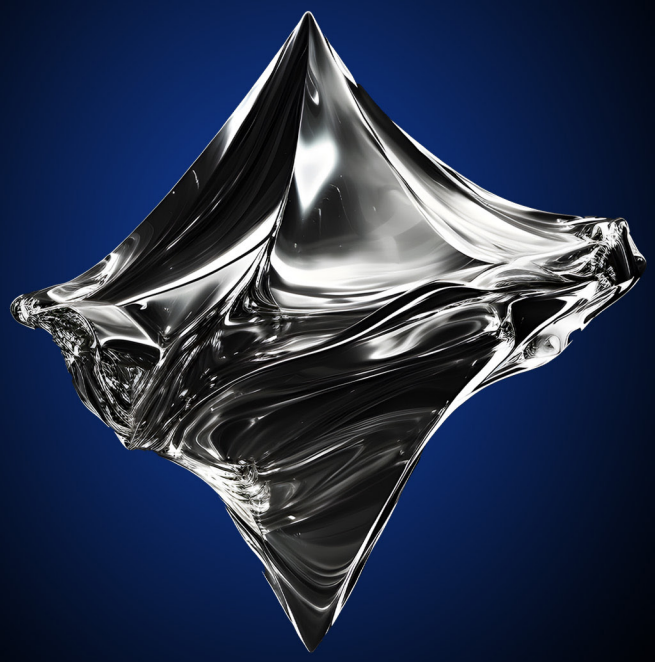
CDCETH

An Enterprise-grade
Liquid Staking protocol by crypto.com

Version 1.0



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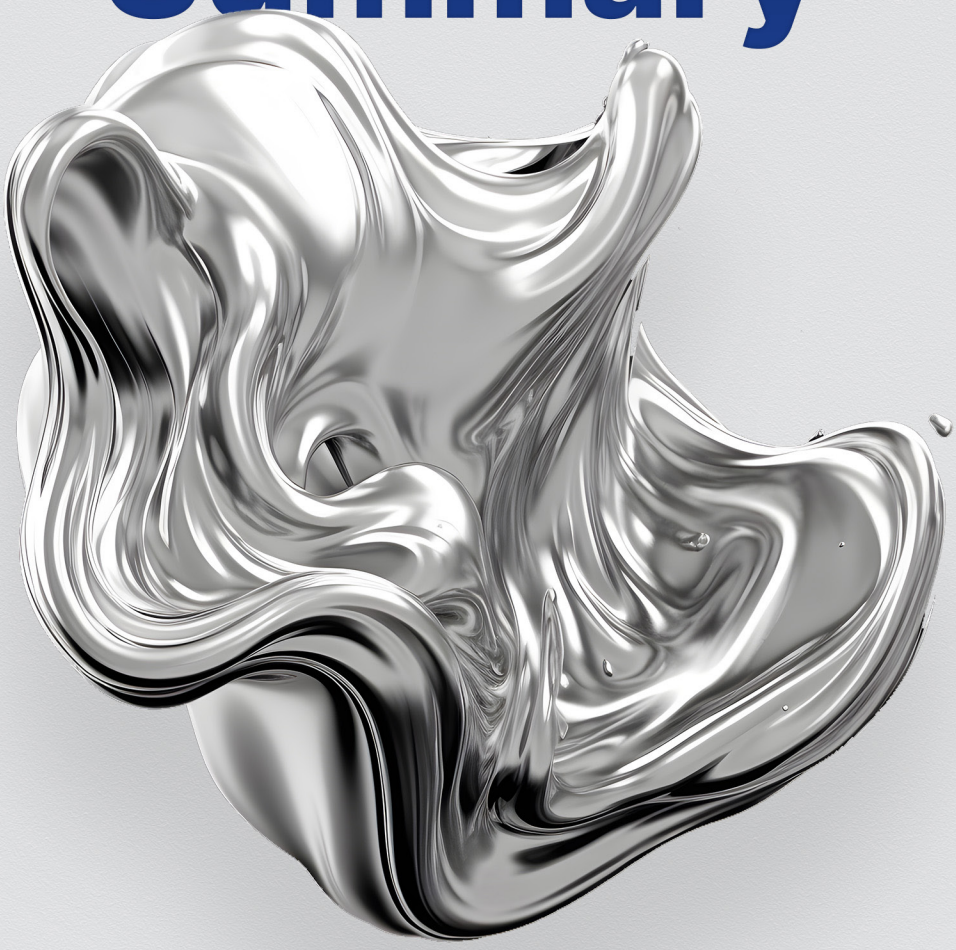
Executive Summary



ETH staking benefits both ETH holders and the Ethereum network, but the conventional method presents many limitations.

Stakers lose liquidity on their locked assets, are subject to potentially long waiting times, and risk incurring slashing penalties.

This whitepaper introduces Crypto.com Staked ETH (CDCETH), an enterprise-grade liquid staking protocol offered by Crypto.com. CDCETH provides an instant, efficient, and liquid way of participating in the Proof-of-Stake consensus mechanism on Ethereum and maintaining the integrity of the network.

Crypto.com App and Exchange users can unlock liquidity on their staked ETH instantly by electing to post it for CDCETH. Conversely, they can redeem their CDCETH back to the underlying staked ETH via Crypto.com's best-in-class on-chain staking service. CDCETH tokens will have utility inside and outside the Crypto.com ecosystem.

The launch of CDCETH furthers our mission to accelerate the world's transition to cryptocurrency, as we continue introducing innovative and regulated services to our users.

The Case for Liquid Staking

2.1 What is Proof-of-Stake?

Ethereum's Proof-of-Stake consensus mechanism is essential for maintaining the integrity of the network. The Ethereum Foundation provides the following overview[1] of this mechanism:

"Validators explicitly stake capital in the form of ETH into a smart contract on Ethereum. The validator is then responsible for checking that new blocks propagated over the network are valid and occasionally creating and propagating new blocks themselves. If they try to defraud the network (for example, by proposing multiple blocks when they ought to send one or sending conflicting attestations), some or all of their staked ETH can be destroyed."

ETH holders can participate in staking by locking their ETH with validators and receiving staking rewards in return for securing the network.

1. https://ethereum.org/en/developers/docs/consensus-mechanisms/pos/

2.2 Issues with Proof-of-Stake

Even though ETH staking benefits both ETH holders and the Ethereum network, stakers must be aware of three key constraints in this process:

No liquidity:

The utility of staked ETH is drastically diminished as it cannot be transferred or sold during all stages of the staking process.

Entry and exit delay:

When ETH is initially locked with a validator for staking, it enters an activation queue and does not generate rewards until fully activated. The length of this queue depends on how much ETH is being staked simultaneously. Likewise when ETH is unstaked, it does not generate rewards while pending withdrawal. These periods of inactivity come at a cost to the user and can significantly dilute the effective staking reward rate.

Slashing risk:

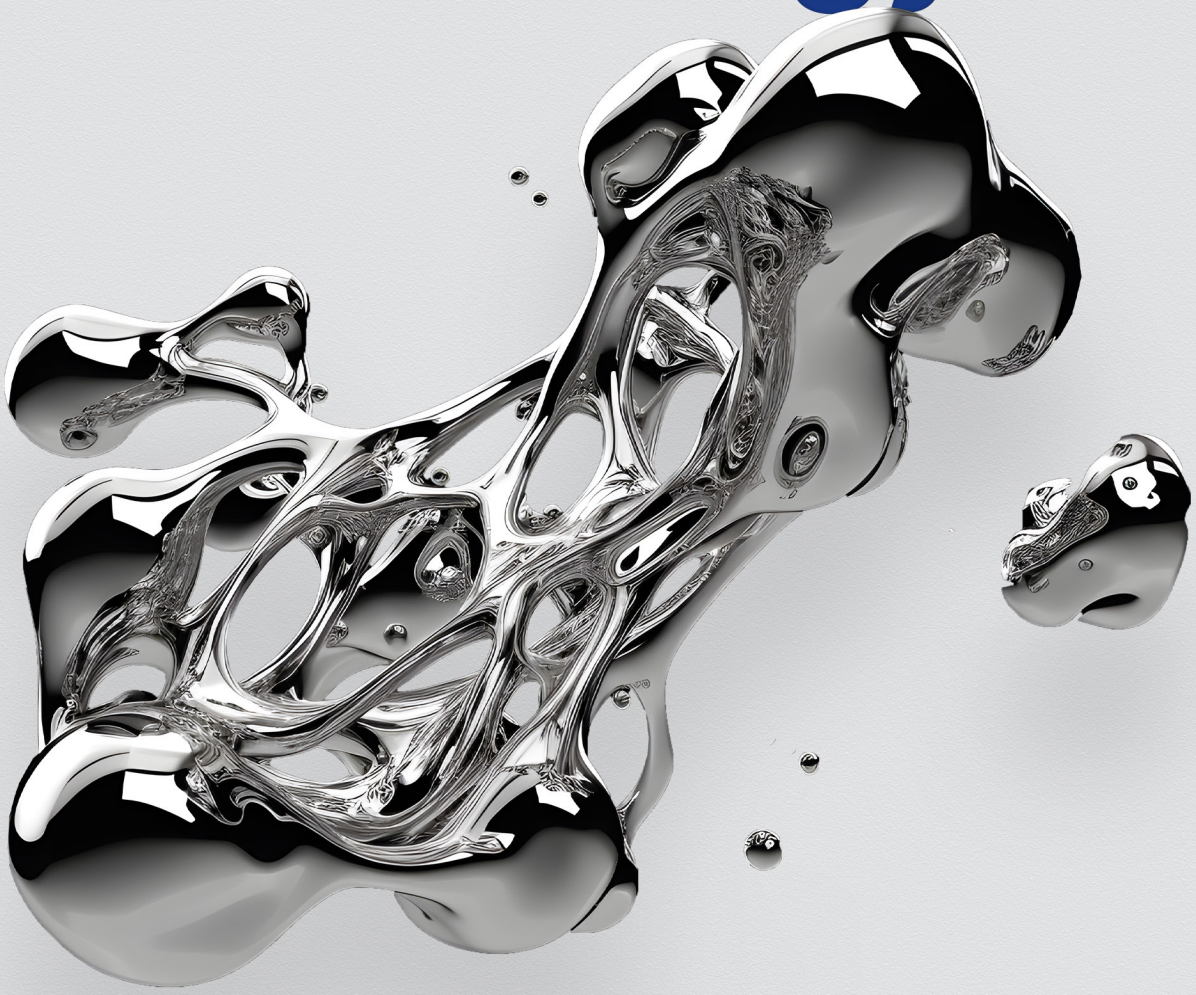
Staked ETH is confiscated from validators who underperform or misbehave; this act is known as slashing. The average ETH holder typically lacks the resources and know-how to run a validator and would bear a non-trivial amount of slashing risk. For this reason, most holders delegate ETH to professional staking-as-a-service providers like Crypto.com.

2.3 Liquid Staking as a Solution

Liquid staking protocols were developed to address the aforementioned constraints. When a user stakes ETH through a liquid staking protocol, the protocol issues a receipt token representing a right to redeem the staked ETH and the rewards generated by that stake. These liquid staking receipt tokens address staking constraints because they:

- Can be traded,
- Generate yield immediately, and
- May offer reduced slashing risk because of the use of enterprise-grade validators and slashing insurance

Technology



The CDCETH liquid staking token represents its holder's underlying staked ETH and all rewards (and penalties) generated by that staked ETH.

Crypto.com App users may access the CDCETH protocol by first staking their ETH through our on-chain staking service. Once their ETH is staked, they can exchange their illiquid staked position for the corresponding amount of liquid CDCETH receipt token — all through a user-friendly interface. The CDCETH can be redeemed for their illiquid staked position at any time using the same in-app feature.

Alternatively, users may purchase CDCETH tokens on other Crypto.com platforms, including the Crypto.com Exchange and Crypto.com DeFi Wallet, or through other third-party platforms and dApps that support CDCETH. CDCETH will initially be launched on Cronos as a CRC-20 token and subsequently on Ethereum as an ERC-20 token.

CDCETH tokens will follow the cToken standard. Under this standard, CDCETH holders convert between their illiquid staked ETH position and CDCETH based on the conversion rate published by the CDCETH protocol. The rate is calculated to ensure that the user's CDCETH can be accurately exchanged for the underlying value in ETH that it is meant to represent. See the 'Value Accrual' section for more details.

All net rewards generated on the underlying ETH will be re-staked so users can enjoy compounded rewards.

Lastly, it should be noted that there is no difference in validator quality regardless of whether users hold illiquid staked ETH or liquid CDCETH. The underlying ETH is, in both instances, staked with industry-grade validators that are carefully managed and optimally configured to achieve staking rewards. See *'The CDC Advantage'* section for more details.

Value Accrual

CDCETH tokens retain their initial principal value and accrue staking rewards (net of slashing penalties) over time through a protocol-specified conversion rate.

As mentioned earlier, CDCETH holders can convert between their illiquid staked position and CDCETH based on the conversion rate published by the CDCETH protocol.

The conversion rate is determined based on the ratio between the total value of ETH managed by the protocol and the total amount of outstanding CDCETH tokens issued by the protocol. The total value of ETH equals the sum of staked ETH and staking rewards earned, less slashing penalties and ETH staking fees[2].

2. The CDCETH protocol is free to use. That said, the underlying Crypto.com ETH staking service is subject to fees.

Protocol State

Staked ETH	100
Net ETH rewards	0
CDCETH outstanding	100
Conversion rate	1 CDCETH: 1 ETH

Calculation: (100+0) / 100

Protocol State

Staked ETH	100
Net rewards	0
CDCETH	100
Conversion rate	1 CDCETH: 1 ETH

Calculation: (100+0) / 100

Protocol State

Staked ETH	200
Net rewards	8
CDCETH	100
Conversion rate	1 CDCETH: 1 ETH

Calculation: (200+8) / 100

Scenario A
New users join protocol

ETH deposited	100
CDCETH issued	100

Calculation: 100 / 1

Scenario B
Staked Ethereum encures rewards

ETH rewards accured	8
CDCETH issued	0

Scenario A
New users join protocol

ETH rewards accured	100
CDCETH issued	96.15

Calculation: 100 / 1.04

Protocol State

Staked ETH	200
Net ETH rewards	0
CDCETH outstanding	200
Conversion rate	1 CDCETH: 1 ETH

Calculation: (200+0) / 200

Protocol State

Staked ETH	200
Net rewards	8
CDCETH	200
Conv. rate	1 CDCETH: 1.04 ETH

Calculation: (200+8) / 200

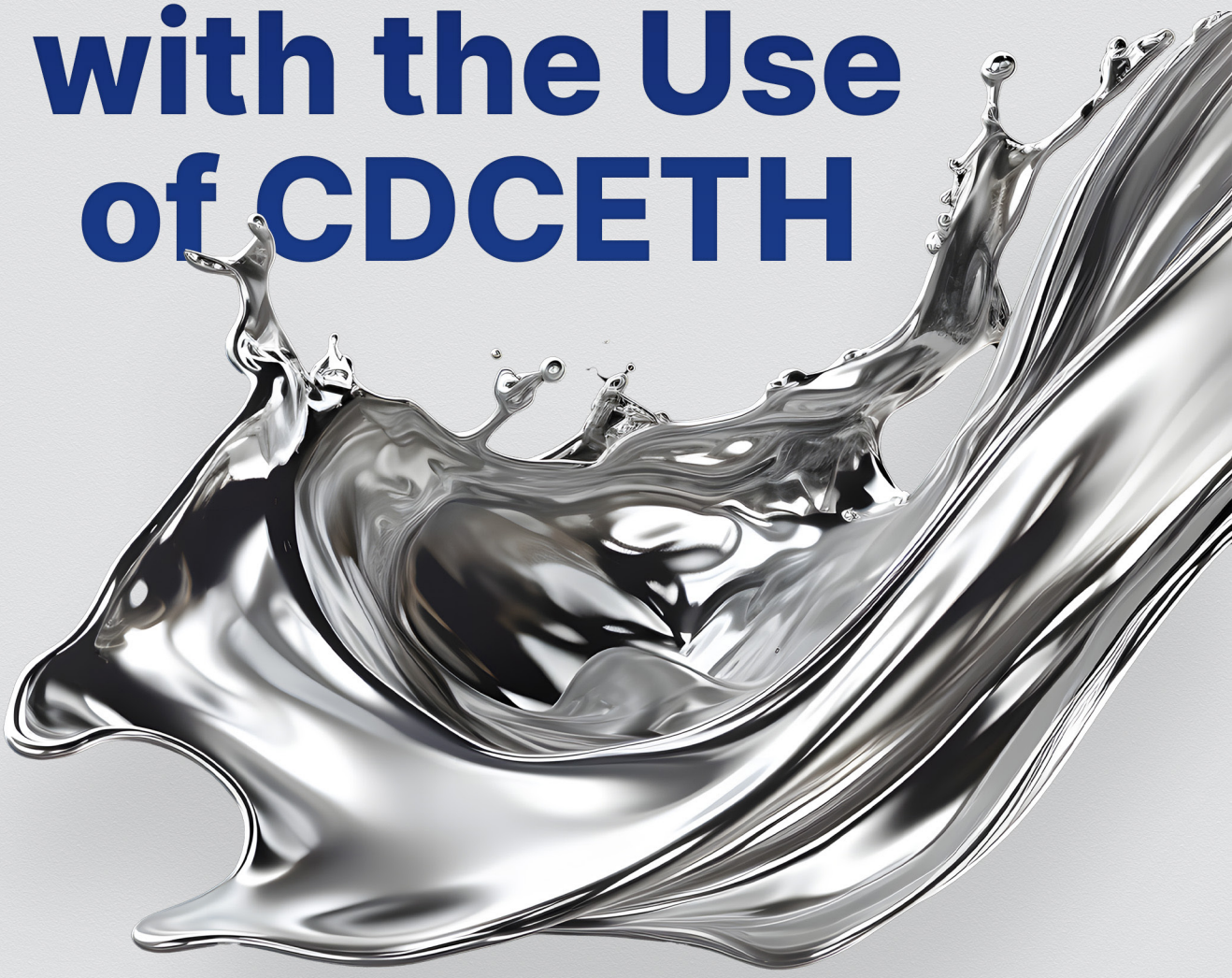
Protocol State

Staked ETH	300
Net rewards	8
CDCETH	296.15
Conversion rate	1 CDCETH: 1 ETH

Calculation: (300+8) / 296.15

Note that the protocol-specified conversion rate may differ from the market exchange rate because of demand and supply. The CDCETH protocol ensures that CDCETH can always be redeemed at conversion rate regardless of market rate.

Risks Associated with the Use of CDCETH



5.1 Slashing risk

All validators bear a non-zero risk of being slashed by the Ethereum network for unavailability, low speeds, mistakes, or malicious performance.

We seek to mitigate the probability of slashing by carefully managing our validators. Third-party validators are subject to strict scrutiny and ongoing monitoring.

Finally, we aim to reduce the impact of any slashing event by actively seeking remediation and exploring opportunities for slashing insurance.

5.2 Smart contract risk

The smooth functioning of the CDCETH protocol is dependent on the robustness of all associated smart contracts.

There is a risk that the protocol may fail to function smoothly because of errors in smart contract code or exploitation of previously undetected security vulnerabilities.

We have mitigated this risk through multiple smart contract audits with reputable auditors and intend to continue engaging in additional audits before any significant upgrades.

5.3 Blockchain risk

The smooth functioning of the CDCETH protocol is also heavily reliant on the smooth functioning of its underlying blockchain network. Disruption of services may cause users to lose access to their CDCETH or underlying staked ETH.

Our dedicated development team will work closely with the relevant blockchain foundations to minimise the impact of any blockchain network issues.

5.4 Custodial risk

The risk of an error or security failure may result in a loss of data or access to stored digital assets. We seek to mitigate this risk by engaging the services of industry-grade digital asset custodians.

CDCETH and ETH tokens will be held in custodial cryptographic wallets that are safeguarded using Multiparty Computation (MPC) to ensure no private keys ever exist in their full form at any time. Private keys will also be secured with Confidential Computing, specifically through multiple Trusted Execution Environments (TEE), a hardware-enforced security boundary that prevents keys or secrets stored within the host machine from being extracted by the administrator, malware, or hackers who have gained control over the host machine.

Our digital asset custodian technology is also certified SOC 2 Type II compliant and has achieved ISO 27001 (Information Security Management System), ISO 27701 (Privacy Information Management System), ISO 22301 (Business Continuity Management), and ISO 27017 (security in the cloud), ISO 27018 (privacy in the cloud) certifications. Additionally, our custodian has also achieved the 'Adaptive (Tier 4)' maturity level (as defined by the National Institute of Standards and Technology (NIST) Cybersecurity Framework developed by the US Department of Commerce.

5.5 CDCETH market risk

As mentioned in Section 4, the market price for CDCETH can fluctuate independently of the underlying assets it represents. The CDCETH protocol will not actively influence any convergence in value between the issued CDCETH tokens and the underlying ETH.

That said, the CDCETH protocol is designed to ensure that CDCETH can always be redeemed for staked ETH on Crypto.com, and that redemption will take place at a protocol-specified conversion rate that is independent of market prices.

5.6 Legal & regulatory risk

The legal and regulatory treatment of cryptographic tokens and digital assets may change and vary according to jurisdiction. Different jurisdictions may apply different legal categorisations of cryptographic tokens and digital assets, characterising them as, for example, currency, commodities, virtual currency, virtual commodity, or other property or instruments. Some jurisdictions may restrict or ban cryptographic token-related activities.

Accordingly, any cryptographic token or digital asset may decrease in value or lose all of its value because of legal or regulatory changes.

CDCETH and staking of ETH generally is not available in all jurisdictions. It is your responsibility to ensure that you are eligible to participate in ETH staking and engage with CDCETH. Crypto.com may not offer or support ETH staking or some or all aspects relating to CDCETH in your jurisdiction.

The CDC Advantage

CDCETH provides instant, secure, and efficient access to one of the best staking services in the industry.

Crypto.com's ETH staking service is powered by best-in-class enterprise-grade validators, managed by an experienced team of cross-functional experts, and integrated with the wide range of exciting products that we offer at Crypto.com.

Best-in-class validators

All of our staking service providers are subject to extreme scrutiny to ensure that they meet our performance and security standards. To date, all our Ethereum staking providers have achieved at least 99.9% effective uptime and no slashing penalties. Our providers also provide service-level guarantees and slashing coverage.

Prior to onboarding, all providers also undergo a rigorous audit of compliance and security policies, certifications, smart contracts (if any), and disaster recovery plans.

Cross-functional expertise

CDCETH and the underlying staking services are maintained by a sophisticated team of protocol experts, technologists, and cybersecurity experts, ensuring that we are able to rapidly respond to protocol updates and continuously deliver reliable performance.

Integrated Crypto.com experience

CDCETH is but one component of the overall Crypto.com experience. We are committed to improving the utility of CDCETH within the Crypto.com ecosystem and in the broader DeFi ecosystem. Examples of such utility could include:

- Acceptance of CDCETH as collateral for Crypto.com's lending services
- DeFi pools for CDCETH/ETH and other pairs
- Tradability of CDCETH

Disclaimers

7.1 Licences and approvals (if required) are not assured in all jurisdictions

Crypto.com intends to operate in full compliance with applicable laws and regulations and use its best endeavours to obtain any necessary licences and approvals (if any) to provide staking services and CDCETH functionality in your jurisdiction. It is not possible to guarantee, and no person makes any representations, warranties or assurances, that any such licences or approvals will be obtained within a particular timeframe or at all. Moreover, laws and regulations evolve so Crypto.com makes no guarantees, representations, or warranties that it will be able to obtain any necessary licences or approvals that may be implemented in the future. Accordingly, Crypto.com may be required to restructure to alter the activities described in this white paper. In addition, such services may be unavailable in all or certain respects in certain jurisdictions or may not be available at all.

7.2 No financial or investment advice

This whitepaper does not constitute any investment advice, financial advice, trading advice or recommendation by Crypto.com, its affiliates, or its respective officers, directors, managers, employees, agents, advisors or consultants on the merits of purchasing, selling, redeeming, holding, or using any cryptographic token nor should it be relied upon in connection with any other contract or purchasing decision.

7.3 Not a sale of security

This whitepaper does not constitute a prospectus or financial service offering document and is not an offer to sell or solicitation of an offer to buy any security, investment products, regulated products or financial instruments in any jurisdiction.

7.4 No representations or warranties

No representations or warranties have been made to the recipient of this whitepaper or its advisers as to the accuracy, quality, suitability or completeness of the information, statements, opinions or matters (express or implied) arising out of, contained in or derived from this whitepaper or any omission from this document or of any other written or oral information or opinions provided now or in the future to any interested party or their advisers. No representation or warranty is given as to the achievement or reasonableness of any plans, future projections or prospects, including with respect to the functioning or development of the CDCETH protocol or any applications thereof or services provided by third parties whom we do not control, and nothing in this document is or should be relied upon as a promise or representation as to the future. To the fullest extent possible, all liability for any loss or damage of whatsoever kind (whether foreseeable or not and whether or not Crypto.com has been advised of the possibility of such loss or damage) which may arise from any person acting on any information and opinions contained in this whitepaper or any information which is made available in connection with any further enquiries, notwithstanding any negligence, default or lack of care, is disclaimed.

7.5 Translations

This whitepaper and related materials are issued in English. Any translation is for reference purposes only and is not certified by any person. No assurance can be made as to the accuracy and completeness of any translations. If there is any inconsistency between a translation and the English version of this whitepaper, the English version shall prevail.

7.6 Graphics, Illustrations and Examples

All graphics, illustrations and examples included in this whitepaper are for illustrative purposes only. In particular, graphics, illustrations and examples with price references do not translate into actual pricing information.

7.7 Risk statements

Cryptographic tokens and custody of cryptographic tokens may be subject to expropriation and/or theft; hackers or other malicious groups or organisations may attempt to interfere with the CDCETH protocol and the dApps or networks that it operates within. Examples of interference include malware attacks, denial of service attacks, consensus-based attacks, Sybil attacks, phishing, hacking, social engineering, Forks, misinformation campaigns, smurfing, and spoofing which may result in the loss of your cryptographic tokens or the loss of your ability to access or control your cryptographic tokens. In such an event, there may be no remedy, and holders of cryptographic tokens are not guaranteed any remedy, refund, or compensation.

The regulatory status of cryptographic tokens and digital assets is currently unsettled, varies among jurisdictions and is subject to significant uncertainty. It is possible that in the future, certain laws, regulations, policies or rules relating to cryptographic tokens, digital assets, blockchain technology, or blockchain applications may be implemented which may directly or indirectly affect or restrict cryptographic token holders' right to acquire, own, hold, sell, convert, trade, or use cryptographic tokens.

The value of cryptographic tokens and digital assets may fluctuate significantly over a short period of time. The volatile and unpredictable fluctuations in price may result in significant losses, including the total loss of your investment, over a short period of time.

The uncertainty in tax legislation relating to cryptographic tokens and digital assets may expose cryptographic token holders to tax consequences associated with the use or trading of cryptographic tokens.

Digital assets and related products and services carry significant risks. Potential purchasers should take into account all of the above and assess the nature of, and their own appetite for, relevant risks independently and consult their advisers before making any decisions.

7.8 Professional advice

You should consult a lawyer, accountant, tax professional and/or any other professional advisors as necessary prior to determining whether to purchase, sell or otherwise use CDCETH, or embed CDCETH functionality within your applications.

7.9 Caution Regarding Forward-Looking Statements

This whitepaper contains certain forward-looking statements regarding the business we operate that are based on the belief of Crypto.com as well as certain assumptions made by and information available to Crypto.com. We do not purport to make any statements with respect to the conduct or operations of any third parties whose actions (including commercial activity) may affect the CDCETH protocol or any of the blockchain networks that it operates within. Forward-looking statements, by their nature, are subject to significant risks and uncertainties. Forward-looking statements may involve estimates and assumptions and are subject to risks, uncertainties and other factors beyond our control and prediction. Accordingly, these factors could cause actual results or outcomes that differ materially from those expressed in the forward-looking statements. Any forward-looking statement speaks only as of the date of which such statement is made, we undertake no obligation to update any forward-looking statements to reflect events or circumstances after the date on which such statement is made or to reflect the occurrence of unanticipated events.

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