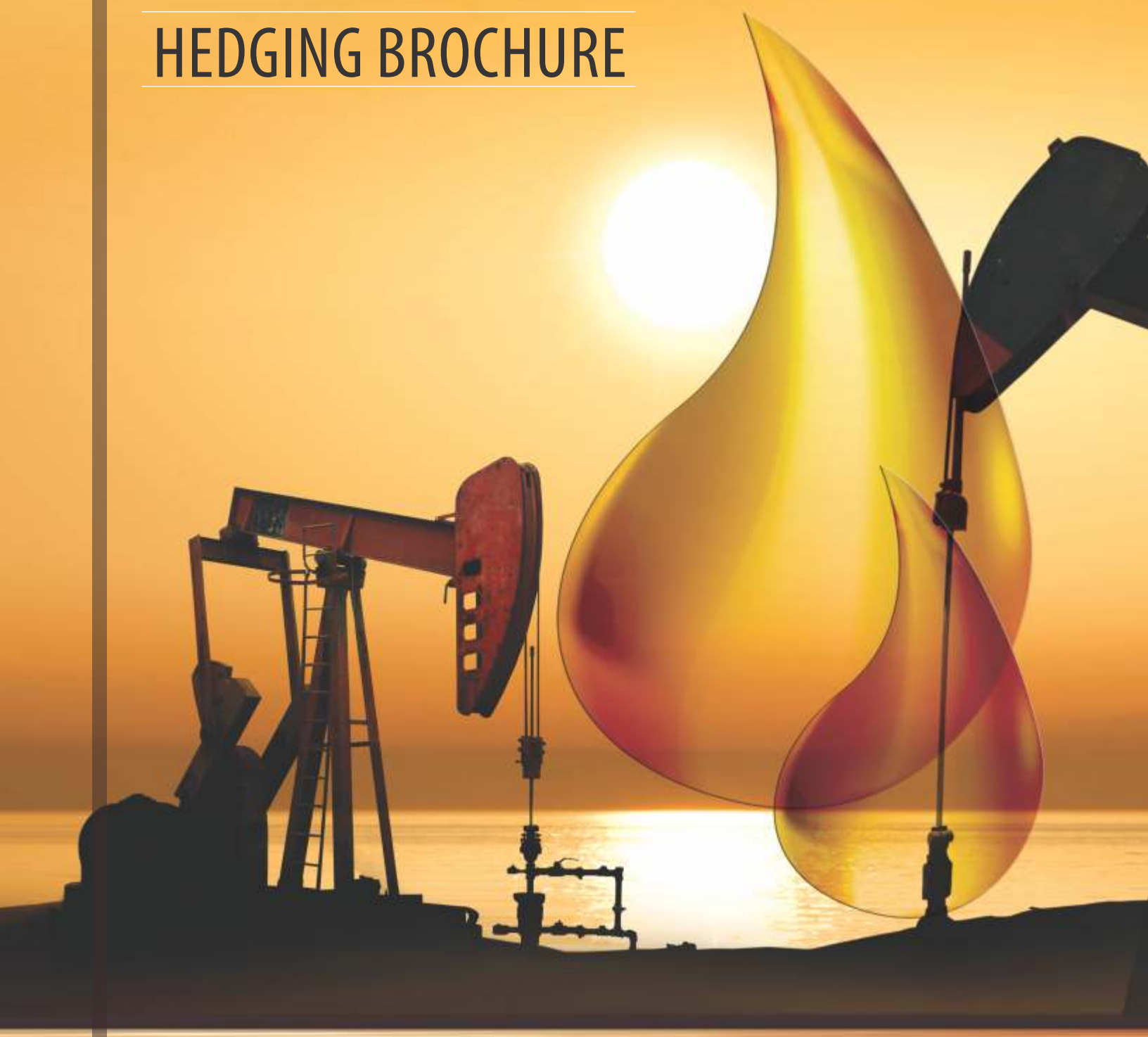
MCX
METAL & ENERGY
Trade with Trust

MCX INVESTOR
PROTECTION FUND

CRUDE OIL

HEDGING BROCHURE







Crude oil or petroleum is a naturally occurring and flammable liquid found in rock formations in the earth. It consists of a complex mixture of hydrocarbons of various molecular weights plus other organic compounds. The main characteristics of crude oil are generally classified according to its sulphur content and density, which the petroleum industry measures by its American Petroleum Institute (API) gravity. Crude oil is one of the most economically mature commodity markets in the world. Even though most crude oil is produced by a relatively small number of companies, and often in remote locations that are very far from the point of consumption, trade in crude oil is both robust and global. Nearly 80% of international crude oil is transported through waterways in supertankers.
Oil traders are able to quickly redirect transactions towards markets where prices are higher. Oil and coal are global commodities that are shipped all over the world. Thus, global supply and demand determine prices for these energy sources.

The oil industry runs by converting risks into opportunities.



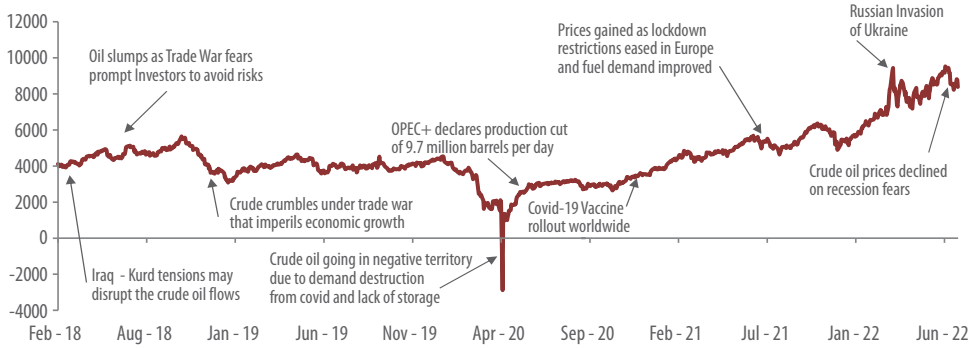
INTRODUCTION

Crude oil may be considered light if it has low density with an API gravity of less than about 40°. Typically, heavy crude has high density with API gravity of 20° or less. Brent crude is an important benchmark which has an API gravity of 38° to 39°. Crude oil is referred to as sweet if it contains less than 0.5% sulphur, or sour if it contains substantial amounts of sulphur. Sweet crude is preferred to sour because it is more suited to the production of the most valuable refined products. Moreover, the geographical location of crude oil production is another main count. In the crude oil market, the two current references or pricing markers are West Texas Intermediate (WTI) and Brent. The former is the base grade traded as 'light sweet crude' on the New York Mercantile Exchange (NYMEX) for delivery at Cushing, Oklahoma. Events around the world can affect prices in India for oil-based energy sources like gasoline and heating oil. Oil prices are volatile due to uncertainty in demand in the developing world (primarily Asia). Political unrest in some oil-producing nations also contributes to high prices as there is a fear that political instability could shut down oil production in these countries. OPEC, the large oil-producing cartel, does have some ability to influence world prices, but OPEC's influence in the world oil market is shrinking rapidly as new supplies in non-OPEC countries are discovered and developed.

CRUDE OIL FACTS

Due to the chemical structure of oil, its long hydrocarbon molecules can be "cracked" or recombined into shorter molecules that have different characteristics. It is because of this property that crude oil can be made into a variety of products, including tar,

CRUDE OIL PRICE MOVEMENT*



Source:MCX | *Near month prices

gasoline, diesel, jet fuel, heating oil, and natural gas. Crude oil can also be found in products such as fertilizer, plastic, synthetic fibres, rubber, petroleum jelly, ink, crayons, bubble gum, dishwashing liquids, and deodorants.

PRICE RISK MANAGEMENT

Risk management techniques are of critical importance for participants, such as producers, exporters, marketers, processors, and SMEs. Modern techniques and strategies, including market-based risk management financial instruments like 'Crude Oil Futures and Options', offered on the recognized and well-regulated platforms, such as MCX, can improve efficiencies and consolidate competitiveness through price risk management. The importance of risk management cannot be overstated; risk management through hedging enables the hedger to mitigate the risks arising from uncertainty and volatility in crude oil prices and focus on their core business activity.

IMPORTANCE OF HEDGING

Hedging is critical for stabilizing incomes of corporations and individuals. Reducing risks may not always improve earnings, but failure to manage risk will have direct repercussion on the risk bearers' long term income.

To gain the most from hedging, it is essential to identify and understand the objectives behind hedging. A good hedging practice, hence, encompasses efforts by companies to get a clear picture of their risk profile and benefit from hedging techniques.

HEDGING MECHANISM

Hedging is the process of reducing or controlling risk. It involves taking equal and opposite positions in two different markets (such as physical and futures or options market), with the objective of reducing or limiting risks associated with price change. It is a two-step process, where a gain or loss in the physical position due to changes in price will be offset by changes in the value on the derivatives platform, thereby reducing or limiting risks associated with unpredictable changes in price. In the international arena, hedging in Crude Oil derivatives takes place on a number of exchanges, the major ones being Chicago Mercantile Exchange (CME), Intercontinental Exchange (ICE), Multi Commodity Exchange of India Ltd. (MCX) and Tokyo Commodity Exchange (TOCOM).

HEDGERS

Commodity derivatives platforms such as MCX offers a transparent platform, besides bringing about economic and financial efficiencies by de-risking production, processing, and trade. Hedging leads to large efficiency gains in supply chains, with exporters gaining a larger share of global prices, and producers getting better prices and much better access to markets. All those who take or intend to have positions in Crude oil are participant hedgers. These are:

- Producers
- Refiners
- Importers
- End Consumers, etc.

FACTORS AFFECTING PRICE VARIATIONS

- Prices ruling in the international markets
- Currency exchange rate movements, especially, the US dollar
- Economic factors: industrial growth, global financial crisis, recession, and inflation
- OPEC announcements
- Weather variability
- Government trade policies (import duties, penalties, and quotas)
- Geopolitical events
- Changes in the refining sector; for example, a drop in the refinery utilisation rate
- US crude and product inventories data

FACTS ON HEDGING

- Understand the risk profile and appetite while formulating clear hedging objectives.
- Hedging can shield the revenue stream, profitability, and balance sheet against adverse price movements.
- Hedging can maximize shareholder value.
- Under 'International Financial Reporting Standards' (IFRS) beneficial options arise for effective hedges.
- Common avoidable mistake is to book profits on the hedge while leaving the physical leg open to risk.
- Hedging provides differentiation to companies in a highly competitive environment.
- Hedging also significantly lowers distress costs in adverse circumstances confronting a company.
- A properly designed hedging strategy enables corporations to reduce risk. Hedging does not eliminate risk; it merely helps to transfer the risk.
- To gain most from hedging it is essential to identify and understand the objectives behind hedging and get a clear picture of the risk profiled hedging and get a clear picture of the risk profile.

A century ago, crude oil was just an obscure commodity; today it is almost as vital as water.



APPRECIATING THE BENEFITS OF HEDGING

Situations prevailing in the crude oil industry are given below, which will demonstrate how MCX platform may be used by participants to manage price risk by entering into Crude Oil Futures contracts. We will look at the effect of price movement in either direction.

THE SITUATION Petstat Oil is involved in the production and sale of crude oil to refiners. Price volatility is of big concern to the company. The management has decided that price risk should be managed by taking up position on MCX.
Hedging against domestic sales
GOING SHORT: Scenarios where prices either rise or fall
The company has monthly production of 12 lakh barrels.

The company has put forward the following:

- The crude oil produced will be sold at the end of the month
- The sale price of crude oil will be as per prevailing price at the time of final sales
- It is difficult to predict the sale price one month ahead
- The company's objective is to lock prices

SCENARIO 1: IF PRICES WERE TO FALL

DETAILS	FUTURES PLATFORM	PHYSICAL MARKET
1st September	SELL Crude oil Futures Contract equal to monthly production	Crude oil being produced for over a month
30th September	BUY Crude oil Futures Contract	Crude oil sold at ruling price

(₹/BBL)

DATE	CRUDE OIL SPOT PRICE	CRUDE OIL FUTURES PRICE (expiry 20th November)
1st September	7,000	7,025
30th September	6,750	6,775

(₹/BBL)

MARKET	DATE	ACTION	PRICE	DATE	ACTION	PRICE	PROFIT/LOSS
Futures	1st September	SELL	7,025	30th September	BUY	6,775	250 (profit)
Spot	30th September			30th September	SELL	6,750	

Net selling price: ₹7,000, i.e. (₹6,750 + ₹250)

EXPLANATION

The Petstat Oil risk management team, short sells 12,000 lots (1 lot = 100 bbl) of 20th November contract on 1st September and squares the contracts on 30th September, making a profit of ₹250 per bbl. The value of crude oil for sale is ₹810 cr. (6,750*12,000*100) and cash inflow from MCX due to fall in prices is ₹30 crore (250*12,000*100). Thus, the net value realized from the sale of crude oil is ₹840 crore (810 crore + 30 crore), making the net selling price ₹7,000 per bbl (840 core /12,00,000 bbl.), which is the budgeted price.

SCENARIO 2: IF PRICES WERE TO RISE

DETAILS	FUTURES PLATFORM	PHYSICAL MARKET
1st September	SELL Crude oil Futures Contract equal to monthly production	Crude oil being produced for over a month
30th September	BUY Crude oil Futures Contract	Crude oil sold at ruling price

(₹/BBL)

DATE	CRUDE OIL SPOT PRICE	CRUDE OIL FUTURES PRICE (expiry 20th November)
1st September	7,000	7,025
30th September	7,250	7,275

(₹/BBL)

MARKET	DATE	ACTION	PRICE	DATE	ACTION	PRICE	PROFIT/LOSS
Futures	1st September	SELL	7,025	30th September	BUY	7,275	250 (loss)
Spot				30th September	SELL	7,250	

Net selling price: ₹7,000, i.e. (₹7,250–₹250)

EXPLANATION

The Petstat Oil risk management team, short sells 12,000 lots (1 lot = 100 bbl) of 20th November contract on 1st September and squares the contracts on 30th September, making a loss of ₹250 per bbl. The value of crude oil for sale is ₹870 core (7,250*12,000*100) and cash outflow from MCX due to rise in prices is ₹30cr. (250*12,000*100). Thus, the net value realized from the sale of crude oil is ₹840 crore(870 crore – 30 crore), making the net selling price ₹7,000 per bbl (840 crore /12,00,000 bbl), which is the budgeted price.

Note: The objective is to lock in prices, to obtain protection from unwanted price volatility, which affects the balance sheet of the company. This has been achieved through hedging on MCX in both the scenario of rising and falling prices, by which Petstat Oil has been able to sell its produce at the budgeted price itself.

THE SITUATION

Swadesh Airlines uses aviation turbine fuel (ATF) to run its fleet, and it buys large quantities of ATF for its monthly consumption owing to which it is exposed to high risk due to highly unpredictable crude oil prices, which is mainly a reflection of international factors.

The company has found a very strong correlation between ATF and light sweet crude. It hedges in MCX crude oil contract so as to cover rise in crude oil derivative prices and effectively manage its commodity risk.

Hedging monthly consumption

GOING LONG: Scenarios where prices either rise or fall

The company hedges monthly usage of ATF of 100,00,000 litres (approximately to 62,900 barrels of crude oil) (Conversion: 1 barrel = 158.98 litres)

SCENARIO 1: IF PRICES WERE TO RISE

DETAILS	FUTURES PLATFORM	PHYSICAL MARKET
1st August	BUY Crude oil Futures Contract (1 contract = 100 bbl)	Spot price of ATF is ₹100 /Litre
31st August	SELL Crude oil Futures Contract	ATF procurement is made at ruling price

DATE	ATF PHYSICAL MARKET PRICE (₹/Litre)	CRUDE OIL FUTURES PRICE (expiry Sept. 20, 202X) (₹/bbl)
1st August	100	6,870
31st August	102	7,000

Note: For easy explanation figures have been rounded up.

DATE	SPOT MARKET	FUTURES MARKET
1st August	Spot price of ATF is ₹100/Litre	BUY MCX Crude oil Sept. 202X contract at ₹6,870/bbl
31st August	ATF bought at price of ₹102/Litre	SELL MCX Crude oil Sept. 202X contract at ₹7,000/bbl
Result		Profit of 160/bbl (7,000 – 6,890) approximately ₹1 per litre

Note: For easy explanation figures have been rounded up.

Net purchase price of ATF is ₹101 /Litre (102 – 1)

EXPLANATION

The company's risk management team, buys 629 lots (1 lot = 100 bbl) of 20th Sept. contract on 1st August and squares the contracts on 31st August, making a profit of ₹160 per bbl. The cash inflow from MCX due to rise in prices is 1 crore (160*629*100) (rounded up). The value of ATF purchased on 8/31/202X is ₹102 cr. (100,00,000 litres * 102/litre). Thus, the net purchase value of ATF is ₹101 cr., making the net purchase price ₹101 / 100,00,000 litres), which is the budgeted price.

SCENARIO 2: IF PRICES WERE TO FALL

DETAILS	FUTURES PLATFORM	PHYSICAL MARKET
1st August	BUY Crude oil Futures Contract (1 contract = 100 bbl)	Spot price of ATF is ₹100 /Litre
31st August	SELL Crude oil Futures Contract	ATF procurement is made at ruling price

DATE	ATF PHYSICAL MARKET PRICE (₹/Litre)	CRUDE OIL FUTURES PRICE (expiry Sept. 20, 202X) (₹/bbl)
1st August	100	6,840
31st August	99	6,680

(Conversion: 1 barrel = 158.98 litres) | Note: For easy explanation figures have been rounded up.

DATE	SPOT MARKET	FUTURES MARKET
1st August	Spot price of ATF is ₹100/Litre	BUY MCX Crude oil Sept. 202X contract at ₹6,840/bbl
31st August	ATF bought at price of ₹99/Litre	Sell MCX Crude oil Sept. 202X contract at ₹6,680/bbl
Result		Loss of 160/bbl (6,840 -6,680) approximately ₹1 per litre

Note: The figures have been rounded up. (Conversion: 1 barrel = 158.98 litres)

EXPLANATION

The company's risk management team, buys 629 lots (1 lot = 100 bbl) of 20th Sept. contract on 1st August and squares the contracts on 31st August, making a loss of ₹160 per bbl. The cash outflow from MCX due to fall in prices is 1crore (160*629*100) (rounded up). The value of ATF purchased on 8/31/202X is ₹99 cr. (100,00,000 litres * 99/litre). Thus, the net purchase value of ATF is ₹100 cr. (99 cr. + 1cr), making the net purchase price ₹100 per litre (100cr. / 100,00,000 litres), which is the budgeted price.

Note: The objective is to lock in price of the fuel to avoid erosion of margins by obtaining protection from unwanted price volatility, which affects the balance sheet of the company. This allows the company to control costs through hedging.

APPRECIATING THE BENEFITS OF HEDGING – using Call options on futures

Crude oil stakeholders, such as risk averse refiners or sellers of petroleum derivatives, on entering into an agreement with customers, often face the risk of an unexpected rise in crude oil price when they would procure crude oil for processing. This risk cannot be passed on to the customers. By buying a call option, they can hedge against such a risk, as the following example shows.

THE SITUATION

On August 25, the spot price of Crude oil is ₹7,780 per barrel. Pestat Oil has received an order for a petroleum derivative, equivalent to 100 barrel of crude oil, to be delivered by 1st week of October, for which the selling price has been fixed based on current spot prices. The company wants to procure physical crude oil only in the last week of September due warehousing and logistics issues.

However, the company faces the risk of a rise in price of crude oil in the near future. To hedge against the expected price increase, company buys Crude oil Call Option on future expiring on September 19, at the strike price of ₹7,800 per barrel for a premium of ₹30. The underlying to this option contract is Crude oil October futures contract trading at ₹7,800 per barrel.

The following two scenarios are possible at options expiry:



SCENARIO 1: IF CRUDE OIL PRICES WERE TO RISE

Price & Action	Crude oil Spot Prices (₹/ barrel)	Crude oil Sep Futures Prices (₹/barrel)	Crude oil Sept. CALL options (Underlying: Crude oil Oct. Futures Contract)	CALL Option Premium (₹)
Traded Price on August 25	7,780	7,800	7,800 (strike price)	Out:30
Action on August 25	-	-	Buy Call option contract by paying premium	
Position in market	Nil	Nil	Long 1 lot	
Close Price on September 19 (Option expiry day)	7,940	7,950	7,800 (strike price)	150
Action on September 19 after close of market hours	-	On exercise, the call options contract will devolve into a long position in the underlying crude oil futures contract at ₹7,800 (strike price)		
Position on September 19 post-devolvement	-	Long 1 lot	Nil	-
Traded Price on September 20	7,990	8,000	-	-
Action on September 20	Buy in physical market	Sell the long open futures position		-
Flow of money	Out: 7,990	In: 200 (8,000 – 7,800)	-	Out: 30

Thus, the net purchase price of crude oil on September 20 is ₹7,990 (Physical market purchase) – ₹200 (gains in futures market on devolvement of options position) + ₹30 (option premium paid) = ₹7,820 per barrel, which is close to spot prices prevailing on August 25. Thus, by buying a 'Call' Option on future and allowing it to devolve into futures position on expiry, the company was able to protect its business margins, in the event of a rise in prices.



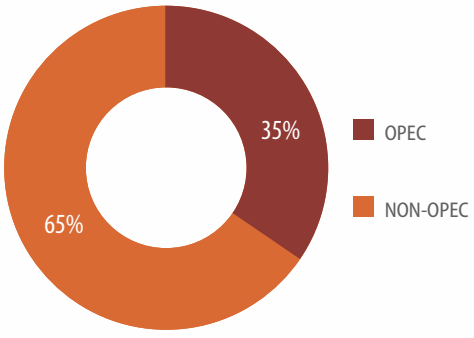
SCENARIO 2: IF CRUDE OIL PRICES WERE TO FALL

Price & Action	Crude oil Spot Prices (₹/ barrel)	Crude oil Oct Futures Prices (₹/barrel)	Crude oil Sept. CALL options (Underlying: Crude oil Oct. Futures Contract)	CALL Option Premium (₹)
Traded Price on August 25	7,780	7,800	7,800 (strike price)	Out:30
Action on the August 25	-	-	Buy Call option contract by paying premium	
Position in market	Nil	Nil	Long 1 lot	-
Close Price on September 19 (Option expiry day)	7,640	7,650	7,800 (strike price)	0
Action on September 19 after close of market hours	-	As strike price of the Call option contract is more than the underlying futures prices, it expires worthless.		
Position on September 19 post - devolvement	-	-	-	-
Traded Price on September 20	7,630	-	-	-
Action on September 20	Buy in physical market	-	-	-
Flow of money	Out: 7,630	-	-	Out: 30

Net purchase price of crude oil on September 20 is ₹7,630 (Physical market purchase) + ₹30 (option premium paid) = ₹7,660 per barrel, much less than the spot prices prevailing on August 25.

Thus, by hedging risk of rise in crude oil prices using a Crude oil Call Options Contract, a refiner would just not be protected against price rise but would also benefit from fall in crude oil prices, if any, in form of lower net purchase price.

OPEC % share of global supply



Source: OPEC



APPRECIATING THE BENEFITS OF HEDGING – using Put options on futures

Crude oil market stakeholders often store the commodity before processing and selling to prospective customers. They, therefore, face the risk of a fall in crude prices. By buying a put option, they can hedge against such a risk, as the following example shows.

THE SITUATION

On October 21, the spot price of Crude oil is ₹7,890 per barrel. Pestat Oil procured 100 barrel of crude oil at spot price for an order in hand. Unfortunately, the prospective buyer cancelled the order. However, Petsat Oil received another order for 100 barrel of crude oil, to be delivered by last week of November, at the then prevailing crude oil price.

As a result, the company faces the risk of fall in price of crude oil in the near future. To hedge against this risk of fall in price, the company buys Put Option on Crude oil futures, the Option expiring on November 19, at the strike price of ₹7,900 per barrel for a premium of ₹30. The underlying to this option contract is Crude oil November futures contract trading at ₹7,900 per barrel.

Following two scenarios are possible at options expiry:



SCENARIO 1: IF CRUDE OIL PRICES WERE TO FALL

Price & Action	Crude oil Spot Prices (₹/ barrel)	Crude oil Nov. Futures Prices (₹/barrel)	Crude oil Nov. PUT options (Underlying: Crude oil Nov. Futures Contract)	PUT Option Premium (₹)
Traded Price on October 21	7,890	7,900	7,900 (strike price)	Out:30
Action on October 21	-	-	Buy Put option contract by paying premium	
Position in market	Nil	Nil	Long 1 lot	-
Close Price on November 19 (Option expiry day)	7,740	7,750	7,900 (strike price)	150
Action on November 19 after close of market hours	-	On exercise, the put options contract will devolve into a short position in the underlying crude oil futures contract at ₹7,900 (strike price)		
Position on November 19 post-devolvement		Short 1 lot	Nil	-
Traded Price on November 20	7,690	7,700	-	-
Action on November 20	Sell in physical market	Buy, to Square off the short open futures position	-	-
Flow of money	In: 7,690	In: 200 (7,900 – 7,700)	-	Out: 30

Thus, the net sale price of crude oil on November 20 is ₹7,690 (Physical market sale) + ₹200 (gains in futures market on devolvement of options position) - ₹30 (option premium paid) = ₹7,860 per barrel, which is close to spot prices prevailing on October 21.

Thus, by buying a 'Put' Option and allowing it to devolve into futures position on expiry of the Options contract, Pestat Oil is able to 'lock in' a price and protect his business margins, in the event of a fall in prices.



SCENARIO 2: IF CRUDE OIL PRICES WERE TO RISE

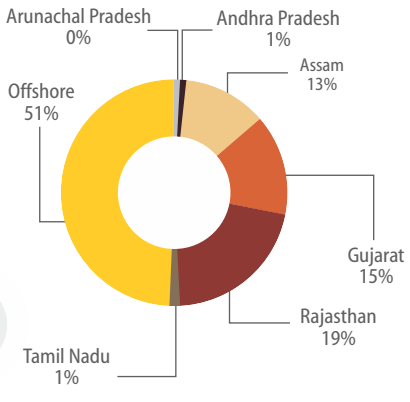
Price & Action	Crude oil Spot Prices (₹/ barrel)	Crude oil Nov. Futures Prices (₹/barrel)	Crude oil Nov. PUT options (Underlying: Crude oil Nov. Futures Contract)	PUT Option Premium (₹)
Traded Price on October 21	7,890	7,900	7,900 (strike price)	Out:30
Action on October 21	-	-	Buy Put option contract by paying premium	
Position in market	Nil	Nil	Long 1 lot	
Close Price on November 19 (Option expiry day)	8,040	8,050	7,900 (strike price)	0
Action on November 19 after close of market hours	-	As strike price of the Put option contract is less than the underlying futures prices, it expires worthless.		
Position on November 19 post-devolvement		Nil	Nil	-
Traded Price on November 20	8,050	-	-	-
Action on November 20	Sell in the physical market	-	-	-
Flow of money	In: 8,050	-	-	Out: 30

Thus, the net sale price of crude oil on November 20 is ₹8,050 (Physical market sale) – ₹30 (option premium paid) = ₹8,020 per barrel, which is much more than the spot prices prevailing on October 21.

Thus, by hedging the risk of fall in crude oil prices using a Crude oil Put Options Contract, Pestat Oil would not just be protected against the risk of price fall, but would also benefit from rise in crude oil prices, if any, in form of higher net sale price.

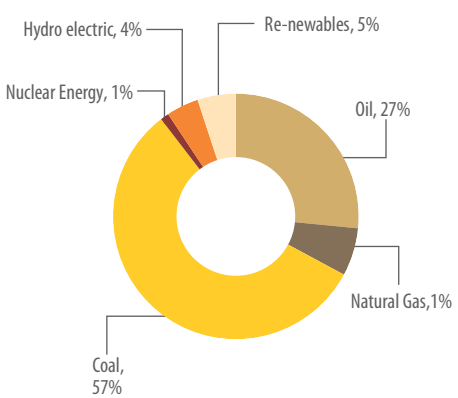


India Crude Oil production by region, 2020-21



Source: MOPNG | *upto Dec '19

Total Energy Consumption in India, 2021

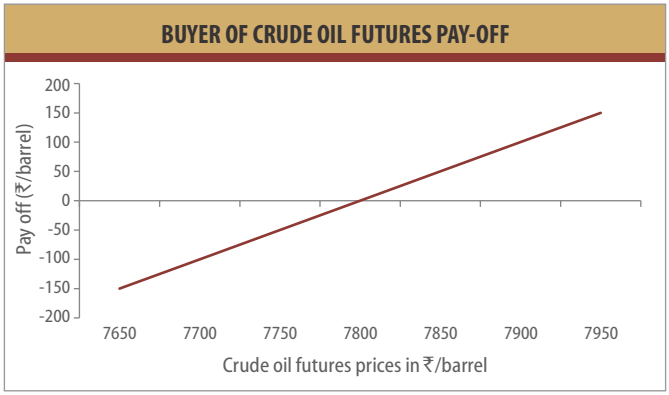


Source : British Petroleum Statistics 2022

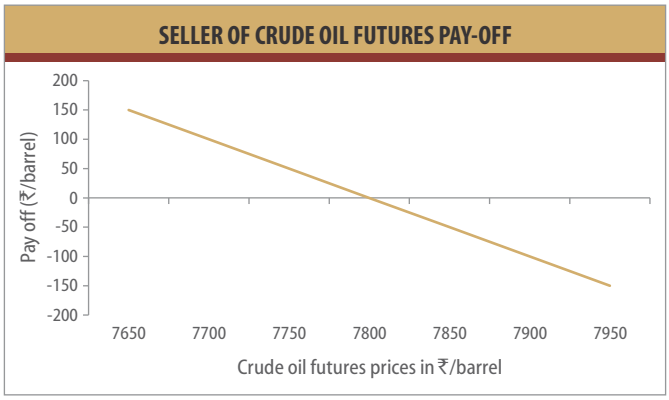
FUTURES AND OPTIONS PAYOFFS

A. Commodity Futures

1. Assume a market participant buys a crude oil futures contract at ₹7,800 per barrel. His pay-off on his futures position with change in crude oil futures prices is as shown below.

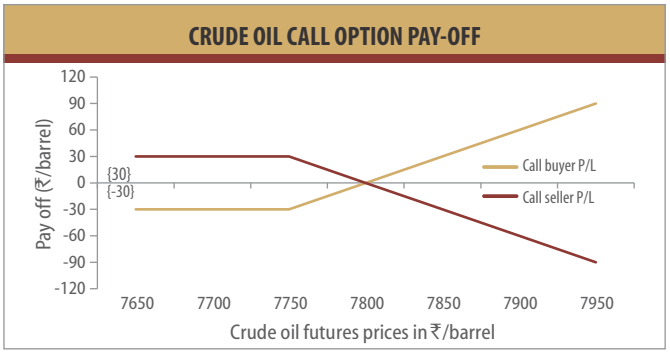


2. Assume a market participant sells a crude oil futures contract at ₹7,800 per barrel. His pay-off on his futures position with change in crude oil futures prices is as shown below.

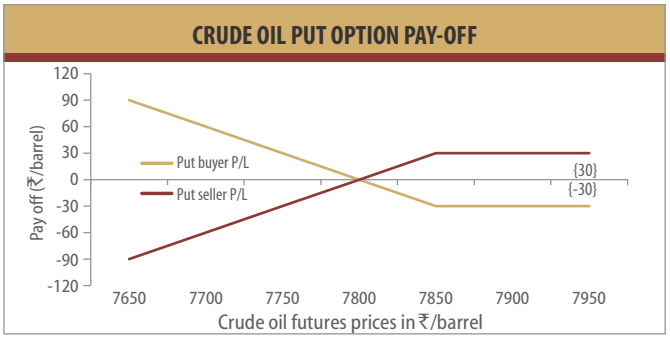


B. Commodity Options on Futures

3. Assume a market participant buys a crude oil call option contract with a strike price at ₹7,800 per barrel at a premium of ₹30. His pay-off on his call option contract with change in the underlying crude oil futures prices is as shown below. Pay-off for call option seller is also shown in same figure.

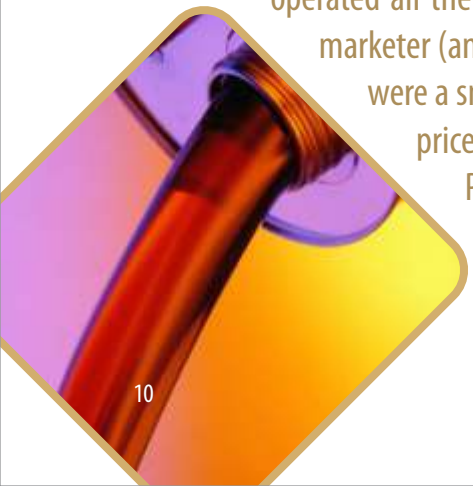


4. Assume a market participant buys a crude oil put option contract with a strike price at ₹7,800 per barrel and premium at ₹30. His pay-off on his put option contract with change in the underlying crude oil futures prices is as shown below. Pay-off for put option seller is also shown in same figure.



During the period up to 1970 (and even beyond), the "market" for crude oil was largely characterized by within-company exchanges. Most oil companies were "vertically integrated," that is, the company operated all the way down the value chain; crude oil would go from the field to the refiner to the marketer (and then to the retailer, like a gas station) while staying within company borders. There were a small number of market transactions at what was referred to as "posted prices." Posted prices are essentially fixed offer prices posted by companies in advance of transactions. Posted prices were originally painted on wooden signs and hung on posts (hence the name), each remaining in effect until it was replaced by a new one. Now, posted prices are electronic bulletins issued by major oil producers.

Source: DSJS Jones, Dept of Energy and Mineral engineering, Wikipedia



HEDGING EXPERIENCES

1. BP

The group uses derivative financial instruments to manage certain exposures to fluctuations in foreign currency exchange rates, interest rates and commodity prices, as well as for trading purposes. Contracts to buy or sell a non-financial item (for example, oil, oil products, gas or power) that can be settled net in cash, with the exception of contracts that were entered into and continue to be held for the purpose of the receipt or delivery of a non-financial item in accordance with the group's expected purchase, sale or usage requirements, are accounted for as financial instruments. Gains or losses arising from changes in the fair value of derivatives that are not designated as effective hedging instruments are recognized in the income statement. (Source: Annual Report FY18)

2. Larsen & Toubro

The various businesses of the Company are exposed to fluctuations in foreign exchange rates and commodity prices. Additionally, it has exposures to foreign currency denominated financial assets and liabilities. The business related financial risks, especially involving commodity prices, by and large, are managed contractually through price variation clauses, while the foreign exchange and residual commodity price risks are managed by an appropriate choice of treasury products for balancing risks and at the same time optimising the hedging costs. (Source: Annual Report FY18)

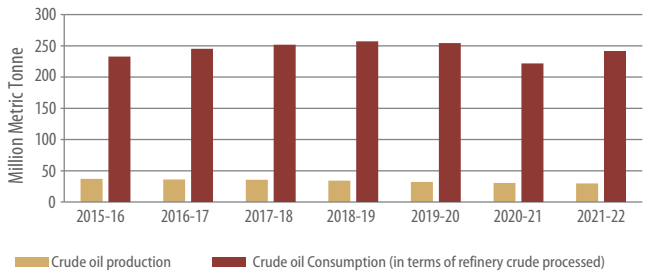
3. BPCL

In order to protect BPCL from adverse price movements, the commodity derivatives team in ITRM follows a Committee based, structured approach to carry out commodity hedging activities by hedging price risks in the international market through various instruments of hedging. Commodity hedging activities carried out during the year 2017-18 were within the approved mandate, in compliance of regulatory guidelines and resulted in hedging objectives being fully achieved. (Source: Annual Report FY18)

4. IOCL

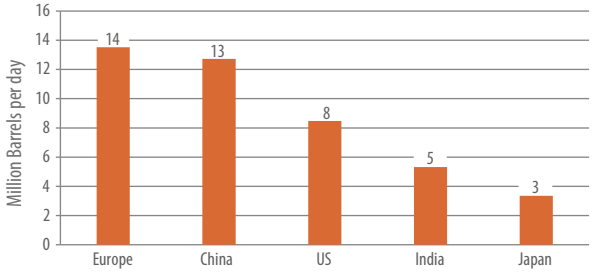
In order to mitigate oil price risk, Indian Oil has policy in place to undertake risk management activities through refining margin hedging, inventory hedging and crude oil price hedging depending upon the market conditions. The market is closely monitored on a regular basis and mitigation strategies are adopted in line with the risk management policy. The Company manages its foreign currency risk through combination of natural hedge, mandatory hedge, mandatory hedging and hedging undertaken on occurrence of pre-determined triggers. The hedging is mostly done through forward contracts. (Source: Annual Report FY18)

Indian Crude Oil Production and Consumption



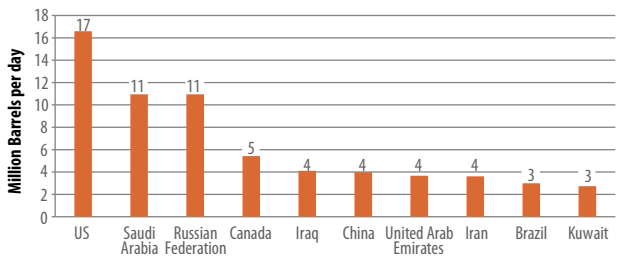
Source : Petroleum Planning and Analysis Cell (PPAC)

Top Five Importers of Crude Oil, 2021



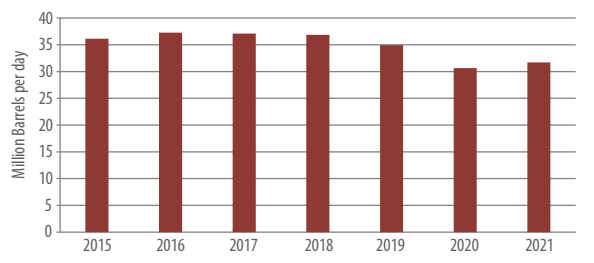
Source : British Petroleum Statistics 2021

World Crude oil Production in 2021



Source: British Petroleum Statistics 2022

OPEC crude oil production



Source: British Petroleum Statistics 2022

REGULATORY BOOSTS FOR HEDGERS

1. Income tax exemptions for hedging: Commodity derivatives transactions undertaken in recognized exchanges enjoy benefits under the ambit of Section 43(5) of the Income Tax Act, 1961 and the gains/ losses from such transactions are not considered 'speculative'.

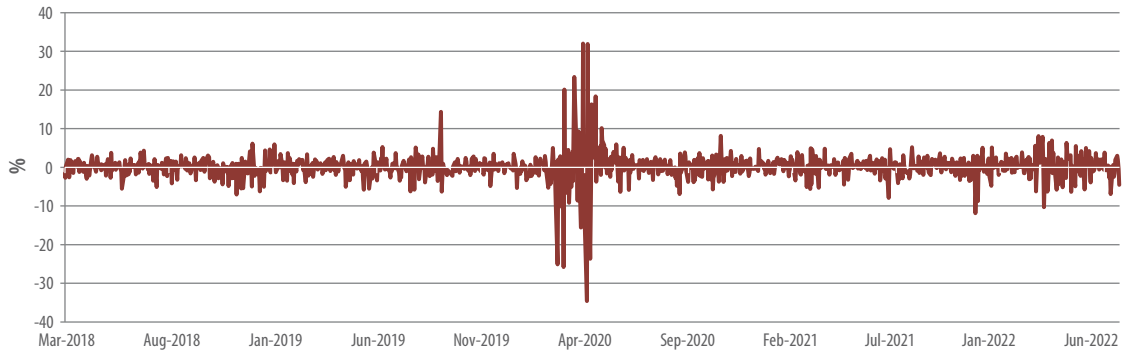
   This effectively means that business profits/ losses can be offset by losses profits undertaken in commodity derivatives transactions. This enhances the attractiveness of risk management on recognized commodity derivative exchanges and incentivizes hedging. Hedgers are no longer forced to undertake physical delivery of commodities in order to prove that their transactions are in the nature of hedging and not 'speculation'.

2. Limit on open position as against hedging: This enables hedgers to take positions to the extent of their exposure on the physical market and are allowed to take position over and above prescribed position limits on approval by the exchange.

A comprehensive Hedge Policy Document is available at https://www.mcxindia.com/docs/default-source/market-operations/trading-surveillance/reports/hedgepolicy.pdf?sfvrsn=2

AVERAGE DAILY VOLATILITY OF CRUDE OIL PRICES*

* MCX crude oil futures near month prices



YEAR	2015	2016	2017	2018	2019	2020	2021
ANNUALIZED VOLATILITY	42%	44%	24%	31%	34%	94%	35%

HOW MUCH VOLATILITY RISK ARE YOU EXPOSED TO?

Crude oil witnessed annualized price volatility of 35% in 2021.

This means a firm in the crude oil business, with an annual turnover of ₹100 crore, was exposed to a price risk of ₹35 crore in 2021.

India, the third largest energy consumer in the world with an annual crude market size of 1887 million barrels, worth about ₹7.34 lakh crore, is exposed to price risk of ₹2.56 lakh crore (that is, 35% of the holding value) because of price volatility.

ARE YOU PREPARED FOR VOLATILITY RISK?

Adoption of a risk management practice, such as hedging on the commodity derivatives platform can help shield against the perils of price volatility.

VOLATILITY IN CRUDE OIL

Commodity price volatility act as a source of risk to commodities-related business, as it instills a degree of uncertainty over the actual finances involved in the business.

According to the Washington-based Corporate Executive Board's survey, of the top 10 risks faced by corporate participants, commodity price risk was pronounced as number one.



In the oil industry, the size of the price holds more importance than the risk in it.

SALIENT SPECIFICATIONS OF MCX CRUDE OIL FUTURES CONTRACTS

SYMBOL	**CRUDEOIL**
Description	CRUDEOILMMMYY
No. of contracts a year	12
Contract duration	6 months
TRADING	
Trading period	Mondays through Fridays
Trading session	Monday to Friday: 9:00 a.m. to 11:30 p.m. / 11:55* p.m.
Trading unit	100 barrels
Quotation/Base value	₹ / barrel
Maximum order size	10,000 barrels
Tick size (minimum)	₹ 1
Daily price limits	The Exchange has implemented a narrower slab of 4%. Whenever the narrower slab is breached, the relaxation will be allowed up to 6% without any cooling off period in the trade. In case the daily price limit of 6% is also breached, then after a cooling off period of 15 minutes, the daily price limit will be relaxed upto 9%. In case price movement in international markets is more than the maximum daily price limit (currently 9%), the same may be further relaxed in steps of 3% and will be informed to the Regulator immediately.
Initial margin	Minimum 10% or based on SPAN, whichever is higher
Extreme Loss Margin	Minimum 1%
Additional and/or special margin	In case of additional volatility, an additional margin (on both buy side and sell side) and / or special margin (on either buy side or sell side) at such percentage, as deemed fit, will be imposed in respect of all outstanding positions.
Maximum allowable open position**	For individual clients: 4,80,000 barrels or 5% of the market wide open position, whichever is higher for all Crude Oil contracts combined together. For a member collectively for all clients: 48,00,000 barrels or 20% of the market wide open position, whichever is higher for all Crude Oil contracts combined together.
Due Date Rate:	Due date rate shall be the settlement price, in Indian rupees, of the New York Mercantile Exchange's (NYMEX)# Crude Oil (CL) front month contract on the last trading day of the MCX Crude Oil contract. The last available RBI USDINR reference rate will be used for the conversion. The price so arrived will be rounded off to the nearest tick. For example, on the day of expiry, if NYMEX Crude Oil (CL) front month contract settlement price is $40.54 and the last available RBI USDINR reference rate is 66.1105, then DDR for MCX Crude oil contract would be ₹2680 per barrel (i.e. $40.54 * 66.1105 and rounded off to the nearest tick).
Settlement Mechanism:	The contract would be settled in cash

#A market division of Chicago Mercantile Exchange Inc. ("CME Group")

Note: Please refer to the exchange circulars for latest contract specifications.

* Based on US daylight saving time period.

** Genuine hedgers having underlying exposure that exceed the prescribed OI limits given in the contract specifications can be allowed higher limits based on approvals

SALIENT FEATURES OF MCX CRUDE OIL OPTIONS CONTRACT

Symbol	CRUDEOIL
Underlying	Underlying shall be Crude Oil Futures contract traded on MCX
Description	Option on Crude Oil Futures | **Options type:** European Call & Put Options
Expiry Day (Last Trading Day)	Two business days prior to the Expiry day of the underlying futures contract
Trading Period	Monday through Friday (9.00 a.m. to 11.30 / 11.55 p.m.[#])
Trading Unit	One MCX Crude Oil futures contract
Underlying Quotation/ Base Value	Rs. Per barrel
Strikes	40 In-the-money, 40 Out-of-the-money and 1 Near-the money (81 CE and 81 PE). The Exchange, at its discretion, may introduce additional strikes, if required.
Strike Price Intervals	₹50 | **Tick Size (Minimum Price Movement):** ₹0.10
Daily Price Limit	The upper and lower price band shall be determined based on statistical method using Black76 option pricing model and relaxed considering the movement in the underlying futures contract. In the event of freezing of price ranges even without a corresponding price relaxation in underlying futures, if deemed necessary, considering the volatility and other factors in the option contract, the Daily Price Limit shall be relaxed by the Exchange.
Margins	The Initial Margin shall be computed using SPAN (Standard Portfolio Analysis of Risk) software, which is a portfolio based margining system. To begin with, the various risk parameters shall be as under: A. Price Scan Range – 3.5 Standard Deviation (3.5 sigma) B. Volatility Scan Range – Minimum 5% or as decided by MCXCCL from time to time. For applicable VSR refer latest circulars issued by MCXCCL. C. The Short Option Minimum Margin (SOMM) and Margin Period of Risk (MPOR) shall be in accordance with SEBI Circular no. SEBI/HO/CDMRD/DRMP/CIR/P/2020/15 dated January 27, 2020. For applicable SOMM and MPOR refer latest circulars issued by MCXCCL from time to time. D. Extreme Loss Margin – Minimum 1% (to be levied only on short option positions) E. Premium of buyer shall be blocked upfront on real time basis. F. For Additional Margin refer latest circulars issued by MCXCCL from time to time.
Premium	Premium of buyer shall be blocked upfront on real time basis.
Margining at client level	Initial Margins shall be computed at the level of portfolio of individual clients comprising of the positions in futures and options contracts on each commodity
Maximum Allowable Open Position	Position limits for options would be separate from the position limits applicable on futures contracts. For individual clients: 9,60,000 barrels or 5% of the market wide open position, whichever is higher for all Crude Oil Options contracts combined together. For a member collectively for all clients: 96,00,000 barrels or 20% of the market wide open position, whichever is higher for all Crude Oil Options contracts combined together. Upon expiry of the options contract, after devolvement of options position into corresponding futures positions, open positions may exceed their permissible position limits applicable for future contracts. Such excess positions shall have to be reduced to the permissible position limits of futures contracts within two trading days.
Exercise Mechanism at expiry	All In the money (ITM)# option contracts shall be exercised automatically, unless 'contrary instruction' has been given by long position holders of such contracts for not doing so. The ITM option contract holders, who have not submitted contrary instructions, shall receive the difference between the Settlement Price and Strike Price in Cash as per the settlement schedule. In the event contrary instruction are given by ITM option position holders, the positions shall expire worthless. All Out of the money (OTM) option contracts shall expire worthless. All devolved futures positions shall be considered to be opened at the strike price of the exercised options. All exercised contracts within an option series shall be assigned to short positions in that series in a fair and non-preferential manner. #ITM for call option = Strike Price < Settlement Price | ITM for put option = Strike Price > Settlement Price
Due Date Rate (Final Settlement Price)	Daily settlement price of underlying futures contract on the expiry day of options contract.

* Option series having strike price closest to the Daily Settlement Price (DSP) of Futures shall be termed as At the Money (ATM) option series. This ATM option series along with two option series each having strike prices immediately above and below ATM shall be referred as 'Close to the money' (CTM) option series. In case the DSP is exactly midway between two strike prices, then immediate two option series having strike prices just above DSP and immediate two option series having strike prices just below DSP shall be referred as 'Close to the money' (CTM) option series. | # based on US daylight saving time period.

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