ENERGY COMPLEX

CRUDE OIL
HEATING OIL
GASOLINE
PROPANE
NATURAL GAS
COAL
ELECTRICITY

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NYMEX
NEW YORK MERCANTILE EXCHANGE

VISION IS OUR GREATEST COMMODITY™

NEW YORK MERCANTILE EXCHANGE ENERGY COMPLEX

The New York Mercantile Exchange, Inc. is the largest physical commodity futures exchange and the largest energy marketplace in the world. Its extensive suite of energy futures and options contracts offers a comprehensive series of cleared financial instruments that allow market participants to mitigate price risk in a transparent, liquid, financially secure marketplace.

Energy is perhaps the most strategic material in world commerce and its price can be exceedingly volatile. The availability and price of energy has a direct bearing on the competitiveness of the economies of industrial and agricultural nations alike. Countries that depend on the sale of energy resources have a vital interest in its price.

Energy resources are abundantly distributed around the globe. Most nations have at least some supplies of crude oil, natural gas, or coal.

During the extremely uncertain market conditions that existed at the time of the first oil crisis in 1973, when a decrease in supply and the expectation of shortages caused a dramatic leap in price, market participants had to ride out the volatility and hope for the best. Today, the extensive slate of energy futures and options contracts listed on the New York Mercantile Exchange enables buyers and sellers of energy to manage their exposure to market fluctuations and reduce their risk.

All Transactions are Cleared

All transactions on the Exchange are processed through its clearinghouse, which mitigates counterparty credit risk by ultimately acting as the buyer to every seller and the seller to every buyer. Transactions are backed by an extensive financial safety net, including a guarantee fund of approximately $135 million and a $100 million default insurance policy. For the last several years, the Exchange has received and maintained an AA+ long term counterparty credit rating from Standard & Poor's. A list of the Exchange clearing members can be found on its website, www.nymex.com.

Market transparency is one of the hallmarks of trading on the Exchange. Prices are continuously reported during the trading day, trading volume and open interest are reported daily, and physical deliveries under the futures contracts are reported monthly.

The prices quoted are used as global benchmarks for the underlying energy markets, an indication of the confidence that the market places in the integrity of these transactions. The Exchange maintains a vigorous regimen of trade, market, and financial surveillance to assure that business is conducted fairly and competitively among creditworthy market participants.

Given these resources, a decision not to manage energy price risk is made as deliberately as a decision to manage it.

What do Futures do for the Energy Markets?

Futures contracts trade in standardized units in a highly visible, extremely competitive, continuous open auction. To do this effectively, the underlying market must meet three broad criteria: the prices of the underlying commodities must be volatile, there must be a diverse, reasonably large universe of buyers and sellers, and the underlying physical or financially settled contracts must be fungible.

All market participants must work with a common denominator. Each understands that prices are quoted for products with precise specifications for grade and quality and for delivery to a specified point during a specified period of time.

The Exchange's core energy futures contracts for light sweet crude oil, heating oil, unleaded gasoline, and natural gas, along with Central Appalachian coal and propane futures, stipulate physical delivery, although deliveries usually represent only a minuscule share of the trading volume—less than 1% for energy—overall.

Allowing for physical delivery, however, ensures that market participants who so desire will be able to transfer physical supply, and that the futures prices will be truly representative of cash market values. Most market participants, however, choose to buy or sell the physicals through their normal channels, while simultaneously liquidating their futures positions.

The futures markets help businesses manage their price risk by providing a means of hedging; matching buyers and sellers of a commodity with parties who are either more able and willing to bear market risk, or who have inverse risk profiles. A crude oil producer, for example, might sell a crude oil futures contract to protect its sales price while a petroleum refiner might buy crude oil futures to protect its raw materials cost.

Because futures are traded on exchanges that are anonymous public auctions with prices displayed for all to see, the markets perform the important function of price discovery. The prices displayed on the floor of the Exchange and on its electronic platforms are disseminated to information vendors and news services worldwide. They reflect the marketplace's collective valuation of how much buyers are willing to pay and how much sellers are willing to accept. The diverse views of many market participants are distilled to a single price.

Why use New York Mercantile Exchange Energy Futures?

- The contracts are standardized, liquid financial instruments.
- The Exchange offers cost-efficient trading and risk management opportunities.
- Energy contracts are traded competitively on the Exchange in an anonymous auction, representing a confluence of opinions on future values.
- Futures prices are widely and instantaneously disseminated, serving as world reference prices.
- Exchange markets allow hedgers and investors to trade anonymously through futures brokers.
- The contracts can be easily liquidated prior to the required receipt or delivery of the underlying commodity.
- A contract's financial performance in the energy complex is supported by robust financial system, backed by the Exchange clearing members, which include the strongest names in the financial services industry. The system of guarantees provided through the clearinghouse mitigates counterparty credit risk.
- The Exchange offers safe, fair, and orderly markets protected by its rigorous financial standards and surveillance procedures.

Commercial Applications of NYMEX Energy Futures

- The Exchange provides buyers and sellers with price insurance and arbitrage opportunities that can be integrated into cash market operations.
- Trading Exchange contracts can reduce the working capital requirements and the physical storage costs associated with physical market operations.
- Trading Exchange contracts can improve the credit worthiness and add to the borrowing capacity of market participants.

The Benefits of Clearing

Off-exchange transactions submitted for clearing through NYMEX ClearPort® have many of the same advantages of Exchange-traded transactions:

- A system of guarantees provided through the clearinghouse mitigates counterparty credit risk.
- Costs are reduced because margin requirements are netted against other cleared positions on the Exchange.
- Customer funds are segregated from those of brokers, clearing members, and the Exchange itself.

As with the core energy contracts traded by open outcry, the Exchange clearinghouse becomes the ultimate counterparty to all other transactions, as well. The contracts submitted solely for clearing are converted to regulated futures contracts which give the parties an advantage over uncleared transactions or cleared swaps. Futures contracts cleared on U.S. exchanges have a level of legal protection not available to participants in over-the-counter (OTC) swaps transactions in the event of a bankruptcy by one of the parties to the trade.

The Exchange owns its clearinghouse, which gives it great flexibility and leeway in introducing new contracts and close control over margin levels and market and financial compliance. All transactions are subject to the regulations of the Exchange, which operates as a self-regulatory organization (SRO) serving as an additional layer of regulatory protection beyond the direct regulation of markets by the Commodity Futures Trading Commission, a U.S. government agency, which also maintains regulatory oversight of exchange markets.

Options are a Versatile Complement to Futures

Options on futures offer additional flexibility in managing price risk as a form of insurance. They give the holder of the options contract the right, but not the obligation, to buy or sell the underlying futures contract at a specific price and time, allowing participation in favorable price moves. If the market moves against the holder of an option, the holder can let the option expire worthless, with the only cost being the premium paid.

Options can be used alone or in combination with futures contracts resulting in strategies to fit any risk profile, time horizon, or cost consideration.

A Simple Futures Contract Grows to a Diversified Slate

Energy futures trading was established at the New York Mercantile Exchange with the introduction of the heating oil contract in 1978, the world's first successful energy futures contract. The product slate has evolved into an extensive list of futures contracts, related options contracts, and specialized options for inter- and intra-commodity price differentials and average prices.

Additionally, more than 180 futures and options contracts that replicate popular OTC transactions can be traded electronically or submitted solely for clearing through the NYMEX ClearPort electronic platform. The contracts cover outright and differential (basis) transactions for crude oil, natural gas, and refined products; and outright transactions for coal, electricity, European refined products, Asian fuel oil, freight rates for petroleum shipments on principal world tanker routes, and air pollution emissions credits.

The slate of off-exchange contracts trading on NYMEX ClearPort is closely tied to the core futures and options contracts because the settlement prices of the NYMEX ClearPort petroleum and natural gas contracts are determined either by the settlement of the open outcry energy futures contracts, price indexes published in specific trade publications, or a combination of the two.

Deep Market Liquidity

Efficient and effective futures and options markets typically require a mix of commercial hedgers and public speculators. The New York Mercantile Exchange energy futures complex has attracted private and institutional investors who seek to profit by assuming the risks that commercial market participants seek to avoid.

These investors, in combination with hedgers, have brought a healthy balance of participants and deep liquidity to the Exchange energy futures market.

After-Hours Electronic Trading

Trading in the core crude oil, heating oil, gasoline, natural gas, and propane futures contracts continues electronically after the close of the open outcry session. The electronic trading session commences within an hour of the close of floor trading Mondays through Thursdays, and concludes at approximately an hour prior to the resumption of floor trading the following day. On Sundays, the session opens in the early evening.

CRUDE OIL AND REFINED PRODUCTS

CRUDE OIL

Crude oil dominates the energy market, accounting for approximately 40% of world supply on an energy-equivalent basis. This market share and versatility makes it the world's most strategic and actively traded physical commodity. Since the introduction of the NYMEX light sweet crude oil futures contract in 1983, it has evolved into the world's most liquid forum for crude oil trading.

Crude oil is the raw material for gasoline, diesel, jet fuel, boiler fuels, and thousands of petrochemicals.

Petroleum is commercially produced on every continent except Antarctica, and in most of the world's nations. Oil is produced in the suburbs of Paris and downtown Beverly Hills. It flows from prolific wells in the Arctic wilderness of Alaska and Canada and the tropical jungles of South America and Southeast Asia. In the United States, all but a handful of states are oil producers.

The world's three largest oil producers are Russia, Saudi Arabia, and the United States. More than half of the world's economically recoverable reserves are found in the Middle East.

Since the early 1970s, the oil market has experienced periods of extreme price volatility. The course of individual market trends, ranging from six to 18 months, has pushed prices up by more than twofold and caused them to plunge by almost two-thirds.

The U.S. cash market benchmark grade, West Texas Intermediate (WTI), is deliverable at par against the futures contract, and other domestic and internationally traded foreign grades are deliverable at premiums or discounts to the settlement price.

Since crude oil production involves extensive commitment of resources, often many years in advance, the Exchange's light sweet crude oil futures contract is the most far-reaching of its products, listing contracts up to seven years forward.

Light sweet crudes are preferred by refiners because of their low sulfur content and yields of high-value products such as naphtha, gasoline, middle distillates, and kerosene.

Other Crude Oil Contracts

Brent crude oil, a light sweet North Sea crude, is used as an international pricing benchmark. A futures contract trades on the London trading floor of NYMEX Europe Limited, a subsidiary of NYMEX Holdings, Inc. Brent crude oil futures clear through the New York Mercantile Exchange clearinghouse in New York, which grants margin credits for spread transactions with the light sweet crude oil futures contract.

Brent calendar swap futures and WTI-Brent spread calendar swap futures are available for trading and solely for clearing on NYMEX ClearPort.

Other contracts available for trading or clearing through the NYMEX ClearPort electronic platform include futures for four domestic grades of crude oil: Light Louisiana Sweet, West Texas Intermediate-Midland, West Texas Sour, and Mars Blend. Also available are contracts on the differential of the light sweet crude oil futures and Canadian Bow River crude at Hardisty, Alberta, and outright contracts on Dubai crude oil.

Crude oil trades in units of dollars and cents per barrel.

NYMEX miNY™ Crude Oil Futures

The NYMEX miNY™ crude oil futures contract, designed for investment portfolios, represents 500 barrels of crude, half of the size of a standard futures contract. The contract is available for trading on NYMEX ClearPort. NYMEX miNY crude oil futures contracts are cash settled based on the settlement price of the standard-sized light sweet crude oil futures contract.

HEATING OIL

Heating oil, also known as No. 2 fuel oil, accounts for about 25% of the yield of a barrel of crude, the second largest "cut" after gasoline. The heating oil futures contract is also used to hedge diesel fuel, which is chemically similar to heating oil, and jet fuel, which trades in the cash market at a premium to heating oil futures.

A wide variety of businesses, including refiners, wholesale marketers, heating oil retailers, trucking companies, airlines, and other major consumers of distillate fuel oil, have embraced this contract as a risk management vehicle and pricing mechanism. The imposition of federal sulfur standards for diesel fuel have the potential to increase price volatility in some markets.

Since Exchange heating oil futures are traded over 18 consecutive months, traders can implement hedging strategies that encompass two winter heating seasons.

Complementing the heating oil futures contract are heating oil options, crack spread options, calendar spread options, and average price options. Look-alike heating oil options that are traded off-exchange can be submitted to the Exchange for clearing through NYMEX ClearPort.

Heating oil trades in units of dollars and cents per gallon.

Off-Exchange Contracts Play a Role in the Heating Oil Markets

New York Harbor is the principal cash and futures trading center for heating oil while refining capacity is concentrated on the Gulf Coast. The price differentials between these important market centers can be traded in cleared off-exchange transactions on NYMEX ClearPort as a way of protecting refining and sales margins.

The differentials represent a price signal that is indicative of the supply-demand balance in the respective markets. The price differential between the Gulf Coast and New York largely reflects the value of transportation, but a market dislocation in one region or the other can have a dramatic effect on prices. Prices are also sensitive to seasonal swings in demand. Traders are constantly aware of arbitrage opportunities that may arise from the price differences.

These transactions are available for trading on NYMEX ClearPort or can be traded off-exchange and submitted for clearing through NYMEX ClearPort.

The Exchange also makes cash-settled distillate fuel oil spread swaps available through NYMEX ClearPort. Other available cleared transactions include the heating oil crack spreads in New York Harbor and on the Gulf Coast; the differentials between the open outcry heating oil futures and Gulf Coast jet fuel; New York Harbor diesel fuel and heating oil; heating oil and gasoline in New York and on the Gulf Coast; and heating oil in New York vs. the Gulf Coast. The settlement price of the heating oil futures contract is a component of the settlement price of the spread contracts.

NYMEX miNY Heating Oil Futures

The NYMEX miNY heating oil futures contract, designed for investment portfolios, represents 21,000 gallons of heating oil, half of the size of a standard futures contract. The contract is available for trading on NYMEX ClearPort. NYMEX miNY heating oil futures contracts are cash settled based on the settlement price of the standard-sized heating oil futures contract.

GASOLINE

Gasoline is the single largest volume refined product sold in the United States and accounts for almost half of national oil consumption. Prices are volatile, reacting to political and economic developments that are perceived as being likely to affect the oil industry. Ever-tightening environmental regulations also add to market uncertainty.

New York Harbor is the major East Coast trading center that handles imported as well as domestic supplies. United States gasoline production totals about 7.1 million barrels a day. The sheer size of the gasoline market makes gasoline futures a valuable forum for risk management and price discovery.

Complementing the unleaded gasoline futures contract are gasoline options, crack spread options, calendar spread options, and average price options. Cash-settled gasoline options that are traded off-exchange can be submitted to the Exchange for clearing through NYMEX ClearPort.

Gasoline trades in units of dollars and cents per gallon.

Transactions on NYMEX ClearPort Help Manage Gasoline Market Risk

While New York Harbor is the gasoline futures trading center, the Gulf Coast is the principal refining center. Market participants actively trade the price differentials between these market centers as a way of protecting refining and sales margins because, as with heating oil and other refined products, market dislocations in one area or the other can have a significant impact on prices.

Traders are constantly aware of arbitrage opportunities that may arise from the price differences. The off-exchange calendar swap futures contracts offered for trading or clearing on NYMEX ClearPort give market participants additional trading flexibility through cash-settled instruments with the financial guarantees provided by the Exchange clearinghouse.

The Exchange also makes cash-settled gasoline spread futures contracts available through the NYMEX ClearPort trading platform that capture gasoline crack spreads in New York Harbor and the Gulf Coast, the differentials between the open outcry gasoline futures contract and Gulf Coast gasoline, gasoline and heating oil in New York and on the Gulf Coast, and gasoline in New York vs. the Gulf Coast. The settlement price of the open outcry gasoline futures contract is a component of the settlement price of the spread swaps contracts.

NYMEX miNY Gasoline Futures

The NYMEX miNY gasoline futures contract, designed for investment portfolios, represents 21,000 gallons of gasoline, half of the size of a standard futures contract. The contract is available for trading on NYMEX ClearPort. NYMEX miNY gasoline futures contracts are cash settled based on the settlement price of the standard-sized gasoline futures contract.

PROPANE

Propane is a by-product of natural gas processing and oil refining. National demand is about 1 million barrels per day, roughly one-third that of heating oil.

Propane is characterized by its diversity of uses—petrochemical feedstock, crop-drying in agriculture, and residential cooking and heating. Natural gas utilities often inject propane into their distribution systems during periods of peak demand.

The Exchange propane futures contract provides a pricing and risk management tool for the gas liquids sector of the energy industry.

The propane contract is a natural complement to the Exchange heating oil, crude oil, unleaded gasoline, and natural gas futures contracts.

Propane trades in units of dollars and cents per gallon.

NATURAL GAS

Natural gas plays a major role in the energy profile of the United States, where it accounts for almost a quarter of total energy consumption. Industrial users and electric utilities together account for approximately half of the market; commercial and residential users combined are approximately 40%.

Since the enactment of the Natural Gas Policy Act of 1978, the industry has changed from one that is almost totally regulated to one that operates largely as a free market. The Exchange launched the world's first natural gas futures contract in 1990, based on delivery at the Henry Hub in Louisiana, the nexus of 16 inter- and intra-state pipelines. The contract is the pricing benchmark for natural gas in North America, and is one of the most actively traded futures contracts for a physical commodity.

Complementing the natural gas futures contract are natural gas options, calendar spread options, average price options, and cash-settled European-style options.

Participation in the natural gas futures market composes a wide cross-section of the industry, from producers to end-users. Many natural gas and electric utilities either use the Exchange natural gas futures and options contracts, or are considering doing so.

The simple relationship of the value of natural gas at Henry Hub and the value of gas at other delivery locations has created an entire market dynamic between the hub and market centers throughout North America. Trading in these pricing differentials has developed into a vigorous market, where counterparty credit risk is also a concern. The Exchange offers for trading through NYMEX ClearPort a financially settled Henry Hub natural gas futures contract and a series of natural gas basis futures contracts covering approximately 40 key North American pricing points that provide market flexibility and mitigate counterparty risk.

Also listed for trading on NYMEX ClearPort are natural gas daily swing futures and monthly index futures, which let market participants hedge their risk with greater precision.

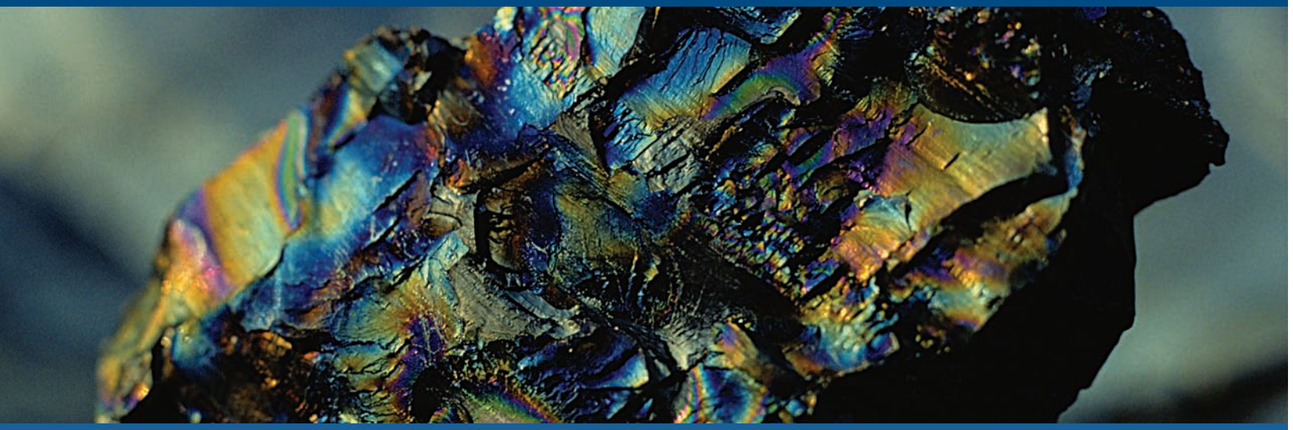
Swing futures help market participants cope with the daily volatility that can occur during the delivery month. Monthly index futures help mitigate the volatility that often extends into the delivery month.

Off-exchange transactions in these contracts can also be submitted solely for clearing through NYMEX ClearPort.

Natural gas trades in units of dollars and cents per million British thermal units.

NYMEX miNY Natural Gas Futures

The NYMEX miNY natural gas futures contract, designed for investment portfolios, is the equivalent of 2,500 million British thermal units of natural gas, one-quarter the size of a standard futures contract. The contract is available for trading on the NYMEX ClearPort electronic trading platform. NYMEX miNY natural gas futures contracts are cash-settled based on the settlement price of the standard-sized Henry Hub natural gas futures contract.



COAL

Coal, which helped power the industrial revolution, plays an enormous role in the U.S. energy industry and the economy overall. It is the principal fuel for generating electricity in the United States, accounting for approximately 55% of the nation's total power output.

The Exchange launched the physically delivered Central Appalachian coal futures contract in 2001, bringing the energy complex full circle to cover all principal fossil fuels. The Central Appalachian futures contract is based on barge delivery along the Ohio and Big Sandy rivers.

Two financially settled coal futures contracts are based on coal delivered by rail in the East via the CSX railway and by rail shipments from the Powder River Basin in the West. The coal contracts are available for trading or submission solely for clearing on the NYMEX ClearPort electronic platform.

The United States has more high-quality coal than any other country, with nearly 30% of the world's bituminous coal reserves. Only China produces more bituminous coal than the United States, but almost all of its production is consumed domestically. U.S. coal exports, chiefly Central Appalachian bituminous, make up a significant part of the world export market and are an important factor in world coal prices. At current rates of recovery and use, it is estimated that U.S. coal reserves will last more than 250 years.

Because coal is a bulk commodity, transportation is an important aspect of its price and availability. Railroads carry more than half of the coal mined in the United States, often hauling the coal in unit trains of from 60 to 120 cars. The inland waterway system is the other major mode for coal transportation.

Coal trades in units of dollars and cents per short ton.

ELECTRICITY

Electricity lends itself to futures trading because it meets the three broad criteria needed for successful futures markets: prices are volatile, there is a large, diverse universe of buyers and sellers, and the physical product is fungible.

The Exchange provides a series of financially settled futures contracts for electricity transactions at principal market hubs in New England, New York state, the Mid-Atlantic states, throughout the Midwest, California, and other western locations.

The contracts are for the peak and off-peak periods as defined by the North American Electric Reliability Council, the power industry's operations coordinating group.

The contracts include peak and off-peak monthly futures for the Pennsylvania-New Jersey-Maryland (PJM) Interconnection western hub, the American Electric Power Co./Dayton (AEP/Dayton) Hub, the Northern Illinois Hub, New York Independent System Operator (NYISO) Zone A (western New York), NYISO Zone G (Hudson Valley), NYISO Zone J (New York City), the New England Internal Hub, and the Midwest Independent Transmission System Operator (MISO) Cinergy, Michigan, Illinois, and Minnesota hubs.

Daily futures contracts are also available for PJM Interconnection western, AEP-Dayton, Northern Illinois and New England hubs, NYISO, and MISO Cinergy. A weekly electricity futures contract is listed for the PJM western hub.

Futures contracts for western locations are the Dow Jones Mid-Columbia Electricity Price Index futures, Dow Jones North Path-15 Electricity Price Index futures, Dow Jones Palo Verde Electricity Price Index futures, and Dow Jones South Path-15 Electricity Price Index futures.

All of the financially settled electricity contracts are listed on the NYMEX ClearPort platform either for trading or for submission solely for clearing.

Unlike traditional futures contracts that represent a fixed quantity, such as 1,000 barrels of crude oil or 1,550 tons of coal, the total quantities of power represented by most of the electricity contracts are variable because the number of peak and off-peak hours can vary from month to month.

For example, each financially settled monthly PJM futures contract covers 40 megawatt hours (MWh) for each peak day of the month. The number of peak days can range from 19 to 23, depending upon the month, and the number of megawatt hours represented by the monthly futures contracts will vary:

19 peak days per month = 760 MWh per contract.
20 peak days per month = 800 MWh per contract.
21 peak days per month = 840 MWh per contract.
22 peak days per month = 880 MWh per contract.
23 peak days per month = 920 MWh per contract.

Electricity trades in units of dollars and cents per megawatt hour.

FREIGHT FUTURES

The cost of freight can be a significant part of the landed price of crude oil and refined products, and can represent a risk because freight rates are competitive and can be volatile. There is often a close correlation between the movement of oil prices and the fluctuations in the cost of shipping the commodity.

To help market participants better manage their risk, the Exchange makes available cleared futures contracts on principal tanker routes carrying crude oil and clean products—heating oil, gasoline, and naphtha.

The routes covered by the slate of futures contracts include: Ras Tanura to Yokohama; Singapore to Japan; Middle Eastern Gulf to Japan; North Sea to continental Europe; Europe, West Africa, and the Caribbean to the U.S. Atlantic Coast; and the Caribbean to the U.S. Gulf Coast.

The contracts are financially settled, based upon the arithmetic average for the appropriate routes published by Platts *Oilgram Price Report* or by the Baltic Exchange in London.

The contracts are available for trading or can be submitted solely for clearing through NYMEX ClearPort.

Freight futures trade in units of dollars and cents per metric ton.

EMISSIONS ALLOWANCE FUTURES

To help market participants manage risk in the air emissions market, the Exchange lists futures contracts for sulfur dioxide (SO_2) and nitrogen oxide (NOX) emissions. The contracts provide for the transfer—the physical delivery—of allowances through the U.S. Environmental Protection Agency (EPA) allowance tracking system. Unused allowances from prior years can be "banked."

EPA manages cap-and-trade programs for the regulation of SO_2 emissions nationally and NOX emissions for the eastern United States. Allowance trading enables each source to design its own pollution control strategy, tailor that strategy to the types of fuel used, manage their investment in pollution control equipment, and purchase or sell allowances.

Allowances may be bought, sold, and traded by any individual, corporation, or governing body, including brokers, municipalities, environmental groups, and private citizens. The prices of allowances are subject to the changes in supply and demand, and are influenced by the types of fuels that are available, the demand for the products produced in the emitting plants such as electricity, and weather.

The contracts are available for trading or for submission solely for clearing on NYMEX ClearPort.

Emissions allowances trade in units of dollars and cents per short ton.

SPREAD TRADING AND
SPECIALITY OPTIONS CONTRACTS

HEDGING

SPREAD TRADING AND SPECIALTY OPTIONS CONTRACTS

Any combination of energy futures contracts and/or months may constitute a spread in the Exchange energy complex. Spreads can be traded by open outcry or electronically.

A spread trade executed on the Exchange is treated as a single transaction for the purpose of determining a market participant's margin requirement. The minimum margin requirement takes into account that the risk on one side of the spread is generally reduced by the other leg of the spread. The following are brief descriptions of the most commonly traded spreads.

Intra-market or Calendar Spreads

The simultaneous purchase and sale of a futures contract in any one commodity (crude oil, heating oil, gasoline, natural gas, propane, electricity, or coal) in two different months at a stated price differential is a calendar spread.

Inter-market Spreads

Also known in petroleum markets as "trading across the barrel," inter-market spreads consist of the simultaneous purchase and sale of more than one economically related futures contract—heating oil and gasoline, natural gas and electricity or propane, or coal and electricity—in one or more months at a stated price differential. The crude oil/heating oil and crude oil/gasoline differentials are known as "crack spreads."

Spreads between contracts in the Exchange's core futures markets and cleared-only transactions on NYMEX ClearPort are recognized for net margining purposes. A list of spread margin credits is available on the Exchange website, www.nymex.com, under the "Markets" tab.

Crack Spreads

A crack spread is the simultaneous purchase and sale of a crude oil futures contract and a gasoline or heating oil futures contract in one or more months at a stated price differential. It represents the theoretical profit (or loss) between the cost of crude oil and the price realized in the market for the refined products. The crack spread gets its name from the "cracking" of crude oil at a refinery into products.

The use of crack spreads have proven to be particularly useful since crude oil and product prices can fluctuate dramatically in response to extreme weather conditions or political crises, sometimes generating high margins for refiners and marketers, but at other times severely squeezing their profitability.

A futures crack spread is treated as a single transaction for the purpose of determining a market participant's margin requirement.

In a crack spread transaction, the number of crude oil contracts must equal the total number of product contracts. Crack spreads often reflect real world refining ratios. A popular spread is the 3:2:1 spread, which uses the prices of three barrels of crude, two barrels of gasoline, and a barrel of heating oil to determine the spread. Another common spread uses the 5:3:2 ratio, and many other ratios are used as well.

Similar strategies involving other energy products, such as natural gas and propane—the fractionation spread, and natural gas or coal and electricity—the spark spread, are calculated on a British thermal unit-equivalency basis.

Futures contracts and off-exchange transactions representing crack spreads are also available for trading and clearing through NYMEX ClearPort.

Crack Spread Options

The crack spread options contracts were the first exchange-traded options contracts to be based on inter-market spreads. The options are listed as two separate contracts, one on the spread between New York Harbor unleaded gasoline and light sweet crude oil futures, the other on the heating oil/crude oil spread.

Crack spread options are American-style options that can be exercised into the underlying futures contracts at any time.

The crack spread options trade with a 1:1 ratio of crude oil to the product. They differ from conventional options in that a single options position results in two futures positions when the options contract is exercised.

Crack spread options are standardized Exchange instruments. They allow the hedge to be accomplished with the payment of one options premium instead of two. Crack spread options also offer the inherent advantages of outright options on futures, which allow market participants with commercial exposure to tailor their hedge to their price risk without giving up the ability to participate in favorable market moves.

When the holder of a crack spread *call* exercises its contract, the writer of the options contract is obligated to *sell* the holder a gasoline or heating oil futures contract and purchase a crude oil futures contract for the agreed-upon spread relationship.

Conversely, when a crack spread *put* is exercised, a writer is obligated to *purchase* a gasoline or heating oil futures contract from the holder, and to sell the crude oil futures contract at the agreed-upon spread value.

Crack spread options offer a number of benefits:

- Refiners, blenders, and marketers have a flexible hedge against variable refining margins in heating oil and gasoline.
- Puts give refiners an instrument for locking in crude cost and product margins without penalty to further market gains.
- Calls afford product marketers protection during unstable spread increases.
- Crack spread options generally furnish traders with an efficient mechanism for hedging the changing relationship between crude and products.
- Crack spread options allow refiners to generate income by writing options.

Calendar Spread Options

In an effort to help market participants mitigate the price risk that is present between contract months of a futures contract, the Exchange lists calendar spread options on its light sweet crude oil, heating oil, gasoline, and natural gas futures contracts.

Calendar spread options are European-style options that can be exercised into the underlying futures contracts only at the end of the contract month.

The contracts are options contracts on the price differential between two delivery dates for the same commodity. The price spread between contract months can be extremely volatile because the energy markets are more sensitive to weather and news than any other market. A change in the magnitude or direction of the month-to-month price relationships can expose market participants to severe price risk, which could adversely affect the effectiveness of a hedge or the value of inventory. Calendar spread options can allow market participants who hedge their risk to also take advantage of favorable market moves.

To put market relationships in perspective, one must keep in mind two terms which describe the price curve. When the price for a contract month nearer to the present time is higher than the price for a contract farther into the future, the market is said to be in *backwardation*. Typically, this means that prices are high because supplies are tight; in this case, the strike price for a calendar spread options contract will be a positive number.

Conversely, when the nearby price is less expensive than the farther-dated prices, the market is in *contango*. When the price curve is in contango, strike prices of calendar spread options contracts will be negative. A negative price is not unusual in spread relationships.

A commodity's price curve is likely to change over time. Calendar spread options can be used to manage the exposure a business has to these changes.

In contango markets, a refiner, who is a seller of heating oil, would seek downside protection by buying puts (which give it the right, but not the obligation, to sell futures at a specified price); a buyer of heating oil would purchase calls (which give it the right, but not the obligation, to buy futures at a specified price). A refiner or marketer with excess storage capacity can make money when the price curve is in contango by purchasing the cheaper prompt month and selling the more expensive deferred contract month.

When the markets are in backwardation, however, spare storage capacity is an asset that generates no cash flow. Selling put options on calendar spreads generates cash flow, and having the asset as a backstop enables the oil company to sell the put.

Additionally, in a steeply backwardated market, it can be costly to buy back a hedge after it has appreciated in value on its way to becoming the prompt month. Buying calls on the calendar spread can reduce such costs, and can complement the short hedge by allowing for participation in the rising market.

At exercise, the buyer of a put options contract will receive a short position in the futures market for the closer month and a long position in the futures market for the farther-dated month. The buyer of a call options contract will receive a long position in the futures market for the closer month and a short position in the futures market for the farther month.

Average Price Options

Average price options are settled against the average of prices for an underlying commodity over a period of time and are useful as a way of dampening market volatility.

Average price options are financially settled upon expiration and cannot be exercised into the underlying futures contract.

The settlement price for an average price call options contract is the difference between the average front month settlement price over the calendar month of the underlying futures contract and the strike price. The settlement price of an average price put options contract is the difference between the strike price and average front month settlement price over the calendar month of the underlying futures contract. The Exchange lists average price options for crude oil, heating oil, and New York Harbor unleaded gasoline.

The contracts are available for trading by open outcry or for clearing on NYMEX ClearPort. By submitting an options contract for clearing, market participants can negotiate their own strike prices and premiums for an options position on any contract month for which there is an underlying futures contract.

European-Style Look-Alike Options

The cash-settled European-style energy options contracts available solely for clearing offer market participants flexible instruments for managing price risk in the crude oil, heating oil, and unleaded gasoline markets. European-style natural gas options are available for clearing on NYMEX ClearPort and for trading on the floor by open outcry.

European-style options are settled only on expiration day. These options contracts are settled in cash and cannot be exercised into the underlying futures contracts. In other respects, the contracts are similar to the corresponding floor-traded American-style options contracts, which can be exercised at any time.

The strike prices for all European-style options will initially be identical to the related floor-traded options contracts, although strike prices will be added on an as-needed basis. Registered users of NYMEX ClearPort or brokers can add strike prices by calling customer service before noon each business day for listing on the next Exchange business day.

Cleared transactions will be executed as exchange of options for options (EOO) transactions.

Inventory Options

The Exchange offers clearing services for OTC options on the weekly crude oil and natural gas storage numbers released by the Energy Information Administration (EIA) of the U.S. Department of Energy. The options trade through an electronic auction in which the options prices are based solely on the relative demand of participants—the more popular the strike, the greater its value. The options are offered for trading by ICAP and cleared by the Exchange.

These contracts help market participants manage exposure to the impact of the inventory reports. The strike units of the options are the number of millions of barrels of crude oil or billions of cubic feet of natural gas that could potentially be the difference in inventory from the previous week's report.

The inventory statistics auctions are held the night before the release of the EIA weekly inventory reports. The change in the inventories determines which options are in-the-money and which are out-of-the-money. The premium collected from those holding out-of-the-money options is paid to those holding in-the-money options.

There are two types of options: vanilla options, which act as traditional puts and calls with the in-the-money options setting a floor under or a cap over the at-the-money strike price; and digital options, which pay a fixed amount for in-the-money contracts.

HEDGING

The New York Mercantile Exchange's competitive, transparent markets are excellent indicators of price, and allow commercial market participants to engage in efficient hedging strategies. Basic hedging examples follow. Actual transactions will not necessarily offset each other precisely, but these examples will illustrate the principles of hedging. The perfect hedge is a rarity, and some basis risk—the uncertainty as to whether the cash/futures spread will widen or narrow between the time a hedge position is implemented and liquidated—will almost always be present.

For a comprehensive review of hedging strategies, see the Exchange publication "A Guide to Energy Hedging," available on the Exchange website, www.nymex.com.

Short Hedge

One of the most common commercial applications of futures is the short hedge, which relates to the protection of inventory value. Once title to a shipment of oil is taken anywhere along the supply chain, from wellhead to consumer, its value is subject to price risk until it is sold or consumed. Because the value of oil in storage or transit is known, a short hedge can be used to essentially lock in the inventory value.

A general decline in prices generates profits in the futures market, which are offset by depreciation in inventory value. The opposite applies when prices rise.

The advantage of short hedging is related to the risk associated with the resale margin obtainable and has a variety of commercial applications.

Example: Short Hedge

Oil Producer Fears a Price Decline

June 15: The producer anticipates that it will sell in the cash market in July 1,000 barrels a day at July postings of $50 a barrel. The expected receipts on 25 days' production (25,000 barrels at $50 each) is $1,250,000.

In the futures market, the producer sells 25 August light sweet crude contracts (the contracts are 1,000 barrels each) for $48 each, the prevailing price on the Exchange. The futures sale realizes $1,200,000.

July 1–25: If prices fall, as the producer anticipated, it sells 1,000 barrels per day at the actual market price of $49 a barrel, realizing $1,225,000. That is $25,000 less than budgeted.

The producer also buys back its futures contracts so it doesn't have to stand for delivery. The contracts originally sold for $48 ($1,200,000) are now worth $47, valued at $1,175,000. This gives it a gain in the futures market of $25,000. So, the cash market sale of $1,225,000 plus a futures gain of $25,000 equals a net amount of $1,250,000, the budgeted sum.

What if instead of falling, as was expected, prices rise? What happens to the producer's hedge?

In that case, assume the cash market rises to $51. The producer's 25,000 barrels realize $1,275,000. But, it sold futures at $48 ($1,200,000 total), and doesn't want to have to deliver those barrels. So the producer buys its contracts back. However, the futures price has risen, too, to $49 a barrel.

The 25 contracts are valued at $1,225,000, which is what it must pay to buy them back, ($25,000 more than the sale price).

So, the cash market sale of $1,275,000, minus a futures loss of $25,000, equals a net of $1,250,000, the desired amount.

Long Hedge

The long hedge involves a commitment to purchase products in the future at a fixed price. If a cash market buyer commits to buy barrels at a fixed price from a seller in the future, then the long hedge will fix the buyer's margin by locking in the acquisition cost.

A number of these long hedges have risen with the growth of cash-forward markets, where traders may commit to sell forward at today's cash price against an unknown future cost.

The end-user with a fixed fuel budget can also use a long hedge to establish a fixed cost, though not necessarily a fixed margin. In some cases, a margin may be unimportant or difficult to identify, as in the case of municipal governments. In other cases, in which fuel costs are a significant portion of operating expenses, a fixed margin might be established when income from operations can be predicted with some accuracy, such as taxi fleets, trucking companies, or airlines.

Example: Long Hedge

Marketer Establishes a Fixed-Price Sales Account

A heating oil marketer may offer customers fixed-price contracts for a number of reasons: to avoid the loss of market share to other marketers or to alternative fuels, to expand market share, or to bid on municipal contracts requiring a fixed price.

However, by offering to sell at a fixed price over the season, the marketer is exposed to the risk that prices will increase, perhaps to the point of being unprofitable (Case A, page 31).

Thus, to fix its acquisition costs, the marketer might take a long hedge against a forward sales commitment. If its wholesale buying prices increase, profits on the futures market will offset the price increase in the cash market, keeping its retail margin constant.

Similarly, if wholesale costs decrease, the lower acquisition costs will be offset by a loss on the futures (Case B, page 31).

The long futures hedge taken at the time the marketer enters into the fixed-price sales contract could fix the resale margin, provided the basis is stable. The chart shows the effect of an unstable basis (Figure 1).

In the following cases it is assumed that, if the basis remains stable, the fuel retailer guarantees itself a margin of $0.25 a gallon over its acquisition cost. Twenty-four cents is the difference between the December futures price of $1.60 a gallon and the fixed December revenue of $1.84, plus a $0.01 basis differential between New York Harbor and the retailer's location.

With a stable basis, as in the following cases A and B, spot-price changes in either direction are the same for both New York and the marketer's location. As a result, a decline in the futures price, which causes a loss in the futures market, is offset cent-for-cent by the increase in the cash margin.

Potential Basis Changes (Figure 1)

	Rising Market		Falling Market	
Cash/Futures Position	Cash price rises less than futures	Cash price rises more than futures	Cash price falls less than futures	Cash price falls more than futures
Bought in the cash market/Sold the futures	Loss	Gain	Gain	Loss
Sold in the cash market/Bought the futures	Gain	Loss	Loss	Gain

CASE A: Rising Prices

On November 25, the dealer buys 168,000 gallons in the cash market for $1.62 a gallon, the going price, based on a New York Harbor cash quotation of $1.63. Cost: $272,160.

The dealer sells its four December futures contracts (initially bought for $1.60) at $1.63 a gallon, the current price on the Exchange, realizing $273,840 on the sale, for a futures market profit of $5,040.

The cash margin is $0.22—the difference between the agreed-upon sales price of $1.84 and the cash market acquisition cost of $1.62—for a total of $36,960 ($0.22 per gallon x 168,000 gallons).

So, a cash margin of $36,960, plus a futures profit of $5,040, equals a total margin of $42,000 ($0.25 per gallon x 168,000 gallons).

Less operating expenses of $0.10 a gallon ($16,800) = Profit: $25,200.

CASE B: Falling Prices

On November 25, the dealer buys 168,000 gallons at its local truckloading rack for $1.52 a gallon, the prevailing price on that day, based on the New York Harbor cash quotation of $1.53 a gallon.

The dealer sells its four December futures contracts (initially bought for $1.60 a gallon) for $1.53 a gallon, the Exchange price that day, realizing $257,040 on the sale, and experiencing a futures loss of $11,760.

But its cash margin has soared to $0.32 a gallon, for a total of $53,760, because, while the acquisition cost was $1.52, the customer has agreed to buy it for $1.84.

So, the cash margin of $53,760, minus the futures loss of $11,760, equals a total margin of $42,000 ($0.25 a gallon x 168,000 gallons).

Less operating expenses of $0.10 a gallon ($16,800) = Profit: $25,200.

MARGIN REQUIREMENTS, POSITION ACCOUNTABILITY LEVELS, AND EXCHANGE INFORMATION

Margin Requirements

The New York Mercantile Exchange requires its market participants to post and maintain in their accounts a certain minimum amount of funds for each open position held. These funds are known as *margin* and represent a good faith deposit or performance bond that serves to provide protection against losses in the market. The Exchange collects margin directly from each of its clearing members who, in turn, are responsible for the collection of funds from their clients.

The Exchange uses the Standard Portfolio Analysis of Risk (SPAN®) margining system to establish minimum margin levels for clearing firms and their customers. SPAN, developed by the Chicago Mercantile Exchange, has become the futures industry's standard of margining. SPAN evaluates the risk of a trader's entire portfolio and establishes plausible movements in futures prices over a one-day period. The resulting effect of these "risk arrays" is to capture respective gains or losses on futures and options positions across the energy commodities.

One of the special characteristics of options is that a long options position can never be at risk for more than its premium. In order to assess the risk of all positions in the portfolio and at the same time allow credit for the premium involved, SPAN allows the excess of the options premium over the risk margin for any options position to be applied to the risk margin on other positions.

Margin requirements and contract specifications are subject to change; please contact the Exchange or your broker for current information.

Position Accountability Levels

The Exchange sets guidelines for the net open positions that a single trader or a firm can hold on any one month or all months' combined basis in a commodity—with the exception of the spot month, when hard position limits apply. The Exchange will contact a market participant who approaches or exceeds a position accountability level and will require additional information related to such a position. If, upon review, the Exchange is concerned that the size of the position is a threat to the orderly operation of the market, the market participant will be directed either to not increase or to decrease its position. Position accountability levels are designed to effectively oversee markets and avoid any concentrations which may threaten the orderly operation of a market.

24-Hour Market Information Services

Exchange information is available to the public 24 hours a day through www.nymex.com, including futures and options prices and trading volume (available on a 30-minute delayed basis during the trading day), contract specifications, historical data, Exchange holidays, trading hours, rules, and important announcements.

Quote Services

The daily futures and options price quotations are disseminated by a large number of information service vendors. The Commodity Code Directory, available on the website in the "Resources" section, lists the principal information service vendors and the information retrieval codes for Exchange contracts.

For further information, please contact an Exchange marketing representative at (212) 299-2301 or e-mail marketing@nymex.com.

New York
World Financial Center
One North End Avenue
New York, NY 10282-1101
U.S.A.
(212) 299-2301

Houston
1000 Louisiana Street
Suite 1095
Houston, TX 77002-5005
U.S.A.
(713) 658-9292

Tokyo
San Marino Shiodome
6th Floor
2-4-1 Higashi Shinbashi
Minato-ku, Tokyo 105-0021
Japan
+81 (0)3 5408-5291

London
Veritas House
7th Floor
125 Finsbury Pavement
London, EC2A 1NQ
U.K.
+44 (0)20 7920-0349

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