Platts
S&P Global
Commodity Insights

Specifications Guide

Carbon Intensity and Low Carbon Markets

Latest update: August 2025

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Definitions of the trading locations for which Platts publishes daily indexes or assessments

The following specifications guide contains the primary specifications for Platts Low Carbon Gas, and Carbon Intensity price assessments. All the assessments listed here employ Platts Assessments Methodology, as published at https://www.spglobal.com/platts/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/platts-assessments-methodology-guide.pdf.

This guide is designed to give Platts subscribers as much information as possible about a wide range of methodology and specification questions.

This guide is current at the time of publication. Platts may issue further updates and enhancements to this guide and will announce these to subscribers through its usual publications of record. Such updates will be included in the next version of this guide. Platts editorial staff and managers are available to provide guidance when assessment issues require clarification.

Platts Carbon Intensity price assessment specifications

The energy landscape is set to change dramatically over the coming years as companies may seek to curb greenhouse gas (GHG) emissions from fossil fuels to meet net-zero ambitions by 2050.

Measuring the carbon intensity of different commodities is one way the market has started to measure GHG emissions from various production types. In the case of crude oil, carbon intensity is used to measure the volume of GHG emissions to be offset; however, it could be considered an additional attribute, similar to API, sulfur or TAN. In the case of refined products, carbon intensity is critical in measuring Scope 2 and Scope 3 emissions.

Both the Crude Carbon Intensity and the Refined Products Carbon Intensity assessments published by S&P Global Commodity Insights analytics measure the amount of carbon dioxide equivalent emitted per unit of oil. This is then used to calculate a Carbon Intensity Premium, using the daily Platts Carbon Removal Credit Assessment (Platts CRC, ACRCA00). This calculation is published to three decimal places. The Platts CRC assessment reflects the price of carbon credits from projects that result in the removal of existing GHG emissions from the atmosphere and include credits from both the Natural Carbon Capture and Technological Carbon Capture categories.

To learn more about the Platts CRC assessment please visit: https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/method_carbon_credits.pdf.

All Carbon Intensity monthly assessments published by S&P Global Commodity Insights analytics are updated on the 15th of every month as of November 2024. In the event that the 15th falls on a non-working day, then they will be updated on the previous working day.

Crude Oil

S&P Global Commodity Insights analytics' Upstream Crude Carbon Intensity calculations measure the impact of GHG emissions in the lifecycle from production to storage. For example, S&P Global Commodity Insights analytics' Upstream Carbon Intensity Assessments for US Permian Basin crude include the measurement of carbon intensity from well-head, including venting/flaring, through pipeline and into the storage terminal on the Gulf Coast. S&P Global Commodity Insights analytics does not include any Scope 1 or Scope 2 emissions from activities that happened prior to today – i.e. S&P Global Commodity Insights analytics is calculating today's emissions to deliver today's barrel.

When calculating the upstream carbon intensity, S&P Global Commodity Insights analytics has taken a bottom-up approach and is looking at the production-to-storage terminal segment of the lifecycle. Emissions during the exploration and drilling stages are unaccounted for. Results are generated using the Oil Production Greenhouse Gas Emissions Estimator (OPGEE) 2.0 model, combined with proprietary research and data from S&P Global Commodity Insights' analytics team.

S&P Global Commodity Insights analytics will update the monthly upstream carbon intensity calculation, which feeds into the Crude Carbon Intensity Premiums, on the 15th of each month as of November 2024. If the 15th falls on a non-working day, the carbon intensity will be updated the next working day.

In addition to crude fields, S&P Global Commodity Insights analytics calculates the upstream carbon intensity for crude grades based on a volume-weighted average of the carbon intensity of the fields that go into that specific grade. Please find crude grades below and corresponding fields that go into the calculation of the carbon intensity:

WTI Midland: Permian Midland and Delaware

Troll: Fram and Troll

Oseberg: Oseberg and Brage

Ekofisk: Auk, Clyde, Ekofisk, Embla, Fulmar, Gannet, Janice, Joanne, Judy and Ula

Forties: Buzzard, Forties, Brae, Miller, Arbroath, Balmoral, Scott, Nelson, Everest, Brae East, Bruce, Tiffany, and Toni

Brent: Brent, Cormorant, Hutton, Thistle, Murchison, Dunlin, Ninian, Alwyn North, and Magnus.

Dubai: Fateh, Falah, and Rashid

Oman: Oman

Al-Shaheen: Al-Shaheen

Upper Zakum: Upper Zakum

Das Blend: Lower Zakum, Umm Shaif, Nasr, El Bunduq, Abu Al Bukhoosh

Arab Light: Ghawar, Khurais, Abu Hadriya

Saharan Blend: Hassi Messaoud

Murban: Murban

Medanito: El Medanito

Canadon Seco: Canadon Seco

Escalante: Escalante

Tupi: Tupi

Jubarte: Jubarte

Roncador Heavy: Roncador

Vasconia: Cusiana, Cupiagua

Rubiales: Rubiales

Castilla Blend: Castilla

Cuban Heavy: Varadero

Oriente: Shushufindi-Aguarico, Cuyabeno

Napo: Jivino-Napo, Ishpingo, Sacha

Liza: Liza 1

Payara: Payara

Unity Gold: Liza 2

Olmeca: Xux, Tsimin

Istmo: Abkatun, Chuc, Pol

Maya: Cantarell

Galeota Mix: Galeota (Trintes)

Merey 16: Orinoco Belt. Santa Barbara

Alaskan North Slope: Kuparuk-River, Schrader Bluff, Prudhoe-Bay

Eagle Ford: Eagle Ford

Bakken: Bakken

West Texas Intermediate (MEH): Gulf Coast Louisiana

West Texas Intermediate (Cushing): SCOOP-STACK

Wyoming Sweet: Powder River

Mixed Sweet Blend: Cardium Shale, Bakken-Canada, Viking Shale

Agbami-Ekoli: Agbami

Al Jurf: Al Jurf

Arab Heavy: Manifa, Safaniya

Arab Medium: Zuluf, Abu Safah, Marjan

Arab XL: Abqai, Berri

Arabian Super Light: Hawtah, Shaybah

Azeri Light: Azeri-Chirag-Guneshli

Basrah Heavy: Gharraf, Halfaya, Qurna West

Basrah Light: Zubair, Rumaila, Qurna West

Bonga: Bonga North West Field, Bonga

Bozhong: Bozhong BZ13-1, BZ19-4, BZ25-1, BZ25-1S, BZ26-2, BZ26-3, BZ28-1, BZ28-2, BZ28-2S, BZ29-4, BZ34-1, BZ34-1N, BZ34-2, BZ34-4, BZ34-7, BZ34-9

CPC Blend: Karachaganak, Kashagan, Tengiz

Cusiana: Cusiana, Cupiagua

El Sharara: El Hamra, El Sharara A, El Sharara N, NC186-A, NC186-B, NC186-D, NC186-H, NC186-I, NC186-K

Es Sider: Dahra, Samah, Waha

Foroozan: Aboozar, Marjan

Hebron: Hebron

Hibernia: Hibernia

Iranian Heavy: Ahwaz, Gachasaran, Marun

Iranian Light: Aghajari, Karanj, Ahwaz

Kirkuk: Bai Hassan, Jambur, Khabbaz, Kirkuk

Kuwait: Greater Burgan, Raudhatain, Sabriya, Umm Gudair

Mars: Mars-Ursa

Poseidon: Hadrian North, Heidelberg, Buckskin, Knotty Head (Stampede), Lucius, K2, Shenzi

ESPO: Srednebotuobinskoe, Talakanskoye, Verkhnechonskoye, Vankorskoye, Messoyakhskoye Vostochnoye

Thunder Horse: Thunder Horse, Thunder Horse North, Appomattox

Ural: Romashkinskoye, Samotlor, Priobskoye, Fedorovskoye, Prirazlomnoye (Khanty-Mansiysk)

S&P Global Commodity Insights analytics Midstream Carbon Intensity calculation measures the impact of GHG emissions using different freight, rail, or pipeline routes to major demand destinations. For a specific crude, observing the upstream carbon intensity and then looking at the freight/pipeline route to the refinery will provide an all-in carbon intensity up to the refinery-gate.

When calculating the midstream carbon intensity, S&P Global Commodity Insights analytics has chosen one major route, taking crude from each field, and each grade, to its most typical refinery gate.

S&P Global Commodity Insights analytics will periodically review the Midstream Carbon Intensity Calculations and will update them as needed.

Below are the assumptions that S&P Global Commodity Insights analytics has taken into consideration when calculating the midstream carbon intensity for each field, and by shipping route.

Crude Grade Upstream carbon intensity symbols

Crude Grade	Upstream CI KgC02e/bbl	Upstream CI gC02e/MJ	Upstream CI Premium $/bbl	Currency	UOM
Bates	u	c	c		
WTI Midland	WXTIC40	WXTIC41	WXTIC00	USD	CBL
Troll	TXROC40	TXROC41	TXROC00	USD	CBL
Oseberg	OXSEC40	OXSEC41	OXSEC00	USD	CBL
Ekofisk	EXKOC40	EXKOC41	EXKOC00	USD	CBL
Forties	FXORC40	FXORC41	FXORC00	USD	CBL
Brent	BXREC40	BXREC41	BXREC00	USD	CBL
Dubai	AGINI40	AGINI41	AGINA00	USD	CBL
Oman	AGINJ40	AGINJ41	AGINB00	USD	CBL
Al-Shaheen	AGINK40	AGINK41	AGINC00	USD	CBL
Upper Zakum	AGINL40	AGINL41	AGIND00	USD	CBL
Das Blend	AGINM40	AGINM41	AGINE00	USD	CBL
Arab Light	AGINN40	AGINN41	AGINF00	USD	CBL
Saharan Blend	AGINO40	AGINO41	AGING00	USD	CBL
Murban	AGINP40	AGINP41	AGINH00	USD	CBL
Canadon Seco	AMGLU40	AMGLU41	AMGLB00	USD	CBL
Castilla Blend	AMGLH40	AMGLH41	AMGLH00	USD	CBL
Cuban Heavy	AMGMB40	AMGMB41	AMGLI00	USD	CBL
Escalante	AMGLV40	AMGLV41	AMGLC00	USD	CBL
Galeota Mix	AMGMK40	AMGMK41	AMGLR00	USD	CBL
Istmo	AMGMI40	AMGMI41	AMGLP00	USD	CBL
Jubarte	AMGLW40	AMGLW41	AMGLD00	USD	CBL
Liza	AMGME40	AMGME41	AMGLL00	USD	CBL
Maya	AMGMJ40	AMGMJ41	AMGLQ00	USD	CBL
Medanito	AMGLT40	AMGLT41	AMGLA00	USD	CBL
Merey 16	AMGML40	AMGML41	AMGLS00	USD	CBL
Napo	AMGMD40	AMGMD41	AMGLK00	USD	CBL
Olmeca	AMGMH40	AMGMH41	AMGLO00	USD	CBL
Oriente	AMGMC40	AMGMC41	AMGLJ00	USD	CBL
Payara	AMGMF40	AMGMF41	AMGLM00	USD	CBL
Roncador Heavy	AMGLX40	AMGLX41	AMGLE00	USD	CBL
Rubiales	AMGLZ40	AMGLZ41	AMGLG00	USD	CBL
Tupi	AMGLI40	AMGLI41	AMGRY00	USD	CBL
Unity Gold	AMGMG40	AMGMG41	AMGLN00	USD	CBL
Vasconia	AMGLY40	AMGLY41	AMGLF00	USD	CBL
Alaskan North Slope	AMGRH40	AMGRH41	AMGRA00	USD	CBL
Bakken	AMGRJ40	AMGRJ41	AMGRC00	USD	CBL
Eagle Ford	AMGRI40	AMGRI41	AMGRB00	USD	CBL
Mixed Sweet Blend	AMGRN40	AMGRN41	AMGRG00	USD	CBL

Crude Grade Upstream carbon intensity symbols

Crude Grade	Upstream CI KgC02e/bbl	Upstream CI gC02e/MJ	Upstream CI Premium $/bbl	Currency	UOM
Bates	u	c	c		
West Texas Intermediate (Cushing)	AMGRL40	AMGRL41	AMGRE00	USD	CBL
West Texas Intermediate (MEH)	AMGRK40	AMGRK41	AMGRD00	USD	CBL
Wyoming Sweet	AMGRM40	AMGRM41	AMGRF00	USD	CBL
Agbami-Ekoli	ACOGY00	ACOFX00	N/A	N/A	N/A
Al Jurf	ACOGL00	ACOFK00	N/A	N/A	N/A
Arab Heavy	ACOGP00	ACOFO00	N/A	N/A	N/A
Arab Medium	ACOGO00	ACOFN00	N/A	N/A	N/A
Arab XL	ACOGM00	ACOFL00	N/A	N/A	N/A
Arabian Super Light	ACOGN00	ACOFM00	N/A	N/A	N/A
Azeri Light	ACOHB00	ACOGA00	N/A	N/A	N/A
Basrah Heavy	ACOGE00	ACOFD00	N/A	N/A	N/A
Basrah Light	ACOGG00	ACOFF00	N/A	N/A	N/A
Bonga	ACOGZ00	ACOFY00	N/A	N/A	N/A
Bozhong	ACOHA00	ACOFZ00	N/A	N/A	N/A
CPC Blend	ACOGH00	ACOFG00	N/A	N/A	N/A
Cusiana	ACOGX00	ACOFW00	N/A	N/A	N/A
El Sharara	ACOGJ00	ACOFI00	N/A	N/A	N/A
Es Sider	ACOGK00	ACOFJ00	N/A	N/A	N/A
ESPO	ACOGQ00	ACOFP00	N/A	N/A	N/A
Foroozan	ACOGD00	ACOFC00	N/A	N/A	N/A
Hebron	ACOGV00	ACOFU00	N/A	N/A	N/A
Hibernia	ACOGW00	ACOFV00	N/A	N/A	N/A
Iranian Heavy	ACOGB00	ACOFA00	N/A	N/A	N/A
Iranian Light	ACOGC00	ACOFB00	N/A	N/A	N/A
Kirkuk	ACOGF00	ACOFE00	N/A	N/A	N/A
Kuwait	ACOGI00	ACOFH00	N/A	N/A	N/A
Mars	ACOGS00	ACOFR00	N/A	N/A	N/A
Poseidon	ACOGU00	ACOFT00	N/A	N/A	N/A
Thunder Horse	ACOGT00	ACOFS00	N/A	N/A	N/A
Ural	ACOGR00	ACOFQ00	N/A	N/A	N/A

Crude Upstream and Midstream carbon intensity symbols

Crude Field	Upstream CI KgC02e/boe	Upstream CI Premium $/boe	Transport Route	Transport CI KgC02e/bbl	Transport CI Premium $/bbl	Currency	UOM
Bates:	U	c		u	c		
Alpine	ALPIC40	ALPIC00	Alaska to West Coast	ALPIC50	ALPIC10	USD	CBL
Alvheim	ALVHC40	ALVHC00	Alvheim to Havre	ALVHC50	ALVHC10	USD	CBL
Anadarko	ANADC40	ANADC00	Oklahoma to Gulfcoast	ANADC50	ANADC10	USD	CBL
Appomattox	APPOC40	APPOC00	Appomattox to Changxing	APPOC50	APPOC10	USD	CBL
Atlantis	ATLAC40	ATLAC00	Atlantis to Qingdao	ATLAC50	ATLAC10	USD	CBL
Auger	AUGEC40	AUGEC00	Auger to Qingdao	AUGEC50	AUGEC10	USD	CBL
Bakken	BAKNC40	BAKNC00	Beaumont to Rotterdam	BAKNC50	BAKNC10	USD	CBL
Bakken-Canada	BAKKC40	BAKKC00	Canada to Midwest	BAKKC50	BAKKC10	USD	CBL
Big-Foot	BIGMC40	BIGMC00	Bigfoot to Daesan	BIGCC50	BIGCC10	USD	CBL
Buzzard	BZRDC40	BZRDC00	Houndpoint to Rotterdam	BZRDC50	BZRDC10	USD	CBL
CA-Coast	CAMCC40	CAMCC00	Kern to SoCal	CAMCC50	CAMCC10	USD	CBL
Cantarell	CNTLC40	CNTLC00	Cantarell to Bilbao	CNTLC50	CNTLC10	USD	CBL
Captain	CAPTC40	CAPTC00	Captain to Hamburg	CAPTC50	CAPTC10	USD	CBL
Cardium Shale	CARDC40	CARDC00	Cardium to Canada	CARDC50	CARDC10	USD	CBL
Catcher	CATCC40	CATCC00	Catcher to Rotterdam	CATCC50	CATCC10	USD	CBL
Chinook	CHINC40	CHINC00	Chinook to Changxing	CHINC50	CHINC10	USD	CBL
Clair	CLAIC40	CLAIC00	Claire to Stanlow	CLAIC50	CLAIC10	USD	CBL
Cold-Lake	CDLKC40	CDLKC00	Canada - US Midwest	CDLKC50	CDLKC10	USD	CBL
CVE Christina Lake	CVECC40	CVECC00	Canada to Midwest	CVECC50	CVECC10	USD	CBL
Denver-Julesburg	DENVC40	DENVC00	Denver to Gulfcoast	DENVC50	DENVC10	USD	CBL
Devils-Tower	DEVIC40	DEVIC00	Devils to Daesan	DEVIC50	DEVIC10	USD	CBL
Eagle Ford	EGFDC40	EGFDC00	Houston to Qingdao	EGFDC50	EGFDC10	USD	CBL
Edvard-Grieg	EDVAC40	EDVAC00	Edvard-Grieg to Sarroch	EDVAC50	EDVAC10	USD	CBL
Ekofisk	EKFSC40	EKFSC00	Teesside to Rotterdam	EKFSC50	EKFSC10	USD	CBL
Europa	EUROC40	EUROC00	Europa to Daesan	EUROC50	EUROC10	USD	CBL
Firebag	FIREC40	FIREC00	Canada to Midwest	FIREC50	FIREC10	USD	CBL
Foster Creek	FOSTC40	FOSTC00	Canada to Gulfcoast	FOSTC50	FOSTC10	USD	CBL
Ghawar	GHWRC40	GHWRC00	Ras Tanura to Qingdao	GHWRC50	GHWRC10	USD	CBL
Girassol	GRSLC40	GRSLC00	Girassol to Qingdao	GRSLC50	GRSLC10	USD	CBL
Golden-Eagle	GOLDC40	GOLDC00	Golden-Eagle to Grangemouth	GOLDC50	GOLDC10	USD	CBL
Goliat	GOLIC40	GOLIC00	Goliat to Rotterdam	GOLIC50	GOLIC10	USD	CBL
Grane	GRANC40	GRANC00	Sture to Immingham	GRANC50	GRANC10	USD	CBL
Great-White	GREAC40	GREAC00	Great-White to Changxing	GREAC50	GREAC10	USD	CBL
Gulf-Coast-Louisiana	GULFC40	GULFC00	Lousiana to Texas	GULFC50	GULFC10	USD	CBL
Gullfaks	GULLC40	GULLC00	Gullfaks to Brofjorden	GULLC50	GULLC10	USD	CBL
Hebron	HEBRC40	HEBRC00	Hebron to Canada	HEBRC50	HEBRC10	USD	CBL
Heidrun	HEIDC40	HEIDC00	Heidrun to Rotterdam	HEIDC50	HEIDC10	USD	CBL
Hibernia	HIBEC40	HIBEC00	Hibernia to Canada	HIBEC50	HIBEC10	USD	CBL
Horn-Mountain	HORNC40	HORNC00	Horn-Mountain to Qingdao	HORNC50	HORNC10	USD	CBL

Crude Upstream and Midstream carbon intensity symbols

Crude Field	Upstream CI KgC02e/boe	Upstream CI Premium $/boe	Transport Route	Transport CI KgC02e/bbl	Transport CI Premium $/bbl	Currency	UOM
Bates:	U	c		u	c		
Ivar-Aasen	IVARC40	IVARC00	Ivar-Aasen to Rotterdam	IVARC50	IVARC10	USD	CBL
Jack	JAKKC40	JAKKC00	Jack to Qingdao	JAKKC50	JAKKC10	USD	CBL
Jackfish	JACKC40	JACKC00	Canada to Midwest	JACKC50	JACKC10	USD	CBL
John Sverdrup	JSVRC40	JSVRC00	Mongstad to Rotterdam	JSVRC50	JSVRC10	USD	CBL
Julia	JULIC40	JULIC00	Julia to Daesan	JULIC50	JULIC10	USD	CBL
Kirby Lake	KIRBC40	KIRBC00	Canada to Midwest	KIRBC50	KIRBC10	USD	CBL
Kirkuk	KIRKC40	KIRKC00	Ceyhan to Rotterdam	KIRKC50	KIRKC10	USD	CBL
Kraken	KRAKC40	KRAKC00	Kraken to Rotterdam	KRAKC50	KRAKC10	USD	CBL
Kuparuk-River	KUPAC40	KUPAC00	Alaska to US West Coast	KUPAC50	KUPAC10	USD	CBL
Leo	LEOMC40	LEOMC00	Leo to Daesan Coast	LEOCC50	LEOCC10	USD	CBL
Long Lake	LONGC40	LONGC00	Canada to Midwest	LONGC50	LONGC10	USD	CBL
Lucius	LUCSC40	LUCSC00	Lucius to Qingdao	LUCSC50	LUCSC10	USD	CBL
MacKay River	MCKAC40	MCKAC00	Canada to Rockies	MCKAC50	MCKAC10	USD	CBL
Mad-Dog	MADAC40	MADAC00	Mad-Dog to Changxing	MADAC50	MADAC10	USD	CBL
Mariner	MARIC40	MARIC00	Mariner to Pascagoula	MARIC50	MARIC10	USD	CBL
Mars-Ursa	MRURC40	MRURC00	Mars to Qingdao	MRURC50	MRURC10	USD	CBL
MEG Christina Lake	MEGCC40	MEGCC00	Canada to Gulfcoast	MEGCC50	MEGCC10	USD	CBL
Montney Shale	MONTC40	MONTC00	Montney to to	MONTC50	MONTC10	USD	CBL
Oseberg	OSEBC40	OSEBC00	Sture to Rotterdam	OSEBC50	OSEBC10	USD	CBL
Permian-Delaware	PRDLC40	PRDLC00	Corpus Christi to Rotterdam	PRDLC50	PRDLC10	USD	CBL
Permian-Midland	PRMDC40	PRMDC00	Corpus Christi to Rotterdam	PRMDC50	PRMDC10	USD	CBL
Permian-Other	PERMC40	PERMC00	Corpus to Qingdao	PERMC50	PERMC10	USD	CBL
Powder-River	POWDC40	POWDC00	Wyoming to Gulfcoast	POWDC50	POWDC10	USD	CBL
Primrose/Wolf Lake	PRMWC40	PRMWC00	Canada to Midwest	PRMWC50	PRMWC10	USD	CBL
Prudhoe-Bay	PRUDC40	PRUDC00	Alaska to West Coast	PRUDC50	PRUDC10	USD	CBL
Salina	SALIC40	SALIC00	Kansas to Gulfcoast	SALIC50	SALIC10	USD	CBL
San-Joaquin	SANMC40	SANMC00	San-Joaquin to Socal	SANAC50	SANAC10	USD	CBL
Schiehallion	SCHIC40	SCHIC00	Schiellhallion to Rotterdam	SCHIC50	SCHIC10	USD	CBL
Schrader-Bluff	SCHRC40	SCHRC00	Alaska to US West Coast	SCHRC50	SCHRC10	USD	CBL
SCOOP-STACK	SCOOC40	SCOOC00	Oklahoma to Gulfcoast	SCOOC50	SCOOC10	USD	CBL
Shenzi	SHENC40	SHENC00	Shenzi to Daesan	SHENC50	SHENC10	USD	CBL
Snorre	SNORC40	SNORC00	Snorre to Statfjord	SNORC50	SNORC10	USD	CBL
Statfjord	STATC40	STATC00	Statfjord to Rotterdam	STATC50	STATC10	USD	CBL
Stones	STONC40	STONC00	Stones to Daesan	STONC50	STONC10	USD	CBL
Sunrise	SUNRC40	SUNRC00	Canada to Midwest	SUNRC50	SUNRC10	USD	CBL
Surmont	SURMC40	SURMC00	Canada to Gulfcoast	SURMC50	SURMC10	USD	CBL
Tahiti	TAHIC40	TAHIC00	Tahiti to Yeosu	TAHIC50	TAHIC10	USD	CBL
Tengiz	TNGZC40	TNGZC00	Novo to Rotterdam	TNGZC50	TNGZC10	USD	CBL
Thunder-Horse	THUNC40	THUNC00	Thunder-Horse to Qingdao	THUNC50	THUNC10	USD	CBL

Crude Upstream and Midstream carbon intensity symbols

Crude Field	Upstream CI KgC02e/boe	Upstream CI Premium $/boe	Transport Route	Transport CI KgC02e/bbl	Transport CI Premium $/bbl	Currency	UOM
Bates:	U	c		u	c		
Troll	TROLC40	TROLC00	Mongstad to Rotterdam	TROLC50	TROLC10	USD	CBL
Tupi	TUPIC40	TUPIC00	Rio to Qingdao CI	TUPIC50	TUPIC10	USD	CBL
Uinta	UINTC40	UINTC00	Northeast to Gulfcoast	UINTC50	UINTC10	USD	CBL
Utica	UTICC40	UTICC00	Northeast to Gulfcoast	UTICC50	UTICC10	USD	CBL
Valhall	VALHC40	VALHC00	Valhall to Rotterdam	VALHC50	VALHC10	USD	CBL
Viking Shale	VIKIC40	VIKIC00	Canada to Midwest	VIKIC50	VIKIC10	USD	CBL
Agbami	AGBAC40	AGBAC00	Agbami to Paradip	AGBAC50	AGBAC10	USD	CBL
Azeri	AZERC40	AZERC00	Ceyhan to Sarroch	AZERC50	AZERC10	USD	CBL
Bombay High	MUMBC40	MUMBC00	Bombay High to Qingdao	MUMBC50	MUMBC10	USD	CBL
Bonga	BONGC40	BONGC00	Bonga to Rotterdam	BONGC50	BONGC10	USD	CBL
Bozhong	BOZHC40	BOZHC00	Bohai Pengbo to Singapore	BOZHC50	BOZHC10	USD	CBL
Burgan	BURGC40	BURGC00	Mina to Ulsan	BURGC50	BURGC10	USD	CBL
Cusiana	CUSIC40	CUSIC00	Tolu to Houston	CUSIC50	CUSIC10	USD	CBL
Dukhan	DUKHC40	DUKHC00	Mesaieed to Singapore	DUKHC50	DUKHC10	USD	CBL
Fateh	FATEC40	FATEC00	Fateh to Kiire	FATEC50	FATEC10	USD	CBL
Marun	MARUC40	MARUC00	Kharg Island to Qingdao	MARUC50	MARUC10	USD	CBL
Murban	MURBC40	MURBC00	Fujairah to Chiba	MURBC50	MURBC10	USD	CBL
Orinoco Oil Belt	ORINC40	ORINC00	Jose to Sikka	ORINC50	ORINC10	USD	CBL
Rumaila	RUMAC40	RUMAC00	Al Basrah to Sikka	RUMAC50	RUMAC10	USD	CBL
Sacha	SACHC40	SACHC00	Esmeraldas to Long Beach	SACHC50	SACHC10	USD	CBL
Safaniya	SAFAC40	SAFAC00	Ras Tanura to Changxing	SAFAC50	SAFAC10	USD	CBL
Samotlor	SAMOC40	SAMOC00	Primorsk to Rotterdam	SAMOC50	SAMOC10	USD	CBL
Waha	WAHAC40	WAHAC00	Zawia to Augusta	WAHAC50	WAHAC10	USD	CBL
West Qurna	WESTC40	WESTC00	Al Basrah to Sikka	WESTC50	WESTC10	USD	CBL
Zubair	ZUBAC40	ZUBAC00	Al Basrah to Sikka	ZUBAC50	ZUBAC10	USD	CBL
Zuluf	ZULUC40	ZULUC00	Ras Tanura to Changxing	ZULUC50	ZULUC10	USD	CBL
Alwyn North	ALWYC40	ALWYC00	Sullom Voe to Rotterdam	ALWYC50	ALWYC10	USD	CBL
Arbroath	ARBRC40	ARBRC00	Houndpoint to Rotterdam	ARBRC50	ARBRC10	USD	CBL
Auk	AUKCC40	AUKCD00	Teeside to Rotterdam	AUKCC50	AUKCC10	USD	CBL
Brae	BRAEC40	BRAEC00	Houndpoint to Rotterdam	BRAEC50	BRAEC10	USD	CBL
Brage	BRAGC40	BRAGC00	Sture to Brofjorden	BRAGC50	BRAGC10	USD	CBL
Bruce	BRUCC40	BRUCC00	Houndpoint to Rotterdam	BRUCC50	BRUCC10	USD	CBL
Clyde	CLYDC40	CLYDC00	Teeside to Rotterdam	CLYDC50	CLYDC10	USD	CBL
Cormorant	CORMC40	CORMC00	Sullom Voe to Rotterdam	CORMC50	CORMC10	USD	CBL
Embla	EMBLC40	EMBLC00	Teeside to Rotterdam	EMBLC50	EMBLC10	USD	CBL
Everest	EVERC40	EVERC00	Houndpoint to Rotterdam	EVERC50	EVERC10	USD	CBL
Forties	FORTC40	FORTC00	Houndpoint to Rotterdam	FORTC50	FORTC10	USD	CBL
Fram	FRAMC40	FRAMC00	Mongstad to Rotterdam	FORTD50	FORTD10	USD	CBL
Gannet	GANNC40	GANNC00	Teeside to Rotterdam	GANNC50	GANNC10	USD	CBL

Crude Upstream and Midstream carbon intensity symbols

Crude Field	Upstream CI KgC02e/boe	Upstream CI Premium $/boe	Transport Route	Transport CI KgC02e/bbl	Transport CI Premium $/bbl	Currency	UOM
Bates:	U	c		u	c		
Joanne	JOANC40	JOANC00	Teeside to Rotterdam	JOANC50	JOANC10	USD	CBL
Judy	JUDYC40	JUDYC00	Teeside to Rotterdam	JUDYC50	JUDYC10	USD	CBL
Magnus	MAGNC40	MAGNC00	Sullom Voe to Rotterdam	MAGNC50	MAGNC10	USD	CBL
Nelson	NELSC40	NELSC00	Houndpoint to Rotterdam	NELSC50	NELSC10	USD	CBL
Ninian	NINIC40	NINIC00	Sullom Voe to Rotterdam	NINIC50	NINIC10	USD	CBL
Scott	SCOTC40	SCOTC00	Houndpoint to Rotterdam	SCOTC50	SCOTC10	USD	CBL
Tiffany	TIFFC40	TIFFC00	Houndpoint to Rotterdam	TIFFC50	TIFFC10	USD	CBL
Toni	TONIC40	TONIC00	Houndpoint to Rotterdam	TONIC50	TONIC10	USD	CBL
Ula	ULACC40	ULACC00	Teeside to Rotterdam	ULACC50	ULACC10	USD	CBL
Falah	AMRGN40	AMRGA00	Falah to Kiire	ASITN50	ASITA10	USD	CBL
Rashid	AMRGO40	AMRGB00	Mina to Kiire	ASITO50	ASITB10	USD	CBL
Upper Zakum	AMRGP40	AMRGC00	Zirku to Zhoushan	ASITP50	ASITC10	USD	CBL
Lower Zakum	AMRGQ40	AMRGD00	Zirku to Sikka	ASITQ50	ASITD10	USD	CBL
Al-Shaheen	AMRGR40	AMRGE00	Al-Shaheen to Singapore	ASITR50	ASITE10	USD	CBL
Oman Basin	AMRGS40	AMRGF00	Salalah to Tranmere	ASITS50	ASITF10	USD	CBL
Hassi Messaoud	AMRGT40	AMRGG00	Skikda to Tranmere	ASITT50	ASITG10	USD	CBL
Khurais	AMRGU40	AMRGH00	Ras Tanura to Ain Sukhna	ASITU50	ASITH10	USD	CBL
Abu Hadriya	AMRGV40	AMRGI00	Ras Tanura to Ain Sukhna	ASITV50	ASITI10	USD	CBL
Umm Shaif	AMRGW40	AMRGJ00	Zirku to Sikka	ASITW50	ASITJ10	USD	CBL
Nasr	AMRGX40	AMRGK00	Zirku to Sikka	ASITX50	ASITK10	USD	CBL
El Bunduq	AMRGY40	AMRGL00	Zirku to Sikka	ASITY50	ASITL10	USD	CBL
Abu Al Bukhoosh	AMRGZ40	AMRGM00	Zirku to Sikka	ASITZ50	ASITM10	USD	CBL
Canadon Seco	AMGNK40	AMGMN00	Comodoro Rivadavia to Long Beach	AMGQE50	AMGPH10	USD	CBL
El Medanito	AMGNJ40	AMGMM00	Bahia Blanca to Cherry Point	AMGQD50	AMGPG10	USD	CBL
Escalante	AMGNL40	AMGMO00	Comodoro Rivadavia to Long Beach	AMGQF50	AMGPI10	USD	CBL
Jubarte	AMGNM40	AMGMP00	Madre de Deus to Singapore	AMGQG50	AMGPJ10	USD	CBL
Roncador	AMGNN40	AMGMQ00	Madre de Deus to Galveston	AMGQH50	AMGPK10	USD	CBL
Castilla (Norte Este)	AMGNQ40	AMGMT00	Covenas Terminal to Jieyang	AMGQK50	AMGPN10	USD	CBL
Cupiagua	AMGNO40	AMGMR00	Covenas Terminal to Sikka	AMGQI50	AMGPL10	USD	CBL
Rubiales	AMGNP40	AMGMS00	Covenas Terminal to Jieyang	AMGQJ50	AMGPM10	USD	CBL
Varadero	AMGNR40	AMGMU00	Mariel to Antwerp	AMGQL50	AMGPO10	USD	CBL
Cuyabeno	AMGNT40	AMGMW00	Balao to Houston	AMGQN50	AMGPQ10	USD	CBL
Ishpingo	AMGNU40	AMGMX00	Balao to Panama Canal	AMGQO50	AMGPR10	USD	CBL
Jivino-Napo	AMGNV40	AMGMY00	Balao to Panama Canal	AMGQP50	AMGPS10	USD	CBL
Shushufindi-Aguarico	AMGNS40	AMGMV00	Balao toGalveston	AMGQM50	AMGPP10	USD	CBL
Liza 1	AMGNW40	AMGMZ00	FPSO Liza Destiny to Rotterdam	AMGQQ50	AMGPT10	USD	CBL
Liza 2	AMGPF40	AMGNI00	FPSO Liza Unity to Chiriqui Grande Terminal	AMGQZ50	AMGQC10	USD	CBL
Payara	AMGNX40	AMGNA00	FPSO Prosperity to Chiriqui Grande Terminal	AMGQR50	AMGPU10	USD	CBL

Crude Upstream and Midstream carbon intensity symbols

Crude Field	Upstream CI KgC02e/boe	Upstream CI Premium $/boe	Transport Route	Transport CI KgC02e/bbl	Transport CI Premium $/bbl	Currency	UOM
Bates:	U	c		u	c		
Abkatun	AMGPA40	AMGND00	Mexico STS to Daesan	AMGQU50	AMGPX10	USD	CBL
Chuc	AMGPB40	AMGNE00	Coatzacoalcos to Cartagena	AMGQV50	AMGPY10	USD	CBL
Pol	AMGPC40	AMGNF00	Mexico STS to Yokkaichi	AMGQW50	AMGPZ10	USD	CBL
Tsimin	AMGNZ40	AMGNC00	Dos Bocas to Corpus Christi	AMGQT50	AMGPW10	USD	CBL
Xux	AMGNY40	AMGNB00	Dos Bocas to Milazzo Anchorages	AMGQS50	AMGPV10	USD	CBL
Galeota (Trintes)	AMGPD40	AMGNG00	Galeota Point to Callao	AMGQX50	AMGQA10	USD	CBL
Santa Barbara	AMGPE40	AMGNH00	Jose Terminal to Singapore	AMGQY50	AMGQB10	USD	CBL

Shipping assumptions

- Vessel and cargo size: Aframax with 600K barrels
- Load Factor: 0.8
- Speed: 12.5 knots
- Fuel: LSFO

Heating of cargo or volume losses are not accounted for.

The carbon intensity premiums reflect the respective cost to offset the emissions from upstream production of each crude field, as well as the additional midstream carbon intensity cost to deliver each type of crude to specific refinery regions as highlighted below. Depending on the carbon intensity of each crude and carbon intensity of the route, the calculation is a $/b assessment that measures how much it would cost to use a removals voluntary carbon credit to compensate for the associated GHG emissions from the production of the crude as well as the route in question. The higher the carbon intensity, the larger the carbon intensity premium will be to account for the price of carbon removal. This is a calculated carbon intensity premium based on Platts CRC. Its goal is to increase transparency into the carbon intensity of each crude and each route and provide an indication of the cost associated with the carbon being accounted for through the purchase of voluntary carbon credits.

Refined Products

The carbon intensity premiums reflect the respective cost to offset the emissions from the production of key transportation fuels- gasoline, diesel, and jet, in the main geographical demand regions – US Gulf Coast, North-West Europe, and South-East Asia. The marginal downstream carbon intensity for these products will be calculated in the regional unit of measurement, e.g., kilograms of carbon dioxide equivalent per gallon (kgCO2eq/gal) for the USGC, kilograms of carbon dioxide equivalent per metric ton (kgCO2eq/MT) for NWE, and carbon dioxide equivalent per barrel (kgCO2eq/bbl) in South-East Asia. The overall calculated refined product carbon intensity reflects an aggregate of the different refinery configuration and crude runs based on weightings assigned to reflect the typical refinery operations in a region for a given quarter. The weightings are based on S&P Commodity Insights' view on the contributions from the different refinery types, including hydroskimming, cracking, coking, and crude diet.

When calculating the carbon intensity of refined products, S&P Global Commodity Insights analytics looks at the quantity of greenhouse gas emissions of current stand-alone refinery operations from the refinery entrance gate to the exit. It does not include any transportation to an oil storage terminal or to end-use customers. The carbon intensity numbers are calculated using University of Calgary's Petroleum Refinery Life Cycle Inventory Model (PRELIM) v1.6, combined with proprietary research and data from S&P Global Commodity Insights.

The model is a mass and energy-based process unit-level tool for the estimation of energy use and GHG emissions associated with processing a variety of crude oils within a range of configurations in a refinery. S&P Global Commodity Insights analytics uses a bottom-up approach with detailed data from Commodity Insights analytics databases, such as refinery type, crude runs and yields, to calibrate and customize the hypothetical refinery configurations that are modelled on PRELIM to reflect the region's current refining operations. The refinery configurations S&P Global Commodity Insights analytics models include hydroskimming, cracking (hydrocracking and/or FCC) and coking (hydrocracking and/or FCC), broken down by the existing capacity present in each region. Crude grades are selected based on the typical composition processed by the refinery (i.e., light/sweet, heavy/sour) for widely traded crude grades in that region. Changes in crude slate and runs are assessed every month/quarter.

Refined products carbon intensity symbols

Refined product	CI KgCO2e/bbl	CI Premium $/bbl	Region	Currency	UOM
Bates:	u	c			
Gasoil 10ppm FOB Singapore Cargo	ALCEG00	ALCEH00	Southeast Asia	USD	CBL
Gasoline Unl 92 FOB Singapore Cargo	ALCEI00	ALCEJ00	Southeast Asia	USD	CBL
Jet Kero FOB Singapore Cargo	ALCEK00	ALCEL00	Southeast Asia	USD	CBL

Refined product	CI KgCO2e/gal	CI Premium $/gal	Region		
Bates:	u	c			
Gasoline CBOB USGC Prompt Pipeline	ALCEM00	ALCEN00	US Gulf Coast	USD	CBG
Jet Kero 54 USGC Prompt Pipeline	ALCEO00	ALCEP00	US Gulf Coast	USD	CBG
ULSD USGC Prompt Pipeline	ALCEQ00	ALCER00	US Gulf Coast	USD	CBG

Refined product	CI KgCO2e/mt	CI Premium $/mt	Region		
Bates:	u	c			
Gasoline Eurobob (E5) FOB NWE Barge	ALCEA00	ALCEB00	Northwest Europe	USD	CBT
Jet FOB NWE Barge	ALCEC00	ALCED00	Northwest Europe	USD	CBT
ULSD 10ppm FOB NWE Barge	ALCEE00	ALCEF00	Northwest Europe	USD	CBT

US Methane Intensity

Period of assessment

The Methane Intensity data calculated by the S&P Global Commodity Insights analytics team is published monthly. This data rolls on the third Monday of each month.

Data around methane and Greenhouse Gas (GHG) emissions is derived from S&P Global Commodity Insights' analytics data published monthly in the following units of measure:

1) **Methane Intensity:** Methane emitted as a percentage of total production

2) **Methane Output:** metric tonnes of CH4/MMBtu of production

3) **Methane Output:** metric tonnes of CO2e/MMBtu of production

Methane Intensity published is for the previous month. For example, methane intensity data published in March will be for data representing methane emissions from February.

Data methodology

The S&P Global Commodity Insights analytics methane emission rate calculation is derived from daily methane concentration data collected by the Copernicus Sentinel – 5P satellite using the TROPOspheric Monitoring Instrument (TROPOMI) attached to the satellite. Platts estimates the methane emission rate with a top-down atmospheric inversion framework using a GEOS-Chem simulation to conduct monthly perturbation analysis of historical emission inventory data sets for each area of interest.

This process reflects a more accurate rate of methane emissions within these producing regions and can differ from self-reported data or real-time monitoring processes for individual projects within these regions. S&P Global Commodity Insights has focused its satellite model directly on the oil and gas producing facilities within each production basin to get the most accurate picture of the methane emissions rate generated by the US natural gas industry. However, because methane emissions are often a by-product of numerous other industries – including power generation, mining, and agriculture – and methane disperses within the atmosphere, the Methane Intensity calculations will capture some additional emissions data from other industries.

Methane Intensity Monthly

Assessment Name	Methane Intensity (% of total production)	Methane Output (tonnes of CH4/MMBtu)	Methane Output (tonnes of CO2e/MMBtu)
ARKLA-Haynesville	AMIPA00	AMIAA00	AMIXA00
East Texas-Haynesville	AMIPB00	AMIBA00	AMIYA00
Appalachian-Ohio	AMIPE00	AMIEA00	AMIAC00
Appalachian-Pennsylvania	AMIPF00	AMIDO00	AMIAD00
Appalachian-West Virginia	AMIPH00	AMIHA00	AMIAF00
Ft-Worth	AMIPI00	AMIIA00	AMIAG00
Bakken-US	AMIPJ00	AMIJA00	AMIAH00
Eagle-Ford	AMIPK00	AMIKA00	AMIAI00
Permian-Delaware	AMIPL00	AMILA00	AMIAJ00
Permian-Midland	AMIPM00	AMIMA00	AMIAK00
SCOOP-STACK	AMIPN00	AMINA00	AMIAL00
Denver-Julesburg	AMIPO00	AMIOA00	AMIAM00
Powder-River	AMIPP00	AMIQA00	AMIAN00
Anadarko	AMIPQ00	AMIRA00	AMIAO00
Piceance	AMIPR00	AMISA00	AMIAP00
Arkoma	AMIPS00	AMITA00	AMIAQ00
San Juan	AMIPT00	AMIUA00	AMIAR00
Green River-Overthrust	AMIPU00	AMIVA00	AMIAS00
Uinta	AMIPV00	AMIWA00	AMIAT00

North America Gas Carbon Intensity Assessments

Platts publishes daily and monthly data for price premia around natural gas from 22 representative production basins in North America as determined by the methane intensity of each region.

The S&P Global Commodity Insights natural gas carbon intensity measures represent averages throughout the gas value chain to reflect:

1) Blendings from multiple basin sources with varying production-level intensities.

2) Varying levels of required processing.

3) Large variations in transport distances from basin to key location.

All such factors contribute to variability in the final carbon intensity by location. Lowest carbon-intensity locations are those with shorter transport distances from basin to key location, less processing requirements (i.e., dry sweet gas) and lower methane emissions throughout the supply chain.

Frequency of publication

These carbon intensities are published monthly on the 15th of each month, while the associated carbon intensity cost on a daily cadence.

Location

Platts is publishing assessments for the following locations:

- AECO-C
- Chicago City-Gates
- Dawn
- PG&E Malin
- Eastern Gas, South
- Waha
- Kern River, Opal plant
- NGPL Midcontinent
- Algonquin City-Gates
- Henry Hub
- Houston Ship Channel
- SoCal Gas
- Transco Zone 6 Non-NY

Units

Carbon intensities for each location will be published in metric tonne of carbon dioxide equivalent per million British thermal unit of natural gas (mtCO2e/MMBtu). These values will be published monthly. MMBtu values are reflective of net heating value.

The carbon-accounted cost of the carbon intensity at these locations will be published daily in $/MMBtu, using the value applied to carbon assessed by the Platts Carbon Removal Credit Assessment (Platts CRC).

Data methodology

S&P Global Commodity Insights natural gas hub-level carbon intensity measures include well to destination supply chain emissions from drilling and completions activities, production, gathering and boosting, gas processing and pipeline transmission of gas to the hub locations. Intrinsic emissions data sources include S&P Global Commodity Insight's upstream analytics models for both North American (Energy Studio ImpactTM) and International (S&P VantageTM) oil and gas emissions, methane emissions Sentinel 5p satellite data, United States and Canadian regulatory reporting data coupled with a wealth of internal expertise and knowledge.

Emissions intensity is allocated for each stage of the natural gas supply chain in units of kilograms of carbon dioxide equivalent (based upon the 100-year global warming potentials (GWPs) from the IPCC 4th assessment report (AR4) per MMBtu of natural gas based upon a lower heating value (net calorific value). Emission sources considered are limited to carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). Both Scope 1 (direct) and Scope 2 (indirect associated with imported electricity based upon local grid intensity factors) emissions are included for each stage of the assessment. Emissions from the pre-production and production stages are allocated to natural gas based upon the energy ratio of gas to total oil and gas produced. For gathering and boosting, gas processing and gas transmission, emissions are allocated fully to the natural gas supply chain.

Natural gas feed sources into each hub are based upon detailed monthly natural gas pipeline flow information as per the specifications for each location. The number of fields or basins feeding each location ranges from one to twenty with production from millions of wells feeding into each one. Emissions are apportioned based upon how much gas from each basin/field into each trading hub to obtain the final carbon intensity at the location.

North America Gas Carbon Intensity

Location	Carbon Intensity (mtCOe/MMBtu)	Cabon Intensity Cost ($/MMBtu)
Chicago city-gates	ACCAU00	ACCAA00
AECO-C	ACCAV00	ACCAB00
Dawn Ontario	ACCAW00	ACCAC00
Eastern Gas South	ACCAX00	ACCAD00
Waha	ACCAY00	ACCAE00
NGPL Midcontinent	ACCBA00	ACCAG00
Kern River, Opal plant	ACCBB00	ACCAH00
PG&E Malin	ACCBD00	ACCAJ00
Algonquin City-Gates	ACCBG00	ACCAM00
Henry Hub	ACCAZ00	ACCAF00
Houston Ship Channel	ACCBE00	ACCAK00
SoCal Gas	ACCBC00	ACCAI00
Transco Zone 6 Non-NY	ACCBF00	ACCAL00

North America Renewable Natural Gas Assessments

Platts publishes North America Renewable Natural Gas (RNG) price assessments that reflect the premium that pipeline quality RNG receives to pipeline quality natural gas, delivered on a spot basis in North America, with a pathway that has a carbon intensity of 45. The carbon intensity of 45 represents that of a landfill. RNG, also known as biomethane, is purified biogas, which itself is an alternative to traditional, fossil fuel-derived natural gas, generated through the processing of organic residues from different feedstocks, many of which may otherwise emit methane into the atmosphere. Biogas can be generated by several sources, including from landfills, wastewater treatment facilities and livestock waste.

The North America Renewable Natural Gas Premium (California) price reflects the RNG premium for gas sold into California and the North America Renewable Natural Gas Premium (excl. California) price reflects the RNG premium for gas sold to consumers outside of California.

The North America Renewable Natural Gas carbon intensity value per point price represents the change in value of the North America Renewable Natural Gas Premium based on a one-point decrease in the carbon intensity. The price varies based on the value of the prompt quarter Low Carbon Fuel Standard (LCFS) credit price. The RNG premium increases for a production pathway with a carbon intensity less than 45 and decreases for a production pathway with a carbon intensity greater than 45. For example, a RNG production pathway with a carbon intensity of 10 at a carbon intensity value per point of $0.08 would have a higher RNG premium by (45 - 10) x $0.08 = $2.80. Similarly, a RNG production pathway with a carbon intensity of 100 at a carbon intensity value per point of $0.08 would have a lower RNG premium by (45 - 100) x $0.08 = (4.40).

Platts uses data from market participants to inform the assessment process for the RNG prices. Information used includes trades, bids, offers, and indicative values. Platts will normalize trade details such as carbon intensity and tenor in the assessment process where necessary.

In the absence of market information, Platts may publish a calculated price. The calculated price for North America Renewable Natural Gas Premium (California) represents the LCFS credit for the prompt quarter plus the cellulosic biofuel D3 RIN price for the current year. The LCFS credit is calculated by using the California Air Resources Board LCFS calculator found at: https://ww2.arb.ca.gov/sites/default/files/2022-03/creditvaluecalculator.xlsx. Platts uses the current compliance year for Diesel reference fuel with a Vehicle-Fuel EER of 0.9 in $/MMBtu of natural gas. The carbon intensity is 45 and the prompt quarter LCFS price is assessed by Platts at 1:30 pm Houston time each business day. The calculated price for the North America Renewable Natural Gas Premium (Ex-California) represents the cellulosic biofuel D3 RIN price for the current year only.

Vintage

Platts publishes daily RNG premium assessments for the spot market.

The spot assessment reflects transactions for immediate delivery and will normalize delivery timing difference.

Volume

Platts assessments reflect bids, offers and trades of any volume.

Location

Platts publishes daily premiums for RNG produced and purchased In North America, Including the US, Canada, and Mexico.

Units

Platts publishes its RNG premium assessments in $/MMBtu.

A standard conversion factor of 11.727 is used to convert the number of RINS per MMBtu of natural gas and a Vehicle-Fuel EER of 0.9 to convert the LCFS into MMBtu.

North America Renewable Natural Gas Premiums

Assessment Name	$/MMBtu
North America Renewable Natural Gas Premium (California)	AEWAA00
North America Renewable Natural Gas Premium (Excl. California)	AEWAB00
North Ameirca RNG CI value per point	AEWAC00

European Biomethane Guarantee of Origin and UK Biomethane Renewable Gas Guarantee of Origin Assessments

Platts publishes daily spot market assessments for European Biomethane Guarantees of Origin (GOs) and UK Renewable Gas Guarantees of Origin (RGGOs).

Both European GOs and UK RGGOs are electronic tracking certificates that represent the environmental attributes of 1 megawatt hour of biomethane entering the natural gas grid. Biomethane is purified biogas, which itself is an alternative to traditional, fossil fuel-derived natural gas, generated through the processing of organic residues from different feedstocks, many of which may otherwise emit methane into the atmosphere. Biogas can be generated by a number of sources, including from landfills, agricultural waste and livestock waste.

GOs and RGGOs are issued by the relevant registries certifying biomethane production within each country but can be traded and retired internationally. GOs and RGGOs represent a premium for gas with a clear organic pathway over the cost of gas with an undisclosed origin pathway in the natural gas grid.

Both GOs and RGOOs can be bought and sold until they are retired by a counterparty.

Platts' Biomethane GO and RGGO assessments reflect feedstock certificates spot and one year forward.

Platts' assessments reflect bids, offers and transactions as reported in either the Platts Market on Close assessment process, in the brokered market, or on trading and exchange instruments. Assessments are timestamped to 16:30 London time and are published according to the Platts London holiday calendar.

Platts also assesses European Guarantees of Origin (EuGOs), UK Renewable Energy Guarantees of Origin (REGOs), alongside US and International Renewable Energy Certificates. The specifications for these assessments can be found here: https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/global_renewables_certificates.pdf.

Feedstock definitions

Platts publishes daily Biomethane GO and RGGO assessments for several feedstocks with accompanying Carbon Intensity definitions.

Assessments for biomethane GOs and RGGOs from waste feedstock reflect a carbon intensity of between +25.00 g CO2e/MJ to +0.00 CO2e/MJ.

Assessments for biomethane GOs and RGGOs from manure feedstock reflect a carbon intensity of – 85.00 g CO2e/MJ and lower.

Assessments for biomethane GOs and RGGOs from crop feedstock reflect a carbon intensity of +25.00 g CO2e/MJ with no maximum. Platts understands that biomethane of significantly higher Carbon Intensity do not receive GOs.

Bids/offers/trades/indicative values received outside of these definitions may be normalised to these definitions during the assessment process.

Vintage

Platts publishes daily Biomethane GO and RGGO assessments for both spot and forward year markets.

The spot assessment reflects transactions for immediate delivery where contracts have a minimum validity of three months from the date of transaction. The forward year assessment reflects transactions for delivery in the next calendar year of contracts that are issued in that same calendar year.

Platts reflects both Biomethane GO and RGGO bids, offers and trades for contracts that remain valid for three months from the date of title transfer, with title transfer at time of trade.

For example, if Company A sold 1 GWh of Biomethane GOs to Company B on March 18, 2022, Company A would be able to deliver GOs of vintage June 2021 and later.

The majority of Biomethane GOs must be retired within 12 months of issuance, while UK RGGOs must be retired within 36 months of issuance.

Volume

Platts assessments reflect bids, offers and trades of a minimum of 1GWh of Biomethane GOs and RGGOs. Platts does not currently apply a maximum to the volumes reflected in its assessments.

Certification

The assessments for Denmark and the Netherlands reflect certified GOs while the RGGO assessments for the UK reflect uncertified volumes. Certification is considered as a voluntary standard achieved by a producer of biomethane which the market accepts as improving fungibility of the associated guarantee of origin. This includes, but is not exclusive to, standards such as ISCC and REDCert.

Subsidised and Unsubsidised certificates

Assessments for UK RGGOs are for subsidised certificates. Assessments for Denmark and the Netherlands include subsidised waste, unsubsidised waste and unsubsidised manure.

Location

Platts publishes daily Biomethane GO assessments for certificates issued for the current year and one year forward originating in the Netherlands, Denmark and Germany and available for trade internationally. Platts publishes daily Biomethane RGGO assessments for certificates issued for the current year and one year forward originating in the UK, and available for trade internationally.

Units

Platts publishes its Biomethane GO assessments in Eur/MWh, UK RGGOs are published in GBP/MWh, with conversions for Eur/MWh.

European Biomethane GO and RGGO Assessments

Assessment Name	Eur/MWh	GBP/MWh	Min	Max
UK Renewable Gas Guarantees of Origin (RGGO) Waste Spot	GORUA00	GORUC00	1 GWh	N/A
UK Renewable Gas Guarantees of Origin (RGGO) Waste Yr01	GORUA01	GORUC01	1 GWh	N/A
UK Renewable Gas Guarantees of Origin (RGGO) Crop Spot	AUKAA00	AUKAC00	1 GWh	N/A
UK Renewable Gas Guarantees of Origin (RGGO) Crop Yr01	AUKAB00	AUKAD00	1 GWh	N/A
Denmark Biomethane Guarantees of Origin (GO) Waste Spot	GORDA00	N/A	1 GWh	N/A
Denmark Biomethane Guarantees of Origin (GO) Waste Yr01	GORDA01	N/A	1 GWh	N/A
Denmark Biomethane Guarantees of Origin (GO) Manure Spot	ADENA00	N/A	1 GWh	N/A
Denmark Biomethane Guarantees of Origin (GO) Manure Yr01	ADENB00	N/A	1 GWh	N/A
Denmark Biomethane Guarantees of Origin (GO) Unsubsidised Waste Spot	DBGOA00	N/A	1 GWh	N/A
Denmark Biomethane Guarantees of Origin (GO) Unsubsidised Waste Yr01	DBGOA01	N/A	1 GWh	N/A
Germany Biomethane Guarantees of Origin (GO) Waste Spot	GORGA00	N/A	1 GWh	N/A
Germany Biomethane Guarantees of Origin (GO) Waste Yr01	GORGA01	N/A	1 GWh	N/A
Netherlands Biomethane Guarantees of Origin (GO) Waste Spot	GORNA00	N/A	1 GWh	N/A
Netherlands Biomethane Guarantees of Origin (GO) Waste Yr01	GORNA01	N/A	1 GWh	N/A
Netherlands Biomethane Guarantees of Origin (GO) Manure Spot	ANETA00	N/A	1 GWh	N/A
Netherlands Biomethane Guarantees of Origin (GO) Manure Yr01	ANETB00	N/A	1 GWh	N/A
Netherlands Biomethane Guarantees of Origin (GO) Unsubsidised Waste Spot	DBGOB00	N/A	1 GWh	N/A
Netherlands Biomethane Guarantees of Origin (GO) Unsubsidised Waste Yr01	DBGOB01	N/A	1 GWh	N/A

Related Markets

LNG

Platts publishes a number of Carbon Accounted LNG assessments. The specifications for these assessments can be found in the Global LNG methodology guide here:

https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/global_lng.pdf.

Metals

Platts publishes a number of Low Carbon Metals assessments. Please refer to the following guides:

https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/global_nonferrous.pdf

https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/global_iron_ore.pdf

https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/steel-ferrous-methodology.pdf

Fertilizers

Platts publishes a number of Low Carbon Fertilizer assessments. The specifications for these assessments can be found in the Fertecon methodology guide here:

https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/fertecon_specifications.pdf

Chemicals

Platts publishes a number of Low Carbon chemical assessments. Please refer to the following guides:

https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/americas-petrochemicals.pdf

https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/chemicals_europe_methodology.pdf

https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/asia_pacific_petrochemicals.pdf

Freight

Platts Publishes a number of Carbon-Accounted freight assessments. The specifications for these assessments can be found In the Global Freight methodology guide here:

https://www.spglobal.com/commodityinsights/PlattsContent/_assets/_files/en/our-methodology/methodology-specifications/global_freight.pdf

Revision history

August 2025: Platts discontinued Methane Performance Certificate and Methane Intensity Premium assessments.

April 2025: Platts added 27 additional Crude Carbon Intensities calculated in gCO2e/MJ and kgCO2e/bbl by the S&P Global Commodity Insights analytics team. Platts added new units in gCO2e/MJ for the existing 41 Crude Carbon Intensities which are calculated by the S&P Global Commodity Insights analytics team. Platts removed Producer Certified Gas.

November 2024: Platts created the Carbon Intensity and Low Carbon Markets Specifications Guide which followed the merging of the Low Carbon Gas, Carbon Intensity, and Methane Performance Certificate methodology guides. Platts also added reference to other low-carbon market assessments and their respective methodology guides. Platts clarified the roll calendar for methane intensity premium as of November 2024. Platts clarified the publishing schedule for carbon intensity calculations which feed into the Crude Carbon Intensity Premiums.