SUBMISSION COVER SHEET

IMPORTANT: Check box if Confidential Treatment is requested ☐

Registered Entity Identifier Code (optional): <u>22-328</u>

Organization: <u>Chicago Mercantile Exchange Inc. ("CME")</u>

Filing as a: ☒ **DCM**   ☐ **SEF**   ☐ **DCO**   ☐ **SDR**

Please note - only ONE choice allowed.

Filing Date (mm/dd/yy): <u>08/24/22</u>   Filing Description: <u>Initial Listing of the Options on Ether Futures Contract</u>

SPECIFY FILING TYPE

Please note only ONE choice allowed per Submission.

Organization Rules and Rule Amendments

☐	Certification	§ 40.6(a)
☐	Approval	§ 40.5(a)
☐	Notification	§ 40.6(d)
☐	Advance Notice of SIDCO Rule Change	§ 40.10(a)
☐	SIDCO Emergency Rule Change	§ 40.10(h)

Rule Numbers:

New Product   **Please note only ONE product per Submission.**

☒	Certification	§ 40.2(a)
☐	Certification Security Futures	§ 41.23(a)
☐	Certification Swap Class	§ 40.2(d)
☐	Approval	§ 40.3(a)
☐	Approval Security Futures	§ 41.23(b)
☐	Novel Derivative Product Notification	§ 40.12(a)
☐	Swap Submission	§ 39.5

Official Product Name: <u>Options on Ether Futures</u>

Product Terms and Conditions (product related Rules and Rule Amendments)

☐	Certification	§ 40.6(a)
☐	Certification Made Available to Trade Determination	§ 40.6(a)
☐	Certification Security Futures	§ 41.24(a)
☐	Delisting (No Open Interest)	§ 40.6(a)
☐	Approval	§ 40.5(a)
☐	Approval Made Available to Trade Determination	§ 40.5(a)
☐	Approval Security Futures	§ 41.24(c)
☐	Approval Amendments to enumerated agricultural products	§ 40.4(a), § 40.5(a)
☐	"Non-Material Agricultural Rule Change"	§ 40.4(b)(5)
☐	Notification	§ 40.6(d)

Official Name(s) of Product(s) Affected:
Rule Numbers:

August 24, 2022

VIA ELECTRONIC PORTAL

Mr. Christopher J. Kirkpatrick
Office of the Secretariat
Commodity Futures Trading Commission
Three Lafayette Centre
1155 21st Street, N.W.
Washington, DC 20581

> **Re:** **CFTC Regulation 40.2(a) Certification. Initial Listing of the Options on Ether Futures Contract.**
> **CME Submission No. 22-328**

Dear Mr. Kirkpatrick:

Chicago Mercantile Exchange Inc. ("CME" or "Exchange") hereby certifies to the Commodity Futures Trading Commission ("CFTC" or "Commission") the initial listing of the Options on Ether Futures contract (the "Contract"), for trading on the CME Globex electronic trading platform ("CME Globex") and for submission for clearing via CME ClearPort effective on Sunday, September 11, 2022, for trade date Monday, September 12, 2022, as set forth below.

Section 1 - Contract Specifications

Contract Title	Options on Ether Futures
Rulebook Chapter	CME 349A
CME Globex and CME ClearPort Code	ETH
Contract Unit	One Ether Futures contract (CME Chapter 349; Commodity Code: ETH) which represents 50 ether as defined by the CME CF Ether-Dollar Reference Rate (ETHUSD_RR)
Trading and Clearing Hours	**CME Globex Pre-Open:** 4:45 p.m. – 5:00 p.m. CT (5:45 p.m. – 6:00 p.m. ET) **CME Globex:** Sunday - Friday 5:00 p.m. – 4:00 p.m. Central Time (CT) (6:00 p.m. – 5:00 p.m. Eastern Time (ET) with a 60-minute break each day beginning at 4 p.m. CT (5:00 p.m. ET) **CME ClearPort:** Sunday 5:00 p.m. - Friday 5:45 p.m. CT (6:00 p.m. – 6:45 p.m. ET) with no reporting Monday – Thursday 5:45 p.m. – 6:00 p.m. CT (6:45 p.m. – 7:00 p.m. ET)
Settlement Method	Deliver the nearest to expire future underlying the option
Listing Schedule	Monthly contracts listed for 6 consecutive months, quarterly contracts (Mar, Jun, Sep, Dec) listed for 4 additional quarters and a second Dec contract if only one is listed.
Initial Listing Schedule	Sep-22, Oct-22, Nov-22, Dec-22, Jan-23, Feb-23, Mar-23, Jun-23, Sep-23, Dec-23.

| Price Basis	Prices are quoted and traded in U.S. Dollars
Minimum Price Fluctuation	Outright: 0.50 index points = $25.00 per contract
	Calendar Spread: 0.05 index points = $2.50 per contract
Exercise Procedure	European Style (with no contrary instructions)
Strike Price Listing Schedule	Prelisted strikes at $50,000, $10,000, $5,000, $1,000, $500 and $100 ether strike increment. Strikes listed for 300% above the at-the-money strike and 100% below the at-the-money strike at: - $10,000 ether strike increment for underlying settlement above $50,000 - $5,000 ether strike increment for underlying settlement at or below $50,000 - $1,000 ether strike increment for underlying settlement at or below $10,000 - $500 ether strike increment for underlying settlement at or below $5,000 - $100 ether strike increment for underlying settlement at or below $1,000 - $50 ether strike increment for underlying settlement at or below $500 When less than 96 days remain until expiration (DTE), additional strikes listed for 75% above the at-the-money strike and 25% below the at-the-money strike at: - $1,000 ether strike increment for underlying settlement above $50,000 - $500 ether strike increment for underlying settlement at or below $50,000 - $100 ether strike increment for underlying settlement at or below $10,000 - $50 ether strike increment for underlying settlement at or below $5,000 - $10 ether strike increment for underlying settlement at or below $1,000 - $5 ether strike increment for underlying settlement at or below $500 When less than 14 days remain until expiration (DTE), additional strikes listed for 15% above the at-the-money strike and 5% below the at-the-money strike at: - $500 ether strike increment for underlying settlement above $50,000 - $250 ether strike increment for underlying settlement at or below $50,000 - $50 ether strike increment for underlying settlement at or below $10,000 - $25 ether strike increment for underlying settlement at or below $5,000 - $5 ether strike increment for underlying settlement at or below $1,000
Termination of Trading	Trading terminates at 4:00 p.m. London time on the last Friday of the contract month. If that day is not a Business Day in both the UK and the US, trading shall terminate on the preceding day that is a Business Day in either the UK or the US
Final Settlement	Delivery is by cash settlement by reference to the Final Settlement Price, equal to the CME CF Ether-Dollar Reference Rate (ETHUSD_RR) on the Last Day of Trading.
Position Limits and Reportable Levels	Spot Position Limits are aggregated with Ether Futures (ETH) Spot Month Limit: 8,000 contracts effective first trading day of the expiring contract month. Position Accountability Level: 20,000 ETH contracts in single months outside the spot month and in all months combined. Reportable Level: 1 Ether Futures contract.
Block Trade Minimum Threshold	5 contracts Reportable window: RTH 5 minutes; ETH/ATH 15 minutes

Section 2 – Index Administration, Governance, and Methodology

The Contract is exercisable into one (1) Ether Futures contract and is aligned aligns with the final settlement of the Ether Futures contract, which is the last Friday of every month. The Contract will settle to the corresponding Final Settlement Price for the Ether Futures contract, which in turn will immediately come to final cash settlement at the CME CF Ether-Dollar Reference Rate (ETHUSD_RR) published on the Ether Futures contract's last day of trading.

Evaluation of CME's Ethers Futures Contracts

The Ether Futures contract was initially launched for trading and clearing in 2021 (see CME Submission No. 21-005 dated January 22, 2021). The Ether Futures contract has since developed liquidity. Clearing support is provided by a broad spectrum of futures commission merchants ("FCMs").

Ether Futures Growth Since Launch
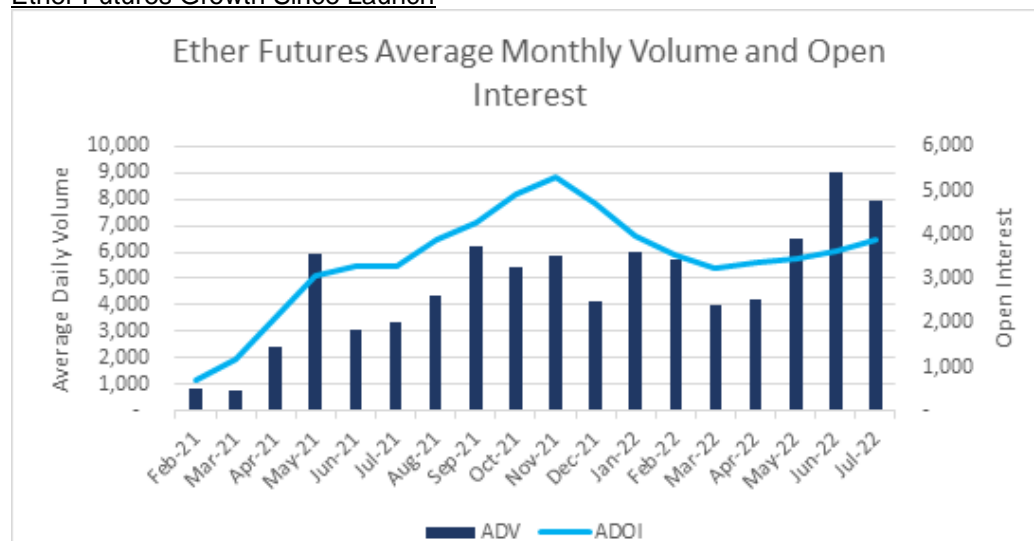
Source: CME Group

Cash Market Overview

Vitalik Buterin founded Ethereum as a concept in a White Paper[1] in late 2013. Since then, the development of Ethereum has been managed by a community of developers. A crowd sale to fund development took place in July 2014, and the blockchain went live on 30 July 2015.

Ethereum is a decentralized open source blockchain featuring smart contract functionality. The main Ethereum network is public and permissionless. Anyone can download or write software to connect to the network and start creating transactions and smart contracts without needing permission from any organization.

Ethereum's inbuilt native token is called ether (ETH). It can be traded for other cryptocurrencies or other sovereign currencies, just like bitcoin (BTC). According to Coinmarketcap.com

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[1] Source: https://ethereum.org/en/whitepaper/

(https://coinmarketcap.com/), Ether's market capitalization is estimated to be $191.9B[2] as of July 18, 2022. It is the second-largest cryptocurrency by market capitalization, behind bitcoin.

Ether Market Capitalization

Source: coinmarketcap.com

The 24-hour trading volume in ether is $27B compared with $40B in bitcoin as of July 18, 2022. Many alt-coins are based on the Ethereum network, which brings liquidity into the network's native cryptocurrency. Ether is actively traded across approximately 400 spot exchanges and other execution platforms that offer leveraged exposure. The value of a single ether has steadily climbed to an all-time high of $4,891.70 on November 16, 2021, the current price of July 18, 2022 is approximately $1,500.

Ether Price History

Source: coinmarketcap.com

Total Supply
Ethereum has its own blockchain, which contains blocks of data pertaining to transactions on the Ethereum network. A block contains details of all the transactions and smart contracts that have been transacted within a given timeframe. Blocks form a chain by referring to the hash (or fingerprint) of the previous block. The biggest difference between ether and bitcoin are the rules around token generation. For bitcoin, there will be a maximum supply of 21 million coins. According to the protocol, future ETH generation will be capped at 25% of the pre-mine, per year. This is to say that there is a maximum growth rate of 18 million ether which can be mined per year. There is no upper cap or limit. Theoretically the maximum is infinite.

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[2] Source: https://coinmarketcap.com/currencies/ethereum/

Ether token generation

New units of ether are created through mining. Mining is the process of confirming transactions, combining them into blocks and adding them to the blockchain. As a reward, and to keep miners incentivized, every time a block is completed, the miner responsible for creating that block receives a reward in the form of new ether. Miners compete to earn newly issued tokens known as the block reward.

Ether in Circulation

The total number of ETH in existence can be calculated as:
Pre-mine + Block rewards + Uncle rewards + Uncle referencing rewards + Eth2 staking rewards

Pre-mine

Approximately 72 million ETH were issued for the genesis block – the first ever block of the Ethereum blockchain. 60 million ETH were allocated to the initial contributors in the 2014 crowd sale that funded the project, and 20% or 12 million ETH were given to the development fund and the Ethereum Foundation.

Block reward

In Ethereum the time between blocks is around 14 seconds, compared with bitcoin's ~10 minutes.

The original block reward in 2015 was 5 ETH per block, which later went down to 3 ETH in late 2017. As of 2019, when a block is successfully mined on the Ethereum blockchain, a miner receives 2 ETH as a reward.

Over time, as more and more ETH are mined, the constant amount mined becomes a smaller and smaller portion of the total amount of existing ETH. The percentage mined of the total existing amount tends to 0% over time, asymptotically, never actually reaching 0%. Therefore, mining will never tail off. A constant amount of ETH will be mined forever. The chart below shows the bitcoin and ethereum generation models.

Additionally, an equilibrium will eventually be reached when the rate of ETH lost due to carelessness, destruction, etc. equals the rate of new ETH mined.

BTC vs ETH generation model
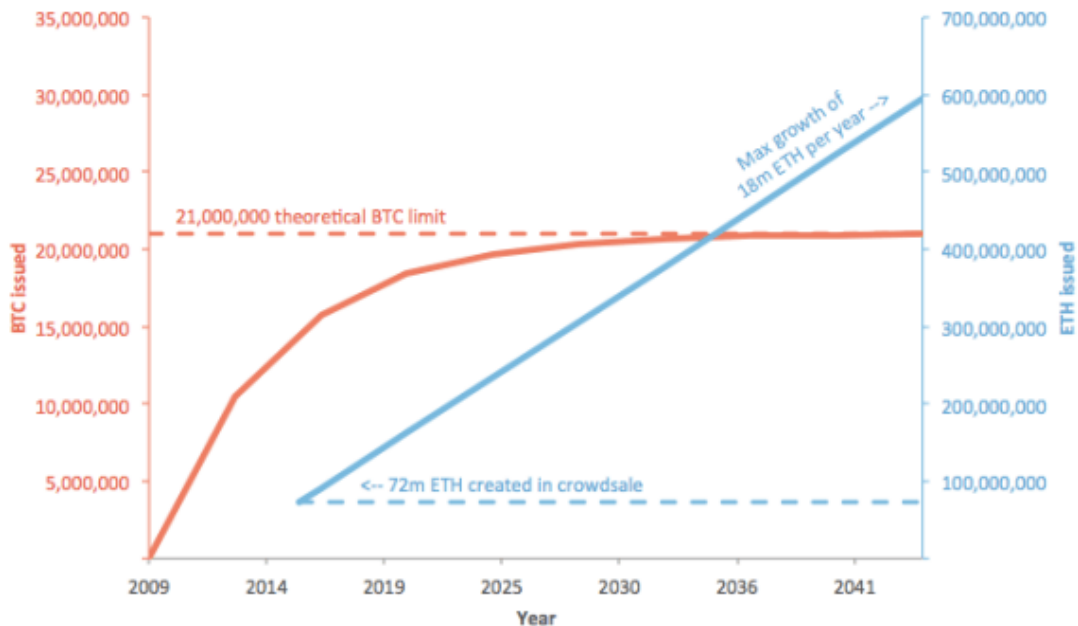
Uncle reward
Ethereum's rate of block generation is much higher than that of bitcoin. When more blocks are created more quickly, the rate of "block clashes" increases – i.e., multiple valid blocks can get created at almost the same time, but only one of them can make it into the main chain.

In bitcoin these blocks, that are mined a little late and do not form part of the main blockchain are called 'orphans' and are entirely discarded. However, with ethereum they are called 'uncles' and can be referenced by later blocks. This is called the uncle reward.

Uncle referencing reward
A miner who references an uncle also gets a fraction of ETH per uncle.

Gas Reward
The blocks are created or mined by some participants and distributed to other participants who validate them.
When a user sends ether or uses an Ethereum application, a small fee in ETH is charged to use the Ethereum network. In addition to block rewards for mining new ether tokens, the miner also receives a fee as an incentive to process and verify what the user is doing. Miners are like the record-keepers of Ethereum – they check and assure the validity of the transaction and keep the Ethereum network secure and free of centralized control.

In bitcoin, the maximum block size is specified in bytes whereas Ethereum's block size is based on complexity of contracts being run – it's known as a Gas limit per block, and the maximum can vary slightly from block to block.

Future Developments
Ethereum currently has Proof-of-Work (PoW) mining. Ethereum is moving to a consensus mechanism called proof-of-stake (PoS), this change has been on Ethereum's roadmap, as a plan to move from the electricity-expensive PoW mining to a more energy-efficient PoS protocol as part of the Eth2 upgrades.

Eth2 refers to a set of interconnected upgrades that will make Ethereum more scalable, more secure, and more sustainable. These upgrades are being built by multiple teams from across the Ethereum ecosystem.

Proof-of-stake is the underlying mechanism that activates validators upon receipt of enough stake. For Ethereum, users will need to stake 32 ETH to become a validator. Validators are chosen at random to create blocks and are responsible for checking and confirming blocks they do not create.

Unlike proof-of-work, validators do not need to use significant amounts of computational power because they are selected at random and are not competing.

Validators do not mine blocks; they just need to create blocks when chosen and validate or attest proposed blocks when they are not. Validators get rewards for proposing new blocks and for attesting to ones they have seen.

A user's stake is also used to incentivize good validator behavior. For example, a user can lose a portion of their stake for things like going offline (failing to validate) or their entire stake for deliberate collusion.

With any changes to Ethereum, such as the transition to PoS, the generation rate is guaranteed to not increase. But it may decrease.

Ether in Circulation

Currently there are 119.73 million ether in circulation. 72 million of which were issued in the genesis block. The remaining amount has been generated in the form of block rewards to the miners on the Ethereum network.

The chart below shows the ether supply growth– a breakdown of daily block reward, uncle inclusion reward, uncle reward and Eth2 staking to arrive at the total daily Ether supply.

Ether Supply Growth Chart
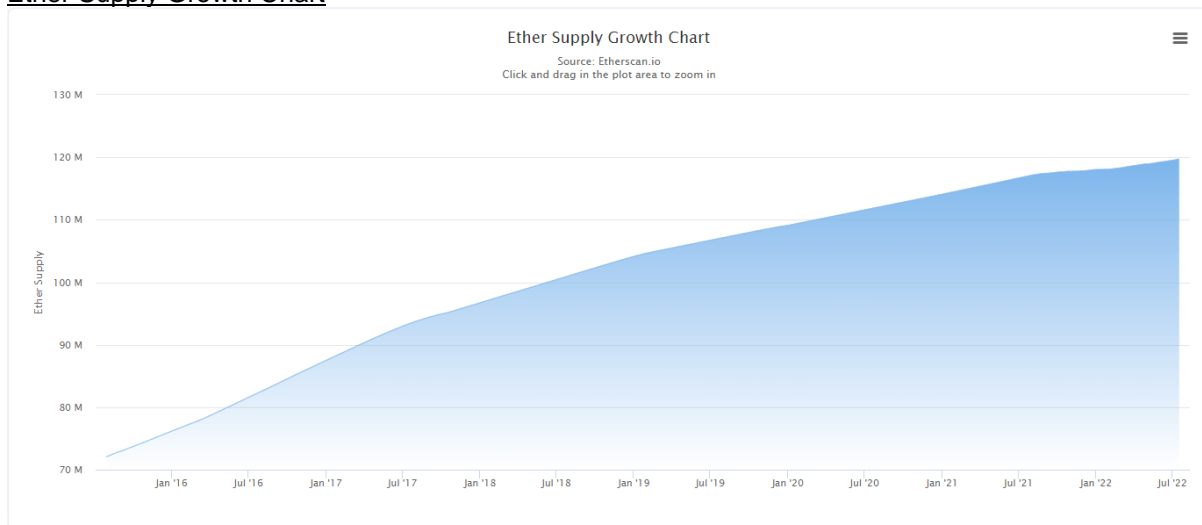
Source: etherscan.io

Ether Supply Distribution

Ether Distribution Overview

Genesis (60M Crowdsale 12M Other):	72,009,990.50 Ether
+ Mining Block Rewards:	46,483,441.91 Ether
+ Mining Uncle Rewards:	3,106,054.38 Ether
+ Eth2 Staking Rewards:	674,275.05 Ether
- Burnt Fees:	2,543,278.74 Ether
= Current Total Supply	119,730,483.09 Ether

Breakdown by Supply Types

- Genesis: Crowd Sale (60,000,000 ETH)
- Block Rewards – Burnt Fees (43,940,163.17056 ETH)
- Eth2 Staking Rewards (674,275.049169582 ETH)
- Genesis: Other (12,009,990.49948 ETH)
- Uncle Rewards (3,106,054.375 ETH)

Source: etherscan.io

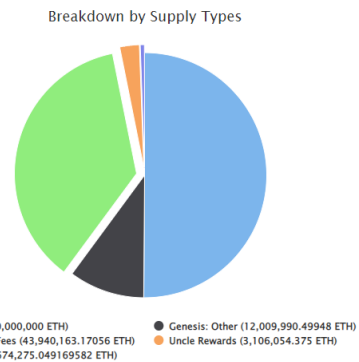The table and pie chart above, shows the distribution of ether from reward of both block and uncle block mining to arrive at the current total ether supply of 119.73 million.

Since inception in 2015, the chart below shows the actual number of ether tokens that were generated and therefore in circulation, at the end of each year, on an annual basis since inception.

Annual ether generated at the end of each calendar year

Year	Total Ether in Circulation at EOY	Total Percent Increase
2015	76,140,218	-
2016	87,462,107	15%
2017	96,692,242	11%
2018	104,124,058	8%
2019	109,094,019	5%
2020	114,078,849	5%
2021	118,039,550	3%
ytd 2022	119,745,549	1%

Source: etherscan.io. YTD is through 18 July 2022

The total circulating supply of ETH is not the total spendable supply. The total spendable supply is lower than the total circulating supply, due to accidental loss, willful destruction, and technical peculiarities.

From the total circulating supply of 119.73 million ether, one must discount for unrecoverable ether that are burned; permanently withdrawn from circulation or lost. There is no consensus on the number to be deducted, but best estimates indicate there to be about a 20% total loss. This would produce an estimate of 95.80 million ether as circulating supply. (equal to 119.73 million x 0.80).

Deliverable Supply

In theory, all 95.8 million units extant may be considered as notional deliverable supply of contract-grade commodity. A prudentially conservative estimate, however, would acknowledge that ether is traded in multiple currency denominations, including USD and EUR.

For illustration, consider that during the six months ending July 1, 2022, approximately 86% of fiat ether transaction volume was in the ETH:USD currency pair.[3] Using 80%, as a conservative USD market share as a proxy for the share of outstanding ether that stands as notional contract-grade supply for the Ether Futures contract, it would produce an estimate of 76.64 million ether (equal to 95.80 million x 0.80) as the 'money stock' notionally eligible for delivery in fulfilment of expiring contract months. The following analysis uses this estimate.

The Ether Futures contract has a contract size of 50 ether. By the standards applicable to agricultural or other commodity futures for physical delivery (i.e., 17 CFR 150.5(b)(1)), the position limit would be set at or below 25 percent of estimated spot month deliverable supply. Under current ether market conditions, the resultant maximum position limit would be 19.16 million ether, or 383,200 contracts ((equal to 76.64 million ether x 0.25) / (50 ether per contract)).

An alternative based on the standard that the Exchange has typically applied to foreign exchange futures products, according to which the position limit is set at or below one percent of the money stock in the contract-grade currency denomination. Applied to the estimated ether 'money stock', the result would be a position limit of 766,400 ether or 15,328 contracts ((equal to (76.64 million ether x 0.01) / (50 ether per contract)) or less.

Position Limits

In its initial certification of CME Ether Futures contract (Commodity Code: ETH) product rules to the CFTC in February 2021, the Exchange recommended a spot-month position limit of 8,000 ETH contracts.[4]

The position limit will be applicable in aggregate to Ether Futures, Micro Ether Futures, Options on Micro Ether futures, Ether Euro Futures and Options on Ether Futures.

Viewed in the context of the preceding cash market overview and to align with the Ether Futures contract, the aggregated Spot Month Position Limit shall be 8,000 ETH contracts effective on the first trading day of the expiring contract month.

The recommended quantity is sufficiently stringent that it would be highly unlikely to motivate attempted manipulation of the benchmark in connection with Contract final settlement and is significantly below the standard 25% 'money stock' analysis of deliverable supply test.

Options on Ether Futures contract shall share the Accountability Level with the Ether Futures contract. The Single Month Accountability Level and All Month Accountability Level shall be 20,000 ETH contracts. Additionally, to allow for increased transparency and more effective market surveillance, a reportable position level of one (1) Option on Ether Futures contract is recommended.

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[3] Source: www.coinmarketcap.com
[4] CME - Initial Listing of the Ether Futures Contract - https://www.cmegroup.com/market-regulation/rule-filings/2021/1/21-005.pdf

Section 3. Analysis CME CF Ether-Dollar Reference Rate

Overview

The Ether Futures contract's final settlement is determined by reference to the CME CF Ether-Dollar Reference Rate (ETHUSD_RR).

Governance

The Ether-Dollar Reference Rate is calculated and administrated by CF Benchmarks, a leading provider of cryptocurrency benchmarks and indices. CF Benchmarks is registered with the European Securities and Markets Authority ("ESMA") as a benchmark administrator in accordance with Article 34 of the EU Benchmark Regulation and under the regulatory supervision of the UK Financial Conduct Authority. The CME CF Benchmark Statement, which provides additional details on regulatory compliance requirements, is available on the CF Benchmarks website.[5]

Furthermore, an Oversight Committee is responsible for overseeing certain activities undertaken in connection with the Reference Rate by approving and regularly reviewing the calculation methodology, practice, standards, and definition of the reference rate to ensure it remains relevant and robust. Currently there are seven (7) members of the Oversight Committee. The Oversight Committee is comprised of a (1) CF Benchmarks representative, two (2) representatives from CME Group, and at least two (2) independent experts. The Oversight Committee meets at least once per quarter and publishes its minutes publicly on the CF Benchmark's website. Further details of the Oversight Committee's charter and related governance policies are available on the CF Benchmarks website.[6]

License Arrangements

There is sufficiency of data inputs for the calculation, and the data is provided under licensing arrangements with each Constituent Exchange, who in turn meet strict entry criteria.
The Exchange uses the Ether-Dollar Reference Rate under the terms of a data sharing license agreement with CF Benchmarks Ltd.

Constituent Exchange Eligibility Criteria

The Ether-Dollar Reference Rate is calculated from trades transacted on specific Constituent Exchanges. Specific eligibility criteria must be adhered to, in order to become a Constituent Exchange.

To assure that the CME CF Cryptocurrency Pricing Products reflect global cryptocurrency trading activity in a representative and unbiased manner, a geographically diverse set of spot trading venues is included within the current framework. Applications for new Constituent Exchanges to be added will be based on a set of predefined criteria, and the operation of existing Constituent Exchanges will be monitored against the same criteria. The Constituent Exchanges eligibility criteria is publicly available on the CF Benchmarks website.[7]

A trading venue is eligible as a Constituent Exchange in any of the CME CF Cryptocurrency Pricing Products if it facilitates spot trading of the relevant cryptocurrency against the corresponding fiat currency (the "Relevant Pair") and makes trade data and order data available through an Automatic Programming Interface ("API") with sufficient reliability, detail, and timeliness.

Furthermore, it must, in the opinion of the Oversight Committee, fulfil the below criteria:

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[5] CME-CF Benchmark Statement: https://docs-cfbenchmarks.s3.amazonaws.com/CME+CF+Benchmark+Statement.pdf
[6] CME-CF Oversight Committee Charter: https://docs-cfbenchmarks.s3.amazonaws.com/CME+CF+Oversight+Committee+Charter.pdf
CME-CF Practice Standards: https://docs-cfbenchmarks.s3.amazonaws.com/CME+CF+Practice+Standards.pdf
CME-CF Conflicts of Interest Policy: https://docs-cfbenchmarks.s3.amazonaws.com/CME+CF+Conflicts+of+Interest+Policy.pdf
[7] CME-CF Constituent Exchanges Eligibility Criteria: https://docs-cfbenchmarks.s3.amazonaws.com/CME+CF+Constituent+Exchanges+Criteria.pdf

1. The venue's Relevant Pair spot trading volume for an index must meet the minimum thresholds as detailed below for it to be admitted as a Constituent Exchange: The average daily volume the venue would have contributed during the observation window for the Reference Rate of the Relevant Pair exceeds 3% for two consecutive calendar quarters.
2. The venue has policies to ensure fair and transparent market conditions at all times and has processes in place to identify and impede illegal, unfair, or manipulative trading practices.
3. The venue does not impose undue barriers to entry or restrictions on market participants and utilizing the venue does not expose market participants to undue credit risk, operational risk, legal risk, or other risks.
4. The venue complies with applicable law and regulation, including, but not limited to capital markets regulations, money transmission regulations, client money custody regulations, know-your-client ("KYC") regulations and anti-money laundering ("AML") regulations.
5. The venue cooperates with inquiries and investigations of regulators and the Administrator upon request and must execute data sharing agreements with CME Group. Once admitted, a Constituent Exchange must demonstrate that it continues to fulfil criteria 2 to 5 inclusive. Should the average daily contribution of a Constituent Exchange fall below 3% for any Reference Rate then the continued inclusion of the venue as a Constituent Exchange to the Relevant Pair shall be assessed by the CME CF Oversight Committee.

Currently, there are six (6) Constituent Exchanges: Bitstamp, Coinbase, Gemini, itBit, LMAX and Kraken as more specifically noted below. The list of current Constituent Exchanges is also available on the CF Benchmarks website.[8]

Constituent Exchanges

Constitute Exchange	Date Added
Bitstamp	May 14, 2018
Coinbase	Oct 28, 2019
Gemini	Aug 30, 2019
itBit	July 15, 2019
LMAX	May 3, 2022
Kraken	May 14, 2018

Calculation Methodology

The Exchange commenced daily publication of the Ether-Dollar Reference Rate in May 2018. The Exchange publishes the rates on its website at 4:00 p.m. London time 365 days per year.

The Ether-Dollar Reference Rate is a daily reference rate of the US Dollar price of one ether. It is the aggregation of executed trade flow of major cryptocurrency spot exchanges that participate in the price discovery process as Constituent Exchanges during a specific one-hour calculation window (3:00 p.m. to 4:00 p.m. London time). All relevant transactions are added to a joint list, recording the trade price and size for each transaction. This one-hour window is then partitioned into twelve, five-minute intervals. For each partition, the volume-weighted median trade price is calculated from the trade prices and sizes of all relevant transactions across all Constituent Exchanges. The index is then derived from the equally weighted average of the volume-weighted medians of all partitions and published daily at 4:00 p.m. London time.

The calculation methodology is publicly available on the CF Benchmarks website.[9]

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[8] CME-CF Constituent Exchanges List: https://docs-cfbenchmarks.s3.amazonaws.com/CME+CF+Constituent+Exchanges.pdf
[9] CME-CF Reference Rate Methodology: https://docs-cfbenchmarks.s3.amazonaws.com/CME+CF+Reference+Rates+Methodology.pdf

Qualitative Description

CME CF Cryptocurrency Reference Rates are calculated based on the Relevant Transactions of all Constituent Exchanges. Calculation steps on any given Calculation Day are as follows:

1. All Relevant Transactions in the specified pair, from Constituent Exchanges are added to a joint list, recording the trade price and size for each transaction. The assessment is calculated based on one hour of trades per day from 3:00 p.m. to 4:00 p.m. London time (the "Observation Period").
2. The list is partitioned into a number of equally sized time intervals (12, 5-minute partitions).
3. For each partition separately, the volume-weighted median trade price is calculated from the trade prices and sizes of all Relevant Transactions, i.e., across all Constituent Exchanges.
4. The CME CF Cryptocurrency Reference Rate is then given by the equally weighted average of the volume-weighted medians of all partitions.

A pre-defined CF Benchmarks policy has also been established to evaluate any hard fork for its significance and impact on the index. Procedural policy details are provided in a Hard Fork Policy document on the CF Benchmark website.[10]

Methodology Design Choices

The calculation methodology mitigates to a high degree against price anomalies, while being replicable through spot trading on the Constituent Exchanges. This is achieved through several design choices around partitions, the weighting of those partitions, medians, and the volume weighting of medians. Further details on the methodology are available on the CF Benchmarks website.[11]

Overall, the Ether-Dollar Reference Rate is designed to have limited susceptibility to temporary price swings and outlier prices. There are criteria for an exchange to charge a fee for trading, which eliminates wash trading to increase volumes. The calculation only includes ether trades executed in US Dollar and (1) excludes alternate currency pairs or crypto to crypto trading, (2) does not apply conversion calculations, and (3) excludes stable coin transactions.

Not Readily Susceptible to Manipulation

The index is not readily susceptible to manipulation due to the design of the methodology. As noted above, the use of medians reduces the effect of outlier prices on one or more Constituent Exchange. The volume-weighting of medians filters out high numbers of small trades that may otherwise control the value of a non-volume weighted median. The use of twelve (12) non-weighted partitions assures that price information is sourced equally over the entire observation period. Influencing the rate would therefore require trading activity during multiple partitions on several exchanges over an extended period, which would prove a costly and an operationally intensive undertaking. The methodology is designed to remove the reliance on any single contributing exchange, where delayed or missing data from an exchange does not cause a calculation failure.

In accordance with the methodology, if for any Constituent Exchange the absolute percentage deviation of the volume-weighted median trade price in comparison with the median of the volume-weighted median trade prices of all Constituent Exchanges exceeds a given threshold (currently set at 10% and defined in the methodology), all relevant transactions of that Constituent Exchange are flagged as potentially erroneous and are disregarded in the calculation of index for that calculation day.

Furthermore, for inclusion in the calculation, a Constituent Exchange's spot trading volume must meet the minimum threshold (currently, 3% relative contribution over two (2) consecutive quarters) as detailed in the methodology.

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[10] CME-CF Hard Fork Policy: https://docs-cfbenchmarks.s3.amazonaws.com/CME+CF+Hard+Fork+Policy.pdf
[11] CME-CF Reference Rate Methodology: https://docs-cfbenchmarks.s3.amazonaws.com/CME+CF+Reference+Rates+Methodology.pdf

The criteria collectively cause that Constituent Exchanges deliver transparent and consistent trade and order data to CF Benchmarks via an API with sufficient reliability, detail, and timeliness.

Furthermore, the Constituent Exchanges maintain fair and transparent market conditions to impede illegal, unfair, or manipulative trading practices, and comply with applicable law and regulations including, capital markets regulations, money transmission regulations, client money custody requirements, know-your-client ("KYC") requirements, and anti-money-laundering ("AML") regulations.

The Constituent Exchanges are also required to cooperate with inquiries and investigations of the administrator (CF Benchmarks) and execute a data sharing agreement with CME.

According to coinmarketcap.com, ether trades on approximately 400 spot exchanges/platforms. Ether trades in US Dollar are transacted on approximately 10 spot exchanges.

In aggregate, the six (6) Constituent Exchanges that contribute data to the Ether-Dollar Reference Rate host several thousand transactions on a daily basis and represent over 80% of or ether to USD transactions, making the indices a source of price discovery and transparency for the market.

Quality of Data Inputs
The Ether-Dollar Reference Rate methodology adheres to rules in consideration of the following factors to ensure the robustness of the index:
- Delayed data and missing data
- Erroneous data
- Potentially erroneous data
- Calculation failure

The calculation process includes automated screening for erroneous data for non-numeric or non-positive trade price or trade size and un-parseable data.

Automated data validation checks are implemented for each Constituent Exchange individually. Such validation checks are made to ensure that the volume-weighted median trade price for one Constituent Exchange does not deviate too widely from the median of the volume-weighted median trade prices of all Constituent Exchanges. Any data that is outside of a pre-defined deviation tolerance of the other Constituent Exchanges results in the entire data set from that particular Constituent Exchange being discarded.

Volatility
The Exchange is adept at managing periods of prolonged volatility as well as spikes in volatility as has been demonstrated through its risk management of a variety of asset classes including commodities, agriculture, and financial products. The Exchange will implement certain risk controls on the Contract, including special price fluctuations limits, daily price limits, and margin levels that appropriately reflect the volatility of ether. Though the spikes in cryptocurrency volatility can look extreme, the daily price movements of the underlying reference rate are routinely in line with other CME Group contracts and reference rates that underlie Exchange-listed contracts.

Section 4 – Customer Feedback

CME Group currently offers Bitcoin, Ether, Micro Bitcoin and Micro Ether Futures, and options thereon, with the exception of Options on Ether Futures.

Demand for a standard sized Option on Ether Futures contract has been strong given the success current offering. Market participants have indicated that Options on Ether Futures contract could attract further participation.

Interest has come from banks, crypto lending platforms, traditional, as well as, crypto-focused hedge funds, futures liquidity providers and intermediaries. Such parties indicate that Options on Ether Futures, which are in turn cash-settled, US Dollar denominated contracts on a regulated exchange, would be a welcomed addition to the ecosystem which is currently dominated by unregulated platforms. Such contracts would allow market participants to hedge their long physical positions, allow others to gain exposure to this growing asset class and attract new participants who are not able to transact in unregulated markets, and would offer market participants a growing ecosystem and greater choice in terms of view expression.

Market activity has shown that traders are increasingly focused on Ether options. As a result of the extensive market participant validation, the Exchange understands that Miners and institutions with accumulated ether positions could use such a contract to more effectively hedge their long exposure and would be natural sellers. Institutional investors seeking to benefit from ether's growing popularity and the growing interest in the Ethereum Network, but who may not want direct exposure or may be restrained from accessing the physical ether market may seek to use the Contracts.

It is expected that professional trading companies looking to arbitrage price differences across multiple exchanges will provide additional liquidity. It is also expected that crypto lending platforms, OTC desks, hedge funds and crypto-focused hedge funds may participate as both buyers and sellers of the Contracts depending on their specific trading book and market view. In general, the ether market structure will be similar to other asset classes and will be comprised of hedgers, speculators, and market makers.

In the early development stages of the Contract, the Exchange engaged a group of market participants across a multitude of customer segments including proprietary trading firms, brokers, OTC platforms, crypto lending platforms, as well as traditional and crypto-focused hedge funds. During this extensive market participant validation period, contract specifications and other details were deliberated and validated.

The Exchange also engaged some of its clearing member firms to assess their operational readiness and assess potential impacts of the Contact. Clearing members generally did not express concern regarding the launch of the Contract from an operational or risk perspective. The Exchange also deliberated with clearing members who are material participants in this market. Such clearing members advised of their intent to approve trading of the Contract on a client-by-client basis.

Subsequent to publicly announcing its intention to launch the Contract, the Exchange has been in receipt of a significant amount of interest from market participants, inclusive of buy-side, commercials, and potential market makers spanning the spectrum of market segment and geographic location. Several bank and non-bank futures commission merchants ("FCMs") have indicated early support, and several have expressed commitment of trading the Contract on the first launch date.

Section 5 – Compliance with Core Principles

The Exchange reviewed the designated contract market core principles ("DCM Core Principles") as set forth in the Commodity Exchange Act ("CEA" or the "Act") and identified that the following DCM Core Principles may be impacted as follows:

Core Principle 2 – Compliance with Rules

Trading in the Contract shall be subject to CME Rulebook Chapter 4, which includes prohibitions against fraudulent, noncompetitive, unfair, and abusive practices. Additionally, trading in the Contract shall be subject to the Exchange's trade practice rules, the majority of which are contained in Chapter 5 and Chapter 8 of the Rulebook. Trading activity in the Contract shall be subject to monitoring and surveillance by CME Group's Market Regulation Department, which has the authority to exercise its investigatory and enforcement power where potential rule violations are identified.

Core Principle 3 – Contracts Not Readily Subject to Manipulation

The Exchange certifies that the underlying reference rate, the CME CF Ether-Dollar Reference Rate (ETHUSD_RR), is not readily subject to manipulation. The index is calculated from a large number of trades observed during the calculation window. The combination of volume weighting of medians and non-weighted partitions prevents manipulation in the reference rates. Ultimately, influencing the reference rate would require significant trading activity on several exchanges over an extended period of time.

The Ether-Dollar Reference Rate is calculated and administered by CF Benchmarks (registered with the European Securities and Markets Authority as a benchmark administrator in accordance with Article 34 of the EU Benchmarks Regulation) under the regulatory supervision of the UK Financial Conduct Authority.

The Ether-Dollar Reference Rate was first published on May 14, 2018 and has been calculated and published daily without exception to date. It is published daily on the CME Group website.

Core Principle 4 – Prevention of Market Disruption

Trading in the Contract will be subject to CME Rulebook Chapters 4 and 7, which include prohibitions on manipulation, price distortion, and disruption to the expiration and assignment process. As with any new product listed for trading on a CME Group designated contract market, trading activity in the Contract will be subject to monitoring and surveillance by CME Group's Market Regulation Department.

Core Principle 5 – Position Limits or Accountability

Positions for the Contract will be aggregated with the Exchange's Ether Futures contract (Commodity Code: ETH), Ether Euro Futures contract (Commodity Code ETE), Micro Ether Futures contract (Commodity Code: MET) and options thereon at the applicable ratio given the differing notional values. Uniform position limits will be applied to the contract. The spot month position limits will be aggregated with Ether Futures (ETH) and set at 8,000 ETH contracts effective on the first trading day of the expiring contract month. A position accountability level of 20,000 ETH contracts shall be applied to positions in single months outside the spot month and in all months combined.

The reportable level shall be one (1) Options on the Ether Futures contract. The position limits for the Contract are consistent with the Commission's guidance.

Core Principle 7 – Availability of General Information

The Exchange shall disseminate a Special Executive Report ("SER") that sets forth information in regard to specifications, terms, and conditions of the Contract. The SER will also be published on the Exchange's website.

Core Principle 8 – Daily Publication of Trading Information
The Exchange shall publish trading volumes, open interest levels, and price information daily of the Contract on the CME Group website and through quote vendors.

Core Principle 9 – Execution of Transactions
The Contract will be listed for trading on the CME Globex electronic trading and for clearing through CME ClearPort. The CME Globex electronic trading venue provides for competitive and open execution of transactions. CME Globex affords the benefits of reliability and global connectivity.

Core Principle 10 – Trade Information
All requisite trade information shall be included in the audit trail and will suffice for the Market Regulation Department to monitor for market abuse.

Core Principle 11 – Financial Integrity of Transactions
The Contract shall be cleared by CME Clearing, which is registered with the Commission as a derivative clearing organization, and which is subject to all CFTC regulations related thereto.

Core Principle 12 – Protection of Markets and Market Participants
Chapters 4 and 5 in the CME Rulebook set forth multiple strictures that preclude intermediaries from disadvantaging their customers. These Rules apply to trading in the Exchange's competitive trading venues and will apply to transactions in the Contract.

Core Principle 13 – Disciplinary Procedures
Chapter 4 of the CME Rulebook provide for the Exchange to discipline, suspend, or expel members or market participants who violate the rules of the Exchange. Trading in the Contract shall be subject to these provisions. The Exchange's Market Regulation Department has the authority to exercise its powers of enforcement, in the event that rule violations in the Contracts are identified.

Core Principle 14 – Dispute Resolution
Disputes in respect of the Contract shall be subject to the arbitration provisions set forth in Chapter 6 of both the CME Rulebook, which allow all nonmembers to submit to arbitration claims for financial loss resulting from transactions on the Exchange. Pursuant to these provisions, any member named as a respondent in any such claim submitted by a nonmember is required to participate in arbitration proceedings. Additionally, the Exchange requires members to resolve via arbitration all disputes concerning transactions on the Exchange.

Pursuant to Section 5c(c) of the Act and CFTC Regulation 40.2(a), the Exchange certifies that listing the Contract complies with the Act including all regulations thereunder. There were no substantive opposing views to this proposal.

The Exchange certifies that this submission has been concurrently posted on the Exchange's website at http://www.cmegroup.com/market-regulation/rule-filings.html.

Should you have any questions concerning the above, please contact the undersigned at (212) 299-2200 or via e-mail at CMEGSubmissionInquiry@cmegroup.com.

Sincerely,

/s/ Christopher Bowen
Managing Director and Chief Regulatory Counsel

Attachments: Appendix A   CME Rulebook Chapter 349A
                  Appendix B   Position Limit, Position Accountability, and Reportable Level Table in Chapter 5 of the CME Rulebook (attached under separate cover)
                  Appendix C   CME Rule 588.H. – ("Globex Non-Reviewable Trading Ranges") Table
                  Appendix D   CME Rule 589. – Special Price Fluctuation Limits and Daily Price Limits Table
                  Appendix E   Exchange Fees

Appendix A

CME Rulebook

Chapter 349A
Options on Ether Futures

349A00. **SCOPE OF CHAPTER**

This chapter is limited in application to options on Ether Futures ("futures"). In addition to this chapter, options on futures shall be subject to the general rules and regulations of the Exchange as applicable.

Unless otherwise specified, times referenced herein shall refer to and indicate Chicago time.

349A01. **OPTIONS CHARACTERISTICS**

349A01.A. Contract Months, Trading Hours, and Trading Halts

Options shall be listed for expiration on such dates and shall be scheduled for trading during such hours as may be determined by the Exchange, *provided that* there shall be no trading in options when trading is halted in the underlying Futures Contract Month for Ether Futures.

349A01.B. Trading Unit

The trading unit shall be an option to buy in the case of a call, or to sell in the case of a put, one Ether Futures contract (Chapter 349). Such Ether Futures contract shall represent 50 ether as valued by the CME CF Ether-Dollar Reference Rate ("ETHUSD_RR") in accordance with Rule 34901.

349A01.C. Minimum Fluctuations

Option prices shall be quoted in USD per ether (ETHUSD_RR Index points), each Index point representing $0.50 per ether $25.00 per Ether Futures contract.

Option Spreads and Combinations

Any option contract that trades as a component of a spread or combination shall be traded at a price that conforms to the applicable minimum price fluctuation as set forth in this Rule. The minimum price fluctuation shall be 0.50 Index points, equal to $25.00 per option contract.

349A01.D. Underlying Futures Contract

Monthly Options

For any Monthly option, the Underlying Futures Contract shall be for delivery on the last Friday of the same month as such option's named month of expiration, subject to Rule 34903.A.

349A01.E. Exercise Prices

Regularly-Listed Exercise Prices

On any Business Day, and subject to Rule 349A01.A., the Exchange shall ensure that Monthly put and call options are listed for trading at all eligible exercise prices set forth in the Strike Price Listing and Exercise Procedures Table.

349A01.F. Position Limits, Exemptions, Position Accountability and Reportable Levels

The applicable position limits and/or accountability levels, in addition to the reportable levels, are set forth in the Position Limit, Position Accountability and Reportable Level Table in the Interpretations & Special Notices Section of Chapter 5.

A Person seeking an exemption from position limits for bona fide commercial purposes shall apply to the Market Regulation Department on forms provided by the Exchange, and the Market Regulation Department may grant qualified exemptions in its sole discretion.

Refer to Rule 559 for requirements concerning the aggregation of positions and allowable exemptions from the specified position limits.

349A01.G. Nature of Options

Upon exercise of a put option on behalf of the long holder of such option, the short holder of such option shall incur the obligation to assume a long position in one Underlying Futures Contract (Rule 349A01.D.) at such option's exercise price (Rule 349A01.E.). Upon exercise of a call option on behalf of the long holder of such option, the short holder of such option shall incur the obligation to assume a short position in one Underlying Futures Contract at such option's exercise price.

Monthly Options

A Monthly option (Rule 349A01.D.) will be exercised only at its expiration.

349A01.H. Daily Price Limits

At the commencement of each trading day, the contract shall be subject to special price fluctuation limits and daily price limits as set forth in Rule 589 and in the Special Price Fluctuation Limits Table in the Interpretations & Special Notices Section of Chapter 5.

349A01.I. Termination of Trading
Monthly Options
Trading in any Monthly option shall terminate on the same date and at the same time as the termination of trading in such option's Underlying Futures Contract (Rule 349A01.D.).

If that day is not a business day in both the UK and the US, trading shall terminate on the preceding day that is a business day in either the UK or the US.

349A01.J. [Reserved]

349A02.   EXERCISE AND ASSIGNMENT

In addition to the applicable procedures and requirements of Chapter 7, the following shall apply to the exercise of options.

349A02.A. Exercise
Monthly Options
Any Monthly option (Rule 349A01.D.) may be exercised only at, and not before, the expiration of such option. Following termination of trading in expiring options, any such option that is in the money shall be automatically exercised by the Clearing House, and any such option that is out of the money shall be abandoned by the Clearing House. For the avoidance of doubt, no such option that expires in the money may be abandoned, and no such option that expires out of the money may be exercised.

An expiring call option shall be in the money if the corresponding Final Settlement Price for the Underlying Futures Contract (Rule 34903.A) is at or above such option's exercise price, and shall be out of the money if the corresponding Final Settlement Price is strictly below such option's exercise price.

 An expiring put option shall be in the money if the corresponding Final Settlement Price for the Underlying Futures Contract (Rule 34903.A) is strictly below such option's exercise price, and shall be out of the money if the corresponding Final Settlement Price is at or above such option's exercise price.

349A02.B. Assignment
Monthly Options
For a given option contract, an exercise by the Clearing House in accordance with Rules 349A02.A. shall be assigned by the Clearing House to clearing members carrying open short positions in such option contract.

The clearing member representing the short holder of such option shall be assigned a short position in such option's Underlying Futures Contract (Rule 349A01.D.) if such option is a call, or a long position in such option's Underlying Futures Contract if such option is a put.

The clearing member representing the long holder of such option shall be assigned a long position in such option's Underlying Futures Contract if such option is a call, or a short position in such option's Underlying Futures Contract if such option is a put.

All such futures positions shall be assigned at a price equal to the exercise price of such option contract, and shall be marked to market (in accordance with Rule 814) on the Business Day on which the Clearing House automatically exercises such.

**CME Rulebook
Chapter 5
("Trading Qualifications and Practices")
Position Limit, Position Accountability, and Reportable Level Table**

(attached under separate cover)

Appendix C

**CME Rulebook
Chapter 5
("Trading Qualifications and Practices")
Rule 588.H. – ("Globex Non-Reviewable Trading Ranges") Table**

(additions underlined)

Instrument	Globex Symbol	Globex Non-Reviewable Ranges (NRR)
Options on Ether Futures	ETH	The greater of the following: • Delta multiplied by the underlying futures non-reviewable range • 20% of premium up to the futures underlying non-reviewable range • 5 ticks

Appendix D

**CME Rulebook
Chapter 5
("Trading Qualifications and Practices")
Rule 589. – Special Price Fluctuation Limits and Daily Price Limits Table**

(additions underlined)

Product	Rulebook Chapter	Commodity Code	Primary/ Associated	Associated With	Daily Price Limit
Options on Ether Futures	349A	ETH	Associated	ETH	Daily Price Limit Table

Appendix E

Exchange Fees

Membership Type	Venue/Transaction Type	Fee
Individual Members Clearing Members Rule 106.J Equity Member Firms & Rule 106.J Qualified Subsidiaries Rule 106.I Members & Rule 106.I Qualified Affiliates Rule 106.S Member Approved Funds	CME Globex	$2.00
	EFP	$3.67
	EFR	$3.67
	Block	$3.67
	Delivery	$0.75
	Exe|Asn|Future From	$0.80
Rule 106.D Lessees Rule 106.F Employees	CME Globex	$2.90
	EFP	$4.41
	EFR	$4.41
	Block	$4.41
	Delivery	$1.20
	Exe|Asn|Future From	$1.25
Rule 106.R Electronic Corporate Members (For other than CME Globex - Non-Member rates apply)	CME Globex	$2.96
Rule 106.H and 106.N Firms	CME Globex	$3.14
	EFP	$4.63
	EFR	$4.63
	Block	$4.63
	Delivery	$1.32
	Exe|Asn|Future From	$1.37
International Incentive Program (IIP) Participants International Volume Incentive Program (IVIP) Participants (For other than CME Globex - Non-Member rates apply)	CME Globex	$4.00
Central Bank Incentive Program (CBIP) Participants Latin American Fund Manager Incentive Program (FMIP) Participants (For other than CME Globex - Non-Member rates apply)	CME Globex	$4.00
CBOE Members (For S&P products only; for all other products - Non-Member rates apply)	CME Globex	$4.00
	EFP	$7.33
	EFR	$7.33
	Block	$7.33
	Delivery	$1.50
	Exe|Asn|Future From	$1.55
Members Trading Outside of Division (For other than CME Globex During ETH - Non-Member rates apply)	CME Globex During ETH Only	$3.85
Non-Members	CME Globex	$4.00
	EFP	$7.33
	EFR	$7.33
	Block	$7.33
	Delivery	$1.50
	Exe|Asn|Future From	$1.55

Processing Fees	Fee
Position Adjustment/Position Transfer	$0.10
Give-Up Surcharge	$0.05
Facilitation Fee	$0.40