









NATURAL GAS
HEDGING PRICE RISK

MCX METAL & ENERGY
Trade with Trust

MCX INVESTOR PROTECTION FUND

OVERVIEW

Natural gas is a colourless, odourless, environment-friendly energy source. It is cleanest of all the fuels that are traditionally being used in India. Natural gas is a highly flammable hydrocarbon gas chiefly consisting of methane (CH4). It may also include other gases such as oxygen, hydrogen, nitrogen, ethane, ethylene, propane, and even some helium.

Natural gas, converted into a liquid state by cooling it to –161°C, is termed as LNG. LNG is more compact than natural gas and occupies 1/600th of its gaseous volume. Natural gas, when compressed at a pressure of 250 bars, is termed as compressed natural gas (CNG). Since natural gas is not a pure product, when non-associated gas is extracted from a field under superficial conditions, it may partially condense upon isothermic depressurizing – an effect called retrograde condensation.

Natural gas is simply referred to as gas, especially when compared to other energy sources like electricity. Before natural gas can be used, it must undergo processing to remove all materials except methane. Natural gas is used mainly in the industrial, commercial, transportation, and household sectors. The power and fertilizer sectors are the largest consumers of natural gas.

COMMERCIAL APPLICATIONS

Burning natural gas is relatively clean, as it produces about 30% to 40% of less carbon dioxide than petroleum and coal. Natural gas is primarily used in homes, businesses, and factories for heating, cooking, and cooling. It is increasingly being used as a source of energy for generating electricity through gas turbines and steam turbines. CNG is commonly being used as a fuel for public transport vehicles. In addition, natural gas is used as a base ingredient in the manufacturing of ammonia, anti-freeze, fabrics, glass, steel, plastics, and paint

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 'Natural Gas Futures', 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 natural gas prices and focus on their core business activity.

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 natural gas derivatives takes place on a number of exchanges, the major ones being Chicago Mercantile Exchange (CME) and Intercontinental Exchange (ICE).

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.

PARTICIPANT 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 natural gas are participant hedgers. These are:

- Producers
- Importers
- Distributors

FACTORS IMPACTING NATURAL GAS PRICE

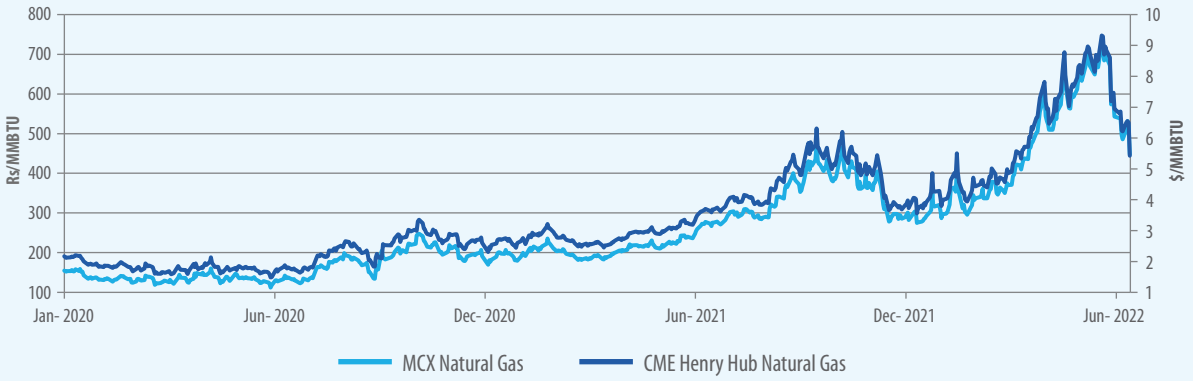
- Natural gas inventory data
- US weather conditions and active hurricane season poses a threat to US Gulf Coast's
- Natural gas production
- Price of crude oil
- Industrial and residential demand in the U.S.

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.

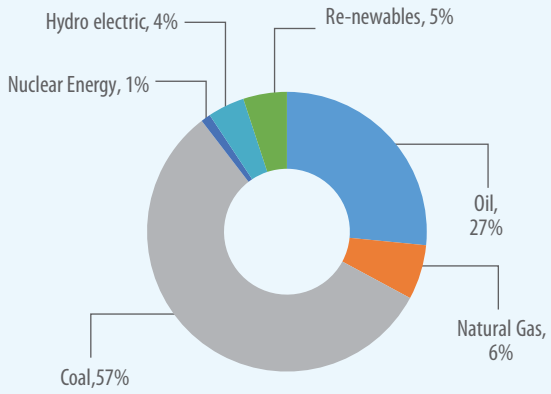
A comprehensive Hedge Policy Document is available at:
https://www.mcxindia.com/docs/default-source/market-operations/trading-surveillance/reports/hedgepolicy.pdf?sfvrsn=2

Natural Gas: Price Movement



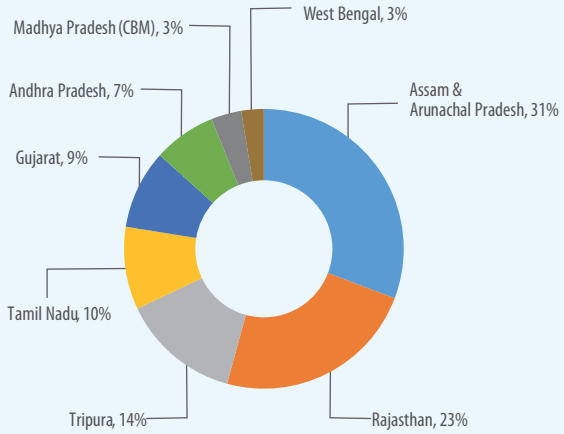
Source: MCX & CME

Energy Usage in India (by fuel type) - 2021



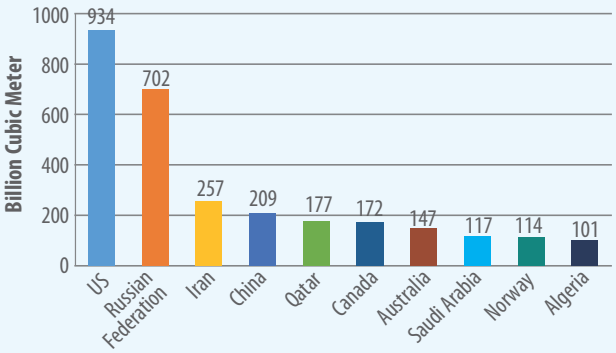
Source: British Petroleum statistics - 2022

India Natural Gas Production (by Region), 2021-22



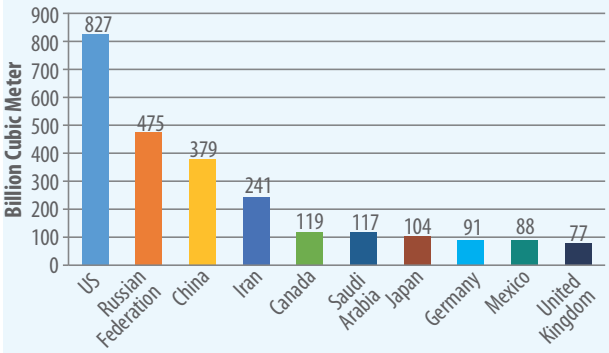
Source : PPAC - 2022

Global Production - 2021



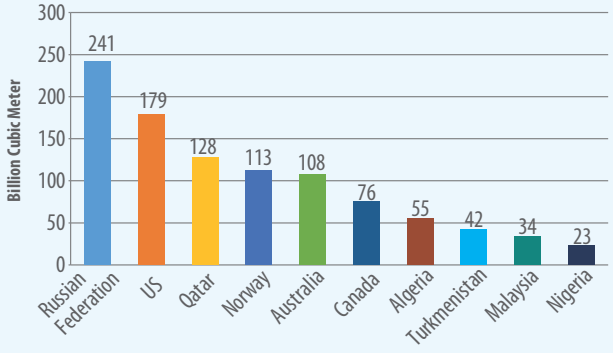
Source: British Petroleum statistics - 2022

Global Consumption - 2021



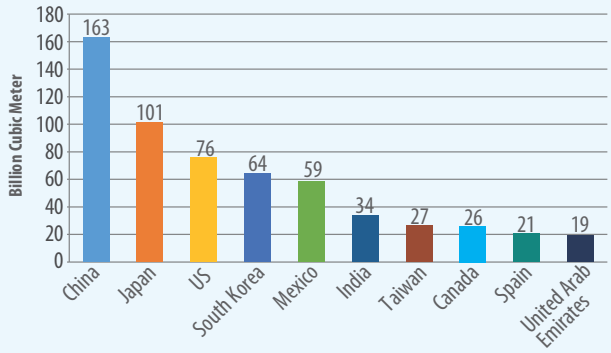
Source: British Petroleum statistics - 2022

Top Exporting Countries - 2021



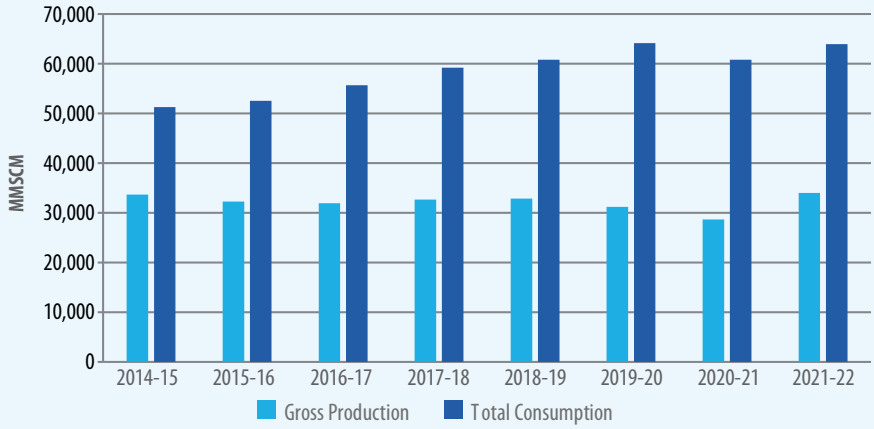
Source: British Petroleum statistics 2022

Top Importing Countries -2021



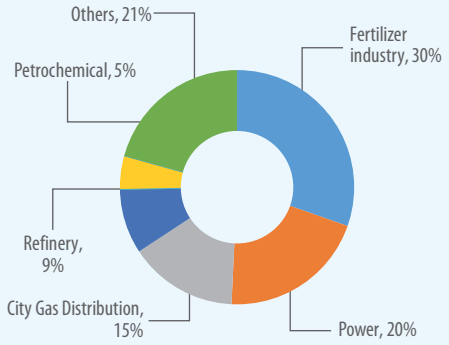
Source: British Petroleum statistics 2022

Natural Gas Production and Consumption in India



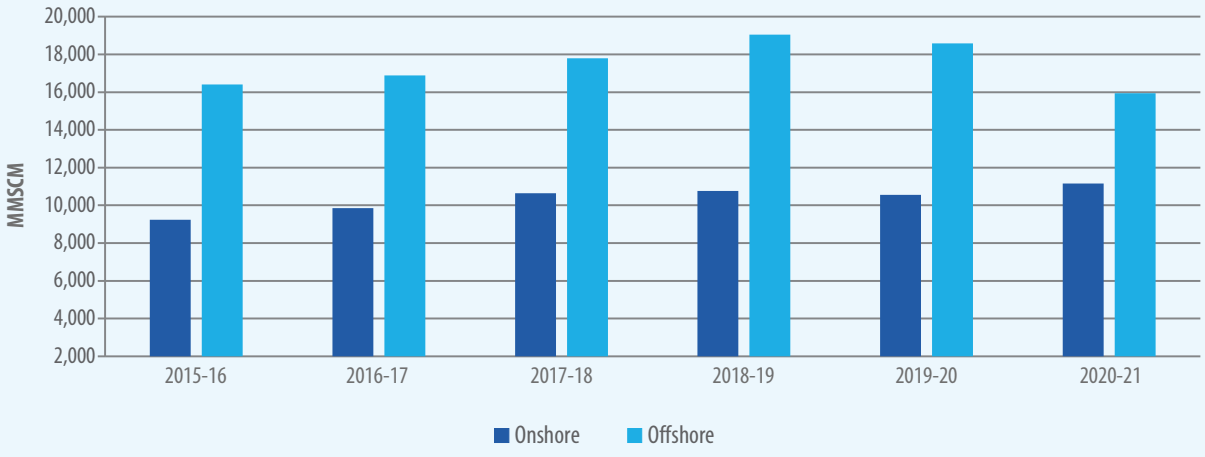
Source : Petroleum Planning & Analysis Cell | MMSCM- Million Metric Standard Cubic Meter

Industry wise consumption of natural gas in India during FY 2021-2022



Source : Petroleum Planning & Analysis Cell

Offshore and Onshore Gas Production



Source: Petroleum Planning & Analysis Cell | MMSCM: Million Metric Standard Cubic Meter

APPRECIATING THE BENEFITS OF HEDGING

Situations prevailing in the natural gas industry are given below, which will demonstrate how commodity exchange platform may be used by participants to manage price risk by entering into natural gas futures contracts. We will look at the impact of price movement in either direction.

THE SITUATION

ASK Ltd. manufactures ammonia, using natural gas as its base ingredient. Natural gas being the base ingredient has a direct bearing on the pricing of the final product. Hence, price volatility of natural gas is a big concern to the company. A consultant appointed by the management has recommended that price risk should be managed by taking up position on the futures market.

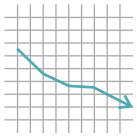
On 20th November, the company received an order for ammonia to be delivered on 20th December. Company would require 1250 mmbtu of natural gas to prepare the order. Also, as per the contract, payment will be received on the date of delivery, at the prevailing market price. Based on experience, the company has put forward the following facts:

The company faces the risk of fall in natural gas price between the time of procuring natural gas and selling the finished goods. It is, thus, seeking to manage this risk by locking in prices.

HEDGING ILLUSTRATIONS

Example 1:

If prices were to fall



DATE	NATURAL GAS SPOT MARKET	NATURAL GAS FUTURES PRICE (expiry 25th December 202X)
20-11-202X	400	402
20-12-202X	395	398

Futures	20-11-202X	SELL	402	20-12-202X	BUY	398	**6 (gain)**
Spot	20-11-202X		400	20-12-202X	SELL	395	**5 (potential loss)**

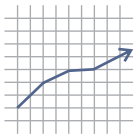
Net selling price: ₹401 (₹395 + ₹6)

EXPLANATION

The Treasury Team of the company, short sells 1 lot of 25th December 202X contract on 20th November and squares the contract on 20th December. The value of natural gas in the finished goods sale is ₹400 per mmbtu and cash inflow from futures market due to fall in prices is ₹6 per mmbtu. Thus, the net value realized from the sale of finished goods is 401 (395+6) per mmbtu.

Example 2:

If prices were to rise



DATE	NATURAL GAS SPOT MARKET	NATURAL GAS FUTURES PRICE (expiry 25th December 202X)
20-11-202X	400	402
20-12-202X	406	407

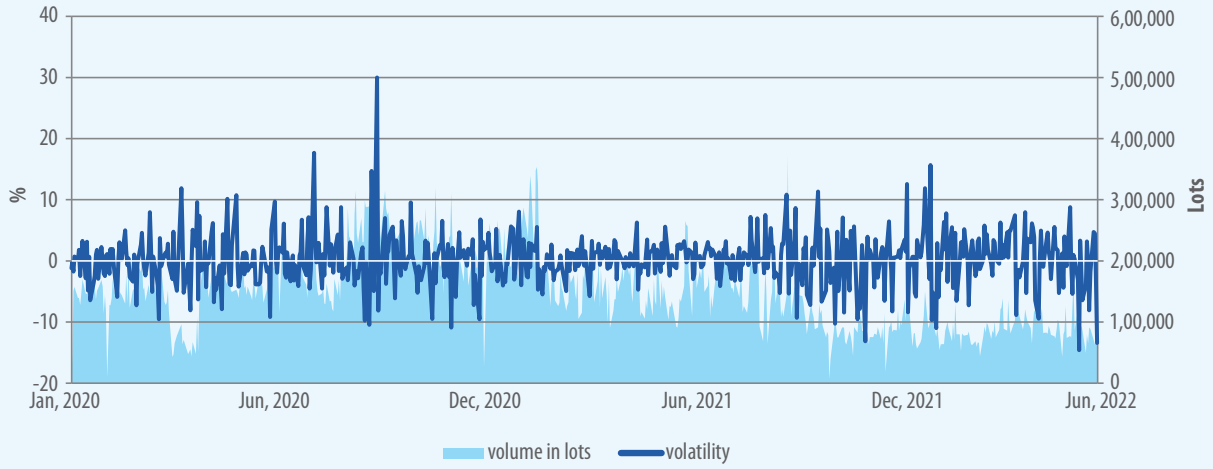
Futures	20-11-202X	SELL	402	20-12-202X	BUY	407	**5 (loss)**
Spot	20-11-202X		400	20-12-202X	SELL	406	

Net selling price: ₹401 (₹406 – ₹5)

EXPLANATION

The Treasury Team of the Company, short sells 1 lot of 25th December 202X contract on 20th November and squares the contracts on 20th December, making a loss of ₹5 per mmbtu. The value of raw material in the finished goods sale is ₹406 per mmbtu on 20th December and cash flow outgo in futures market due to rise in prices is ₹5 per mmbtu. Thus, the net value realized from the sale of finished goods is ₹401 (406-5) per mmbtu.

Daily Average Volatility of Natural Gas*



YEAR	2014	2015	2016	2017	2018	2019	2020	2021
ANNUALIZED VOLATILITY	40%	43%	41%	36%	48%	39%	67%	55%

How much Volatility Risk are You Exposed to?



Natural Gas witnessed annualized price volatility of 55% in 2021.

This means a firm in the natural gas business, with an annual turnover of ₹100 crore, was exposed to a price risk of ₹55 crore in 2021.

India, the fourth largest energy consumer in the world with an annual natural gas market size of approximately 25,813 lakh mmbtu, worth about ₹42,076 crores, is exposed to price risk of ₹23,142 crores (i.e. 55% of the holding value) because of price volatility.

ARE YOU PREPARED FOR VOLATILITY RISK?

(Adoption of a risk management practice, such as hedging on a futures Platform can help shield against the perils of price volatility)

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.



SALIENT SPECIFICATIONS OF NATURAL GAS FUTURES CONTRACTS

Symbol	**NATURALGAS**
Description	NATURALGASMMMYY
Contract Listing	Contracts are available as per the Contract Launch Calendar.
Contract Start Day	As per the Contract Launch Calendar.
Last Trading Day	As per the Contract Launch Calendar.
Contract Duration	Maximum of 3 months, at any point of time 3 calendar months will be available for trading.
Trading Period	Mondays through Fridays
Trading Session	Mondays through Fridays: 09.00 am to 11.30/ 11.55 pm (based on US daylight saving time period.)
Trading Unit	1250 mmBtu
Quotation/ Base Value	₹ per mmBtu
Maximum Order Size	60,000 mmBtu
Tick Size (minimum price movement)	10 paise (0.10 rupees)
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 & sell side) and/ or special margin (on either buy or sell side) at such percentage, as deemed fit, will be imposed in respect of all outstanding positions.
Maximum Allowable Open Position	For individual client: 60,00,000 mmBtu or 5% of the market wide open position, whichever is higher. For a member collectively for all clients: 6,00,00,000 mmBtu or 20% of the market wide open position, whichever is higher.
Quality Specifications	Natural Gas meeting the specifications set forth in the FERC approved tariff of Sabine Pipe Line Company.
Due Date Rate (Final Settlement Price)	Due date rate shall be the settlement price, in Indian rupees, of the NYMEX# Natural Gas (NG) front month contract on the last trading day of the MCX Natural Gas 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 Natural Gas (NG) front month contract settlement price is $2.260 per mmBtu and the last available RBI USDINR reference rate is 66.1105, then DDR for MCX Natural Gas contract would be ₹149.40 per mmBtu (i.e. $2.260 * 66.1105 and rounded off to the nearest tick.)
Settlement Mechanism	The contract would be settled in cash

Note

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

SALIENT SPECIFICATIONS OF NATURAL GAS OPTIONS CONTRACTS

Symbol	**NATURALGAS**		
Underlying	Underlying shall be Natural Gas Futures contract traded on MCX		
Description	Option on Natural Gas Futures		
Option Type	European Call & Put Options		
Expiry Day (Last Trading Day)	Two business days prior to the Expiry day of the underlying Futures Contract		
Trading Unit	One MCX Natural Gas Futures Contract		
Underlying Quotation/ Base Value	Rs. / MMBtu		
Strikes	30 In-the-money, 30 Out-of-the-money and 1 Near-the money (61 CE and 61 PE). The Exchange, at its discretion, may introduce additional strikes, if required.		
Strike Price Intervals	Rs. 5	Tick Size (Minimum Price Movement)	Rs. 0.05
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. Price Scan Range – 3.5 B. Volatility Scan Range – 10 % (or such other % as prescribed by MCXCCL based on risk framework) C. Short Option Minimum Margin – 10% (or such other margin as prescribed by MCXCCL based on risk framework) D. Extreme Loss Margin – Minimum 1% (or such other margin as prescribed by MCXCCL based on risk framework) E. Premium of buyer shall be blocked upfront on real time basis The Margin Period of Risk (MPOR) shall be at least three days (or such other margin period of Risk (MPOR) as prescribed by MCXCCL based on risk framework). Parameters would be reviewed and changed, if required.		
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: 120,00,000 MMBtu or 5% of the market wide open position, whichever is higher for all Natural Gas Options Contracts combined together. For a member collectively for all clients: 12,00,00,000 MMBtu or 20% of the market wide open position, whichever is higher for all Natural Gas 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.		

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