price premium is calculated on fuel consumption on both the laden and ballast legs from Houston into ports in Flushing and Lavera and additionally calculated on in port consumption of conventional marine fuels.

The total value of this EU CAP premium on the round voyage is then divided by the intake of the respective vessel sizes trading on these routes in order to calculate a \$/mt equivalent on these routes.

For the MGC assessments, OPIS calculates the EU CAP price by taking an average of both propane and butane parcel sizes.

More information on the OPIS Europe Marine Cap-at-the-Port (CAP) can be found in OPIS Global Marine Fuels Market Methodology [here](#).

Pricing Mechanism: US \$/mt

North America

LPG FOB Resale Prices

OPIS assesses resale prices and differentials for Very Large Gas Carrier (VLGC) size FOB cargoes of LPG. Resale Differentials represent a differential range (cts/gal) to OPIS Mont Belvieu non-TET (EPC) propane and OPIS Mont Belvieu non-TET (EPC) normal butane on the day. Resale differentials are also known as spot terminal fees in industry practice.

Data Submission

Resale Differential assessments reflect pricing information submitted between 9 a.m.-2 p.m. U.S. Eastern time (2 p.m.-7 p.m. U.K. time).

Products & Specifications

- **Propane FOB USGC Resale Diff:** Loading FOB at U.S. Gulf Coast terminals (Enterprise, Targa, Nederland and Freeport). Specification is fully-refrigerated export-grade low-ethane propane (maximum 2% ethane).
- **Butane FOB USGC Resale Diff:** Loading FOB at U.S. Gulf Coast terminals (Enterprise, Targa, Nederland and Freeport). Specification is fully-refrigerated export-grade normal butane (maximum 0.35% propane and maximum 6% isobutane).
- **LPG (2:2) FOB USGC Resale Diff:** Loading FOB at U.S. Gulf Coast terminals (Enterprise, Targa, Nederland and Freeport). 2:2 represents a ratio of two tanks of propane to two tanks of normal butane.
- **Propane FOB USEC Resale Diff:** Loading FOB at the U.S. East Coast terminal (Marcus Hook). Specification is export-grade low-ethane propane (maximum 2% ethane).
- **Propane FOB WC Canada Resale Diff:** Loading FOB at the Western Canadian terminal (Prince Rupert). Specification is fully-refrigerated export-grade low-ethane propane (maximum 2% ethane).

Volume: Up to a full size VLGC

Timing

- **FOB USGC Propane Resale Diff:** Two forward half-month cycles
- **FOB USGC Butane Resale Diff:** Two forward half-month cycles
- **FOB USGC LPG (2:2) Diff:** Forward half-month cycle
- **FOB USEC Propane:** Forward half-month cycle

- **FOB WC Canada Propane:** Forward half-month cycle

Roll

- Half-month cycles roll at the new calendar month and at mid-month
- **1H:** The first half-month cycle begins at least a half calendar month ahead of the daily assessment date and up to one calendar month ahead of the daily assessment date
- **2H:** The second half-month cycle begins at least one calendar month ahead of the daily assessment date and up to 1.5 calendar months ahead of the daily assessment date

Calculation

- **Propane FOB USGC Resale:** Calculated by the sum of OPIS Mont Belvieu Enterprise (Non-TET) Propane Anys daily assessment and the OPIS Propane FOB USGC Resale Differential for the first half cycle.
- **Butane FOB USGC Resale:** Calculated by the sum of OPIS Mont Belvieu Enterprise (Non-TET) Butane Anys daily assessment and the OPIS Butane FOB USGC Resale Differential for the first half cycle.
- **LPG (2:2) FOB USGC Resale:** Calculated by the sum of the average of the daily OPIS Mont Belvieu Enterprise (Non-TET) Propane Anys and OPIS Mont Belvieu Enterprise (Non-TET) Butane Anys assessments and the OPIS LPG (2:2) FOB USGC Resale Differential for the first half cycle.
- **Propane FOB USEC Resale:** Calculated by the sum of the daily OPIS Mont Belvieu Enterprise (Non-TET) Propane Anys Average and the OPIS Propane FOB USEC Resale Differential for the first half cycle.
- **Propane FOB WC Canada Resale:** Calculated by the sum of the daily OPIS Mont Belvieu Enterprise (Non-TET) Propane Anys Average and the OPIS Propane FOB WC Canada Resale Differential for the first half cycle.
- Conversion rate from cts/gal to \$/mt is 5.21 for propane and 4.53 for normal butane

More information on the OPIS North America NGL Market Methodology can be found [here](#).

Daily Pricing Mechanism

- US cts/gal
- US \$/mt

Naphtha

More information on OPIS U.S. Gulf Coast Naphtha prices can be found in the OPIS International Feedstocks Market Methodology [here](#).

Middle East

Data Submissions

Middle East LPG and Naphtha assessments reflect pricing information submitted before 6:00 p.m. Singapore time.

LPG Spot Prices

OPIS assesses daily Low, High and Average spot prices and cash differentials for refrigerated propane and butane loading from the Middle East.

Products and Specifications

- **Propane:** Refrigerated cargoes with specifications that align with commercial field-grade quality.
- **Butane:** Refrigerated cargoes with specifications that align with commercial field-grade quality.

Location: FOB Arab Gulf, loading from major ports across the Middle East

Timing: Cargoes loading in the following calendar month from the publication date.

Roll: Rolls on the first day of the new calendar month.

Volume: 44,000-46,000 mt

Calculation: FOB Arab Gulf propane and butane assessments are calculated by applying the prevailing FOB Arab Gulf diff to the prompt-month Saudi Contract Price (CP) swap.

Monthly Contract Price

OPIS publishes the monthly propane and butane contract price (CP) as set by Saudi Aramco for the prevailing month for term cargoes loading FOB in the Middle East.

Pricing Mechanism: Monthly, US \$/mt

Naphtha Spot Prices

OPIS assesses daily Low, High and Average physical prices and cash differentials for naphtha loading from the Middle East. Cash differentials are assessed against FOB Arab Gulf LR1 assessments.

Product and Specifications

- **Open Spec Naphtha:** Meets typical producer specifications for Arab Gulf export cargoes.

Location:

- **FOB Arab Gulf LR1:** Loading from major ports in the Middle East.
- **FOB Arab Gulf LR2:** Loading from major ports in the Middle East.

Timing: Loading 20-40 days forward from the day of publication.

Volume

- FOB Arab Gulf LR1: 55,000 mt
- FOB Arab Gulf LR2: 75,000 mt

Calculations

- **FOB Arab Gulf LR1:** Assessed as a freight netback for a 55,000 mt cargo from the CFR Japan Physical Naphtha assessment
- **FOB Arab Gulf LR2:** Assessed as a freight netback for a 75,000 mt cargo from the CFR Japan Physical Naphtha assessment

Pricing Mechanism: US \$/mt

Asia

Data Submissions

Asia LPG and Naphtha assessments reflect pricing information submitted between 9 a.m. and 6 p.m. Singapore time.

LPG Spot Prices

OPIS assesses daily average spot prices for refrigerated propane, butane, and LPG (11:11) cargoes delivered into Japan and South China, and average prices and cash differentials for Far East propane and LPG (11:11) across three half-month cycles. Far East propane and LPG (11:11) cash differentials are assessed for each half-month cycle against the corresponding same-month Far East swap.

Products and Specifications

- **Propane:** Specifications for refrigerated cargoes align with the prevailing CFR Far East LPG Forward Contract.
- **Butane:** Specifications for refrigerated cargoes align with the prevailing CFR Far East LPG Forward Contract.
- **LPG (11:11):** Specifications for one 11kt tank of refrigerated propane as outlined in the above specifications and one x 11kt tank of refrigerated butane in a VLGC as outlined in the above specifications

Locations

- **CFR Japan:** Delivery to ports in Tokyo Bay, Japan
- **CFR South China:** Delivery to ports in South China
- **Far East Propane:** Delivery to ports in East Asia, including Japan, South Korea and China

Volume

- **Propane:** 22,000-23,000 mt
- **Butane:** 22,000-23,000 mt
- **LPG (11:11):** 11,000-11,500 mt of propane and 11,000-11,500 mt of butane

Timing

- **CFR Japan:** Cargoes delivering 25-40 days forward from the publication date.
- **CFR South China:** Cargoes delivering 25-40 days forward from the publication date.
- **Far East:** Cargoes delivering across three half-month cycles, starting with the cycle month in which the 25th day of the forward delivery window falls.

Roll

- The Far East half-month assessment rolls into the next calendar month when the first day of the 25–40 day forward delivery window enters that month.
- The three half-month cycles are determined sequentially from this point, such that when the first cycle rolls into a new month (e.g., H2 March to H1 April), the second and third cycles roll forward accordingly (to H2 April and H1 May, respectively).

Calculation

- CFR Japan and CFR South China propane, butane, and LPG (11:11) assessments are derived from the time-weighted average of two half-month cycle assessments for cargoes delivering 25–40 days forward.

Pricing Mechanism: US \$/mt

Naphtha Spot Prices

OPIS assesses daily physical prices and cash differentials for open specification naphtha delivered into Japan and South Korea.

Product and Specification

- **Open Spec Naphtha:** Aligns with the prevailing CFR Far East Open Specification Form Naphtha Contract (OSN) with a minimum paraffin content of 65%vol.

Locations

- **CFR Japan:** Delivery into Japan.
- **CFR Korea:** Delivery into South Korea.
- **FOB Singapore:** Loading from Singapore.

Timing

- **CFR Japan:** Cargoes delivering 30–45, 45–60, and 60–75 days forward with assessments published for each half-month cycle. A single CFR Japan assessment is also published as a calculation based on the second and third half-month cycles
- **CFR Korea:** Cargoes delivering 45–75 days forward.
- **FOB Singapore:** First half-month cycle 30-45 days forward

Roll

- The CFR Japan half-month cycles are rolled twice every month -- on the first publication day of the month and the first publication day after the 15th.

Volume

- **CFR Japan:** 25,000 mt
- **CFR Korea:** 25,000 mt
- **FOB Singapore:** 250,000 bbl.

Calculation

- **CFR Japan Naphtha Differentials:** Assessed for cargoes delivering 30-60 days forward.
- **CFR Japan Naphtha:** Calculated as the average of the second and third half-month cycle assessments.

- **CFR Korea Naphtha:** Calculated based on the differential for cargoes delivering into Daesan in relation to the CFR Japan Naphtha assessment.
- **FOB Singapore:** Assessed as a freight netback from the first half-month cycle (30- 45 days) for CFR Japan Naphtha. The freight netback assumes a medium range-size tanker with a port charge of \$0.05/bbl. OPIS applies a 9 bbl to 1 mt conversion factor for this assessment.

Pricing Mechanism: US \$/mt

Europe & Mediterranean

Data Submission

Europe LPG and naphtha assessments reflect pricing data during 4 pm and 4:30 p.m. London time.

LPG Spot Prices

Products and Specifications

- **Propane CIF ARA:** The grade, quality, delivery and nomination terms remain based on the prevailing industry-accepted forward contract, such as the TOT contract. Positions referencing alternative forward delivery contracts may be considered
- **Butane CIF ARA:** Field-grade mixed butane
- **FOB Mediterranean Propane:** Field-grade and refinery-grade propane
- **FOB Mediterranean Butane:** Field-grade and refinery-grade butane

Locations

- **CIF ARA**
 - **Propane:** Delivery into northwest Europe basis Flushing
 - **Butane:** Delivery into northwest Europe basis Amsterdam, Rotterdam and Antwerp (ARA)
- **FOB Mediterranean** Loading basis Lavera

Timing

- **CIF ARA:** Cargoes for delivery 10-25 days forward from date of publication.
- **FOB Mediterranean:** Cargoes loading 5-15 days forward from date of publication.

Roll

- **CIF ARA Propane:** When the 10-25 days forward delivery period crosses two calendar months, OPIS will roll forward the reference month swap considered in its assessment when eight days of the delivery period fall in the second month.

Volume

- **CIF ARA Propane:** 19,400-24,000 mt
- **CIF ARA Butane:** Min 4,000 mt
- **FOB Mediterranean Propane:** Min 1,500 mt
- **FOB Mediterranean Butane:** Min 1,500 mt

Calculation

- **CIF ARA Propane:** Physical bids must have a minimum 5-day delivery date range and offers a maximum 5-day delivery date range entirely within the 10-25 days forward delivery period, basis Flushing. Positions that carry a minimum 50% fixed price component are considered for price discovery. Positions that carry additional restrictive requirements may be excluded.
- **CIF ARA Propane reference month:** Average of swap values transacted for the reference month between 4 p.m. and 4:30 p.m. London time.
- For propane and butane positions that carry a naphtha-related component, the value of propane and butane as a ratio to naphtha will be derived from the naphtha CIF NWE swaps data and close values at 4:30 p.m.

Monthly Contract Price

- **Sonatrach SP:** Monthly propane and butane contract price (SP) as set by Sonatrach for the prevailing month for term cargoes loading FOB in Algeria.
- **North Sea FOB:** Calculated for propane and butane from the average of the last five CIF ARA assessments of the previous calendar month minus freight for a MGC North Sea to ARA set annually.

Pricing Mechanism: US \$/mt

Naphtha Spot Prices

Products and Specifications

- **Naphtha:** Naphtha CIF NWE Cargoes Future reference month
- **Naphtha Open-Spec:** Aligns with the prevailing Open Specification Form Naphtha Contract (OSN) used in Northwest Europe
- **Naphtha Paraffinic:** Paraffinic grade, also known as light virgin naphtha (LVN) with min 80% paraffins content

Location: CIF NWE, delivery into northwest Europe ports basis Rotterdam

Timing: Delivery 10-25 days forward from date of publication

Roll: The reference month considered to calculate the CIF NWE naphtha assessment rolls when eight days of the 10-25 day forward delivery period fall into the second month.

Volume: Cargoes of min. 12,500 mt and max 36,000 mt

Calculation

- The naphtha CIF NWE reference month is calculated from the average of min. 2,000 mt swaps including mini-swaps concluded on an industry-adopted trading platform.
- Differentials for Open-Spec and Paraffinic naphtha grades reflected as premiums or discounts are assessed from market indications and applied to the CIF NWE naphtha reference month to calculate the outright prices.

Pricing Mechanism: US \$/mt, rounded to the nearest 25 cents

OMBD and Delivered LPG Price Assessments

OPIS calculates a daily series of Mont Belvieu Delivered (OMBD) prices for VLGCs and MGCs from Houston to various ports in Asia, Europe and the Mediterranean, Latin America and Africa. The delivered prices incorporate the OPIS Mont Belvieu assessment in addition to the spot terminal fees and the cost of freight. OMBD prices are denoted via the Cape of Good Hope and via the Panama Canal where applicable.

In addition, OPIS calculates LPG delivered prices for voyages from the USEC, Mideast Gulf, WC Canada and Algeria.

Products and Locations

Asia Locations	Products	VLGC Freight Route	
OMBD Japan (VIA PANAMA)	Propane, Butane,	Houston–Chiba	
OMBD Japan (VIA CAPE)	Propane, Butane	Houston–Chiba	
AG-Japan	Propane, Butane	Ras Tanura–Chiba	
WC Canada-Japan	Propane	Prince Rupert–Chiba	
OMBD South China (VIA PANAMA)	Propane, Butane	Houston–Ningbo	
OMBD South China (VIA CAPE)	Propane, Butane	Houston–Ningbo	
OMBD East China (VIA PANAMA)	Propane, Butane	Houston–Yantai	
OMBD East China (VIA CAPE)	Propane, Butane	Houston–Yantai	
OMBD South Korea (VIA PANAMA)	Propane, Butane	Houston–Yeosu	
OMBD South Korea (VIA CAPE)	Propane, Butane	Houston–Yeosu	
OMBD Indonesia (VIA PANAMA)	Propane, Butane	Houston–Tanjung Uban	
OMBD Indonesia (VIA CAPE)	Propane, Butane	Houston–Tanjung Uban	
Middle East-India	LPG (2:2)	Ras Tanura–New Mangalore & Haldia	
OMBD India	LPG (2:2)	Houston–New Mangalore & Haldia	
Europe & Mediterranean Locations	Products	VLGC Freight Route	MGC Freight Route
OMBD Northwest Europe	Propane, Butane	Houston–Flushing	Houston–Flushing
USEC-Northwest Europe	Propane, Butane	Marcus Hook–Flushing	Marcus Hook–Flushing
OMBD West Med	Propane, Butane	Houston–Lavera	
OMBD Turkey	Propane, Butane, LPG (2:2)	Houston–Yarimca	
Algeria-Turkey	Propane, Butane	Arzew–Yarimca	

OMBD Morocco	Propane, Butane	Houston-Mohammedia	Houston–Jorf Lasfar
Latin America Locations	Products	VLGC Freight Route	MGC Freight Route
OMBD Brazil	Propane, Butane	Houston–Suape	
OMBD Caribbean	Propane, Butane	Houston–San Pedro	
OMBD Mexico	Propane	Houston–Pajaritos	Houston–Tuxpan
OMBD Ecuador	Propane, Butane	Houston–Monteverde	
OMBD Peru	Propane		Houston–La Pampilla
OMBD Chile	Propane		Houston–Quintero
Africa Locations	Products	VLGC Freight Route	MGC Freight Route
OMBD Nigeria	Butane		Houston–Lagos
OMBD Cote d'Ivoire	Butane		Houston–Abidjan
OMBD East Africa	Propane, Butane	Houston–Mombasa	

OMBD and Delivered LPG VLGC Freight Rates

The OPIS LPG Time Charter Equivalent Rates for the key routes is used to calculate VLGC freight rates (\$/mt) for specific routes in the calculations of OPIS OMBD and Delivered LPG Prices.

Vessels are assumed to load bunker fuels prior to the laden leg of the round trip, using 0.5% Very Low Sulfur Fuel Oil (VLSFO), and 0.1% Low Sulfur Marine Gasoil (LSMGO) or DMA in sulphur emissions control areas (SECA). LSMGO consumption is also assumed for power auxiliary systems at port. The bunker fuel for the nearest load port or bunker hub is used in the calculation for the desired route given vessels are assumed to have loaded bunker fuels for the laden leg of the voyage.

The freight for specific routes are calculated on a round voyage basis, with the exception of Marcus Hook to Flushing, which assumes a ballast voyage to Houston following discharge at Flushing.

All freight rates for OPIS LPG Delivered Prices specify which canal is involved in the routing where relevant.

Port costs and timings are reviewed on an annual basis.

Calculations

- **VLGC TCE (\$/day)** = ((OPIS VLGC Spot Freight Rate x Cargo Size) – Costs)/Voyage Duration.
- **Houston–India TCE:** Basis Houston - Chiba, using the voyage parameters and misc. costs of the voyage, the time charter equivalent (TCE) rate is calculated from a derived Houston-India spot \$/mt rate. This spot rate assumes a fixed 2.5% premium on the \$/mt daily assessment.
- **Houston–New Mangalore & Haldia TCE:** Routes assume laden and ballast of the voyage via the Cape of Good Hope.

OMBD and Delivered LPG VLGC Freight Rates Specifications

VLGC Specifications			Value
Deadweight tonnage (DWT)			55,000
Gross tonnage (GT)			49,000
Net register tonnage (NRT)			17,000
Length (m)			226
Beam (m)			37
Laden/Ballast speeds (knots)			15
Laden/Ballast VLSFO fuel consumption (mt/day)			38
Port VLSFO fuel consumption (mt/day)			10
Laden/Ballast LSMGO fuel consumption (mt/day)			0.2
Port LSMGO fuel consumption (mt/day)			0.25
VLGC Derived Routes			Base Rate
Houston-Ningbo			Houston-Chiba
Houston-Yantai			Houston-Chiba
Houston-Yeosu			Houston-Chiba
Houston-Tanjung Uban			Houston-Chiba
Houston-Monteverde			Houston-Chiba
Prince Rupert-Chiba			Ras Tanura-Chiba
Houston-San Pedro			Houston-Flushing
Houston-Suape			Houston-Flushing
Houston-Mohammedia			Houston-Flushing
Houston-Lavera			Houston-Flushing
Marcus Hook-Flushing			Houston-Flushing
Houston-Mombasa			Houston-Flushing
Houston-Yarimca			Houston-Flushing
Arzew-Yarimca			Houston-Flushing
Houston-Pajaritos			Houston-Flushing
Ras Tanura-New Mangalore & Haldia			Ras Tanura-India basis Ras Tanura-Chiba
Houston-New Mangalore & Haldia			Houston-India
VLGC Port		Cost	Timing
Ras Tanura		\$12,000	2 days loading

Chiba	\$75,000	2 days discharge
Houston	\$45,000	2 days loading
Flushing	\$85,000	2 days discharge
Ningbo	\$40,000	2 days discharge
Yantai	\$34,500	2 days discharge
Yeosu	\$50,750	2 days discharge
Tanjung Uban	\$35,000	3 days discharge
Prince Rupert	\$45,000	2 days discharge
San Pedro	\$48,000	2 days discharge
Suape	\$85,000	2 days discharge
Mohammedia	\$120,000	2 days discharge
Lavera	\$80,000	2 days discharge
Marcus Hook	\$50,000	2 days loading
Mombasa	\$47,000	10 days discharge
Yarimca	\$65,000	10 days discharge
Arzew	\$60,000	2 days loading
New Mangalore	\$85,000	3 days discharge
Haldia	\$95,000	4 days discharge
Pajaritos	\$51,575	2 days discharge
Monteverde	\$200,650	2 days discharge

OMBD and Delivered LPG MGC Freight Rates

OPIS assesses an Average price for 12-month Time Charter Rates for Midsize Gas Carriers (MGC) each week on Monday, which represent the price to fix a vessel from the previous week. This timecharter rate is then used to calculate daily \$/mt equivalent MGC rates for OMBD and Delivered LPG Prices on specific routes.

The day rate for an MGC includes bunker fuel and port costs. All routes are assumed to be a round voyage with a 98% cargo load. The cargo is noted as metric tons.

Vessels are assumed to load bunker fuels prior to the laden leg of the round trip, using 0.5% Very Low Sulfur Fuel Oil (VLSFO), and 0.1% Low Sulfur Marine Gasoil (LSMGO) or DMA in sulphur emissions control areas (SECA). LSMGO consumption is also assumed for power auxiliary systems at port. The bunker fuel for the nearest load port or bunker hub is used in the calculation for the desired route given vessels are assumed to have loaded bunker fuels for the laden leg of the voyage.

The freight for specific routes are calculated on a round voyage basis, with the exception of Marcus Hook to Flushing, which assumes a ballast voyage to Houston following discharge at Flushing. All freight rates for OPIS LPG Delivered Prices specify which canal is involved in the routing where relevant.

All routes assume 6 hours Notice of Readiness per port and 12 hours bunkering per round voyage. Port costs and timings are reviewed on an annual basis, including Panama Canal fees for voyages to La Pampilla and Quintero.

OMBD and Delivered LPG MGC Calculations

- **Houston–Lagos:** Includes a cost of \$75,000 for armed guards during the vessel's discharge in Lagos and for one day either side. It does not include port costs at Lagos, which are for the charterer's account.
- The \$/month assessment is rounded to the nearest \$5,000/mt.

OMBD and Delivered LPG MGC Freight Rates Specifications

38,000 cbm MGC Specifications		Value
Deadweight tonnage (DWT)		28,000
Gross tonnage (GT)		25,000
Net register tonnage (NRT)		7,500
Length (m)		175
Beam (m)		28
Laden/Ballast speeds (knots)		15
Laden VLSFO fuel consumption (mt/day)		29
Ballast VLSFO fuel consumption (mt/day)		27
Port VLSFO fuel consumption (mt/day)		4
Laden/Ballast LSMGO fuel consumption (mt/day)		0.1
Port LSMGO fuel consumption (mt/day)		0.1
38,000 cbm MGC Derived Route	Cargo Type	Volume (mt)
Houston–Tuxpan	Propane	21,700
Houston–Jorf Jasfar	Propane	21,700
Houston–Flushing	Propane	21,700
Marcus Hook–Flushing	Propane	21,700
Houston–La Pampilla	Propane	21,700
Houston–Quintero	Propane	21,700
Houston–Jorf Lasfar	Butane	22,300
Houston–Flushing	Butane	22,300

Marcus Hook–Flushing	Butane	22,300
Houston–Lagos	Butane	22,300
Houston–Abidjan	Butane	22,300
40,000 cbm MGC Specifications	Value	
Deadweight Tonnage (DWT)	28,500	
Gross Tonnage (GT)	26,250	
Net Register Tonnage (NRT)	7,750	
Length (m)	180	
Beam (m)	29	
Laden/Ballast Speeds (knots)	15	
Laden Bunker Fuel Consumption (mt/day)	29	
Ballast Bunker Fuel Consumption (mt/day)	27	
Bunker Fuel Consumption in Port (mt/day)	4	
Laden LSMGO Consumption (mt/day)	0.1	
Ballast LSMGO Consumption (mt/day)	0.1	
Port LSMGO Consumption (mt/day)	0.1	
40,000 cbm MGC Derived Routes	Cargo Type	Volume (mt)
Houston–Tuxpan	Propane	22,800
Houston–Jorf Jasfar	Propane	22,800
Houston–Flushing	Propane	22,800
Marcus Hook–Flushing	Propane	22,800
Houston–La Pampilla	Propane	22,800
Houston–Quintero	Propane	22,800
Houston–Jorf Lasfar	Butane	23,500
Houston–Flushing	Butane	23,500
Marcus Hook–Flushing	Butane	23,500
Houston–Lagos	Butane	23,500
Houston–Abidjan	Butane	23,500
MGC Port	Cost	Timing
Houston	\$26,000	1 day loading
Marcus Hook	\$35,600	1 day loading

Jorf Lasfar	\$34,000	1.5 days discharge
Flushing	\$45,000	1 day discharge
Tuxpan	\$53,000	1 day discharge
Lagos	N/A	4 days discharge
Abidjan	\$102,000	9 days discharge
La Pampilla	\$40,000	1 day discharge
Quintero	\$109,000	1 day discharge

Pricing Mechanism: US \$/mt

Global Forward Curves

OPIS aggregates London close-of-business swap data from broker reports to derive its Forward Curves.

Data Submission

The Global LPG Forward Curves reflect pricing information collected before 7 p.m. London time.

Products

- Belv Propane
- Belv Butane
- NWE Propane
- NWE Pro/Nap
- NWE Naphtha
- Propane Arb
- Propane CP
- Butane CP
- FE Propane
- Propane E/W
- Belv/FE Propane
- East Naphtha
- Naphtha E/W

Timing

- 13 months forward with balance month as first month
- 5 quarters forward with balance quarter as first quarter
- 2 calendars forward with balance calendar as first calendar

Daily Pricing Mechanism: US \$/mt