

Glossary of Energy Terms

A

API gravity

A measure of the weight of hydrocarbons according to a scale established by the American Petroleum Institute. Crude oils with higher values are lighter and tend to produce larger volumes of high-value lighter products in atmospheric distillation, which makes them relatively more valuable. Crude oil grades that are lower on the API scale tend conversely to be less highly valued because they produce smaller yields of lighter products.

assay

A laboratory assessment of the characteristics of a crude oil that help determine its market value and refining capabilities. Assays of some kind are usually required as part of all crude oil sales.

atmospheric distillation

The primary phase of all refining in which crude oil or other raw feedstock is boiled and the vapors are collected and condensed to create basic petroleum products.

B

backwardation

A relationship between prices in which the cost of prompt, immediately available supplies exceeds the price of volumes available in the future. Oil markets have been in backwardation for much of 1995 and 1996.

benchmark crude

A crude oil that is traded regularly enough in the spot market that its price quotes are relied upon by sellers of other crude oils as a reference point for setting term or spot prices. Brent, West Texas Intermediate, and Dubai are all benchmark crude oils.

Brent market

A widely traded group of spot, forward, and futures markets in North Sea Brent crude oil that emerged in the early 1980s. They are used as a key source of international oil price risk management and as a benchmark for crude oil pricing under both term and spot transactions. Forward trading extends several months ahead with supplies becoming "wet" at least 15 days prior to loading. A parallel futures market in Brent also exists on London's International Petroleum Exchange.

Brent B-wave pricing

A weighted average of Brent futures prices. This new 'B-wave' pricing formula was first adopted by Saudi Arabia in July 2000 (followed by Kuwait and, six months later, by Iran) for oil pricing in its term contract sales to Europe. It replaced the traditional dated Brent benchmark.

bunker fuel

Oil consumed as fuel by ships -- usually residual fuel oil but sometimes diesel.

C

CFD

See contract for differences.

catalytic cracking (cat cracking)

A secondary refinery upgrading process that converts heavy processed feedstocks such as vacuum gas oil into lighter products such as gasoline by passing the feedstock over a heated catalyst in order to break down, or crack, the heavy hydrocarbons into lighter ones.

cetane number

A measure of the ignition quality of diesel fuel that indicates the tendency of the oil to ignite spontaneously under pressure, which is a desired characteristic for diesel engines but not for gasoline engines.

c.i.f. (cost, insurance, and freight)

A price that covers delivery to a specified destination and insurance for that transportation. If insurance is not included it is referred to as C&F.

coker

A deep-conversion refinery unit that cracks feedstock severely at high temperatures. It takes low-quality residue and transforms it into light products and petroleum coke, completely destroying the resid.

con-carbon number (conradson carbon or CCR)

A measure of the amount of unwanted carbon produced in the refining process, with higher values indicating a less desirable feedstock.

condensates

Liquid hydrocarbons that are produced in conjunction with natural gas. They are chemically more complex than liquefied petroleum gases and are sometimes similar to crude oil or naphtha.

contango

The reverse of backwardation. A relationship between prices in which prompt, immediately available oil sells at discount to future supplies. Oil markets were in contango during most of the first half of 1990.

contract for differences (CFD)

A financial arrangement used in swaps and other financial dealings in which the arithmetic difference between two similar but opposite transactions is exchanged rather than the total amounts involved. The term CFD is used especially in oil to refer to these types of price swaps in the short-term Brent crude oil market, which provide a way to hedge the difference in price between spot supplies known as "dated" and first-month forward supplies known as "15-day."

cracked residue

The residual oil that is left over after the cracking process. Usually only suitable for use as residual fuel oil or as feed for a coker. (See cracker.)

cracker

An upgrading unit that converts heavier oils into light products by means of a catalyst (a catalytic or cat cracker) or by means of adding hydrogen in the presence of a catalyst (a hydro-cracker).

crack spread

A set of futures market transactions that attempts to simulate the commercial position of a refiner as a buyer of crude oil and a seller of refined products. The purpose is to duplicate the profit margin that exists in refining. The most popular crack spread on Nymex is known as the "3-2-1," or the purchase of three crude oil contracts against the sale of two gasoline contracts and one heating oil contract. This relationship may be reversed in winter when heating oil is in greatest demand.

crude oil

Petroleum in its raw state as it emerges from the ground with only minor processing to remove associated natural gas and gas liquids. This processing is usually done at or near the production site. Some synthetic oils that are produced from tar sands, extra heavy oils, or types of shale are refined like crude oil. Condensates are also very similar to crude oil, but usually lighter, and they are often refined like them.

D

deadweight tonnage

A rough measure of the carrying capacity of a tanker.

demurrage

An extra payment due to a ship owner if a tanker is forced to wait before loading or discharging.

derivatives market

A market where the value of the contract being traded is derived from an underlying commodity such as crude oil. These markets typically involve forward purchases or sales and can take the form of futures markets or over-the-counter swaps and options.

Dubai market

A widely traded international forward market in Mideast Dubai crude oil that emerged in the mid-1980s and is used as both a risk-management tool and a benchmark for crude oil pricing East of Suez. Forward trading usually extends for two or three months. Formal futures trading contracts have been attempted unsuccessfully by Singapore's Simex and London's IPE.

F

f.o.b. (free on board)

A price that only covers the cost of the material and the loading of it onto a ship or into a pipeline prior to transportation. Transportation and insurance are the responsibility of the buyer.

formula price

A price for crude oil, usually in a term contract, that is determined by a specified relationship to a benchmark crude oil or a group of benchmark crude oil grades or products. The formula also usually specifies the time lag from the point of loading at which the price is determined, the exact average to be used, and other variables.

forward market

An informal market that trades in the future delivery of a specific type of oil, with only some transactions resulting in physical delivery. Unlike a futures market, regulation is much less strict, and there is no clearinghouse or margin payments. These conditions tend to restrict trading to large oil companies and financial entities. (See "Brent market" and "Dubai market.")

futures market

A formal exchange that trades contracts for the delivery of a specific type of oil in future months. Only a very small volume results in physical delivery, and in some markets, there is only cash settlement. The presence of a clearinghouse and regular daily margin payments on all positions ensures the financial integrity of the operation at all times. The market is open to all participants.

G

gas oil

A heavier middle-distillate product that is produced at higher temperatures than kerosene and lower temperatures than residual fuel. Usually used as diesel fuel or home heating oil.

gasoline

A light distillate product that is usually produced through the reforming of naphtha, cracking of heavier products, and blending. It is the goal of most secondary refinery upgrading technologies. Used for internal combustion engines.

H

hedge

A position in a derivatives market that is designed to reduce price risk from a physical transaction. For example, the sale of a derivative in anticipation of future sales of physical supplies of oil or gas provides protection against possible declines in the price of the physical commodity.

hydro-cracking

A secondary refinery upgrading process similar to catalytic cracking that converts heavy processed feedstocks such as vacuum gas oil into lighter products such as gas oil, kerosene, and gasoline by passing the feedstock over a heated catalyst in the presence of hydrogen in order to break down, or crack, the heavy hydrocarbons into lighter ones and add carbon molecules to make the output lighter.

I

IPE

International Petroleum Exchange. A London oil futures market trading gas oil and Brent crude oil as well as options.

K

kerosene

A middle-distillate fraction that is produced at higher temperatures than naphtha and lower temperatures than gas oil. It is usually used as jet turbine fuel and sometimes for domestic cooking, heating, and lighting.

L

light naphtha

A category of naphtha that can be rich in paraffins and is used for ethylene cracking to make petrochemicals. However, if it is rich in aromatics and naphthenes it is used for reforming into gasoline or as blendstock for making gasoline.

liquefied petroleum gas (LPG)

A class of light hydrocarbons that are gaseous at atmospheric pressure but can be liquefied easily under pressure. They are produced as part of the refining process and also in conjunction with the production of crude oil and natural gas. They can be used both as a fuel and as feedstocks for making petrochemicals and other products. The two types are propane and butane.

LPG

See liquefied petroleum gas.

liquidity

In the oil market context, this refers to the volume of trading activity and diversity of participants in a particular arena. Greater liquidity allows trades to be executed quickly and easily at a uniform price; a lack of liquidity tends to prevent some interested participants from finding a buyer or seller at a given time. High-volume oil futures markets are the most liquid.

M

margin

For a refiner, the operating profit as measured by the difference between refined product prices and crude oil feedstock costs.

marker crude

A widely traded crude oil that is used as a reference point for setting the prices of other crude oil grades (see "benchmark crude").

metals content

A measure of the content of nickel, vanadium, iron, or other metals. High metals content can affect the fuel burning or upgrading characteristics of a crude oil or residue.

N

naphtha

One of the lightest cuts of the atmospheric distillation process that is vaporized at a temperature range of 5-165 degrees Celsius. Naphtha can be used as a feedstock for both gasoline manufacturing and petrochemicals depending on its quality, with light or paraffinic naphtha usually used in petrochemical plants and heavy or N+A naphtha usually used in reformers at refineries to make gasoline.

natural gas

Naturally occurring hydrocarbon gas that is predominantly methane and is produced both in conjunction with crude oil or separately. The methane, or dry gas, can occur with varying amounts of natural gas liquids, mainly ethane, pentane, and LPG, as well as condensates. These liquids are typically stripped from the methane as part of the production process. While methane is a highly desirable fuel, natural gas liquids can also be used as feedstocks for petrochemicals and other refining processes as well as for fuels.

natural gas liquids (NGLs)

The slightly heavier hydrocarbons produced with natural gas such as ethane, propane, butane, and pentane, or natural gasoline. These hydrocarbons are usually liquid or can be easily turned into liquids under moderate pressure. They can be used both as fuels and feedstocks. LPG is one of the main categories of NGLs.

netback

A calculation of the value obtained from the processing of a crude oil. It is derived from the yield of the refined products, prevailing refined product prices, and crude oil processing and transportation costs. It allows the comparison of the value of a crude oil to a refiner with the market price for the crude oil.

NGLs

See natural gas liquids.

Nymex

New York Mercantile Exchange. Futures market trading light crude oil (West Texas Intermediate), unleaded gasoline, heating oil, propane, natural gas, and options.

O

octane rating

A quality specification for gasoline that measures its tendency to ignite spontaneously creating engine knock and causing the engine to operate less efficiently. Two basic rating systems exist: the research octane number, or RON, and the motor octane number, or MON. In both cases a higher number means better quality. Lead has traditionally been used as a low-cost additive to raise the octane number of gasoline, but it has been banned in many countries for health reasons, requiring the use of other high-octane additives.

option

A derivative instrument that provides the right to buy or sell a commodity at a given price sometime in the future. The buyer then can choose whether or not to exercise the option depending on market conditions and investment strategy.

over-the-counter instrument

A derivative or other financial instrument that is customized for the individual buyer as opposed to being traded on a uniform basis in an organized exchange such as a futures market.

P

pour point

The temperature at which a crude oil or refined product such as residual fuel flows. Some crude oil grades and residual fuels must be heated in order to remain liquid, which is expressed as a high pour point, meaning that they can be difficult to handle and may require heated storage or tankers.

paper barrels

A generic term for oil that is bought and sold in forward or futures markets; thus, it involves commitments to make future deliveries rather than exchange of actual physical supplies (see "wet barrels").

R

reformer, reforming

In refining this usually refers to the process of catalytic reforming in a reformer unit, which uses heat and pressure in the presence of catalysts to convert naphtha feedstock into higher octane gasoline blending components or reformate. This is done mainly by converting lower-octane naphthenes into higher-octane aromatics.

Reid vapor pressure (RVP)

A measure of the volatility of petroleum products that is done by testing vapor pressure at 100 degrees Fahrenheit in pounds/square inch.

S

Simex

Singapore International Monetary Exchange. A futures market that trades oil contracts in high-sulfur residual fuel as well as the IPE Brent contract.

sour crude

Usually a crude oil that has a sulfur content that is greater than 0.5%. This higher sulfur content affects the quality of the resulting refined products and sometimes means extra processing is required. It is referred to as sour because of the unpleasant smell of the sulfur.

spot market

A market for immediately available single cargoes or other small lots of physical crude oil or refined petroleum products.

spread

A relationship between two prices, either for the same grade of oil at different time periods or for different grades of oil. These price relationships lie at the heart of much current oil trading since they tend to be less volatile than absolute movements in prices. Spreads also define the relative trends of prices between different markets and over time. (See "backwardation" and "contango.")

straight-run

A term used to describe any refined product that emerges from the initial refinery distillation of crude oil.

straight-run gas oil

A middle distillate that is produced from refinery distillation at temperatures usually ranging from 200-350 degrees Celsius. It usually is used for heating oil or diesel fuel.

straight-run residual oil or residue

The remaining portion of the crude oil feedstock that does not vaporize in the refinery distillation process. This product can be used directly as a boiler fuel, or it can be used as feedstock for vacuum distillation units.

sulfur content

A measure of the presence of sulfur in crude oil, which is a key determinant of quality. Sulfur content is measured as the percent of sulfur by weight in the crude oil. Crude oil grades that are high in sulfur are referred to as sour crudes, and those that are low in sulfur are referred to as sweet crudes.

swap

A financial risk-management tool in which two parties exchange differing market risk exposures in order to be assured of a fixed or predictable price, usually for an extended period of years. It may also involve short-term instruments in which risk is managed by the swaps provider rather than absorbed by a counterpart.

sweet crude

Usually a crude oil that has a sulfur content that is 0.5% or less by weight. Lower sulfur content improves the quality of the resulting refined products, and sweet crudes do not require as much processing as sour crudes. They are referred to as sweet because of the absence of an unpleasant sulfur smell.

T

term contract

A sales contract that specifies set price terms for the purchase of several cargoes of oil over a particular period in contrast to a spot transaction, which involves only a single cargo. Pricing, volume, and timing can all be quite flexible, with the essence being a continuing, regularized commercial relationship.

transparency

In relation to a market, this refers to the tendency for price signals and other market information to be easily visible to all participants and for market pressures to be quickly reflected in price levels.

U

ullage

The unoccupied space in a storage tank that is still available for use.

V

vacuum distillation

A secondary refining process in which straight-run residue is distilled in a vacuum in order to separate more light hydrocarbons than through atmospheric distillation. The output of the process is vacuum gas oil, which can be used as feedstock for cracking units, and vacuum bottoms or residue, which are usually used as boiler fuel.

vacuum gas oil (VGO)

The lighter product manufactured from the secondary refining process known as vacuum distillation. Vacuum gas oil is a preferred feedstock for cracking units to produce gasoline and gas oil.

viscosity

A measure of the ability of a liquid such as crude oil to flow. Viscosity is measured at a wide range of temperatures according to several different scales. The main scales are Kinematic, Redwood, Engler, and Saybolt. This is a critical characteristic of crude oil and residual fuel because it affects its handling.

VLCC (very large crude carrier)

A class of tanker with deadweight tonnage, or carrying capacity, of 200,000 tons or more. This is the usual size of tanker used to carry Mideast and other grades on long-haul voyages. Some ports and key canals such as Panama and Suez cannot handle these ships when fully laden.

W**West Texas Intermediate market**

The US spot crude oil market for West Texas Intermediate crude, which provides the foundation for the actively traded New York Mercantile Exchange light sweet crude futures contract. The main delivery points for spot trading are Cushing, Oklahoma, the base for the Nymex crude contract, and Midland, Texas.

wet barrels

A term that distinguishes the trading of physical oil supplies from the forward or futures transactions. Spot markets typically involve "wet barrel" transactions that result in the delivery of oil.