MiCA White Paper

Solana (SOL)

Version 1.0
March 2025

White Paper in accordance with Markets in Crypto Assets Regulation (MiCAR) for the European Union (EU) & European Economic Area (EEA).

Purpose: seeking admission to trading in EU/EEA.

Prepared and Filed by LCX.com

NOTE: THIS CRYPTO-ASSET WHITE PAPER HAS NOT BEEN APPROVED BY ANY COMPETENT AUTHORITY IN ANY MEMBER STATE OF THE EUROPEAN UNION. THE PERSON SEEKING ADMISSION TO TRADING IS SOLELY RESPONSIBLE FOR THE CONTENT OF THIS CRYPTO-ASSET WHITE PAPER ACCORDING TO THE EUROPEAN UNION'S MARKETS IN CRYPTO-ASSET REGULATION (MICA).

LCX is voluntarily filing a **MiCA-compliant whitepaper for Solana (SOL)** as SOL is classified as "Other Crypto-Assets" under the Markets in Crypto-Assets Regulation (MiCA). Unlike Asset-Referenced Tokens (ARTs), Electronic Money Tokens (EMTs), or Utility Tokens, Solana does not legally require a MiCA whitepaper. However, MiCA allows service providers to publish a whitepaper voluntarily to enhance transparency, regulatory clarity, and investor confidence.As one of the most high-performance blockchain networks, Solana plays a critical role in the Web3 ecosystem, enabling scalable decentralized applications (dApps), smart contracts, and financial innovation. Solana's unique combination of Proof-of-Stake (PoS) and Proof-of-History (PoH) allows for high transaction throughput and low fees, making it an essential infrastructure for DeFi, NFTs, and blockchain-based applications.This whitepaper aims to provide a comprehensive regulatory disclosure, ensuring market participants have clear insights into Solana's functionality, risks, and role within the MiCA framework.

This document provides essential information about **Solana**'s characteristics, risks, and the framework under which LCX facilitates SOL-related services in compliance.

00 TABLE OF CONTENT

01 DATE OF NOTIFICATION

2025-03-13

COMPLIANCE STATEMENTS

02 This crypto-asset white paper has not been approved by any competent authority in any Member State of the European Union. The offeror of the crypto-asset is solely responsible for the content of this crypto-asset white paper.

Where relevant in accordance with Article 6(3), second subparagraph of Regulation (EU) 2023/1114, reference shall be made to ‘person seeking admission to trading’ or to ‘operator of the trading platform’ instead of ‘offeror’.

03 This crypto-asset white paper complies with Title II of Regulation (EU) 2023/1114 and, to the best of the knowledge of the management body, the information presented in the crypto-asset white paper is fair, clear and not misleading and the crypto-asset white paper makes no omission likely to affect its import.

04 The crypto-asset referred to in this white paper may lose its value in part or in full, may not always be transferable and may not be liquid.

05 False

06 The crypto-asset referred to in this white paper is not covered by the investor compensation schemes under Directive 97/9/EC of the European Parliament and of the Council.The crypto-asset referred to in this white paper is not covered by the deposit guarantee schemes under Directive 2014/49/EU of the European Parliament and of the Council.

SUMMARY

07 Warning

This summary should be read as an introduction to the crypto-asset white paper. The prospective holder should base any decision to purchase this crypto-asset on the content of the crypto-asset white paper as a whole and not on the summary alone. The offer to the public of this crypto-asset does not constitute an offer or solicitation to purchase financial instruments and any such offer or solicitation can be made only by means of a prospectus or other offer documents pursuant to the applicable national law.

This crypto-asset white paper does not constitute a prospectus as referred to in Regulation (EU) 2017/1129 of the European Parliament and of the Council (36) or any other offer document pursuant to Union or national law.

08 Characteristics of the crypto-asset

Solana's native crypto-asset, "SOL," is a utility token powering the Solana blockchain, a high-performance Layer 1 network. SOL is used for transaction fees, staking to secure the network, and interacting with decentralized applications (dApps). It provides access to smart contract execution, DeFi services, and governance participation in future upgrades. SOL has no inherent ownership, governance rights, enforceable claims, or guaranteed utility beyond its technical function within the Solana ecosystem.

09 Not applicable

10 Key information about the offer to the public or admission to trading

Solana (SOL) is a decentralized, open-market utility token, and as such, there is no centralized entity conducting an offer to the public. Solana Labs does not issue or control the supply of SOL but contributes to the development of the Solana ecosystem.

This whitepaper is prepared in compliance with MiCA regulations to provide transparency regarding SOL's listing and trading. Since SOL is already widely circulated and traded globally, this document does not represent a new issuance, public offering, or token sale but instead provides essential information about its admission to trading under the MiCA framework.

LCX facilitates the admission to trading of SOL on its regulated trading platform, ensuring compliance with MiCA regulations and providing a secure and transparent marketplace for SOL trading.

Total offer amount	Not applicable
Total number of tokens to be offered to the public	Not applicable
Subscription period	Not applicable
Minimum and maximum subscription amount	Not applicable
Issue price	Not applicable
Subscription fees (if any)	Not applicable
Target holders of tokens	Not applicable
Description of offer phases	Not applicable

CASP responsible for placing the token (if any)	Not applicable
Form of placement	Not applicable
Admission to trading	LCX AG, Herrengasse 6, 9490 Vaduz, Liechtenstein

A. PART A - INFORMATION ABOUT THE OFFEROR OR THE PERSON SEEKING ADMISSION TO TRADING

A.1 Name

LCX

A.2 Legal Form

AG

A.3 Registered Address

Herrengasse 6, 9490 Vaduz, Liechtenstein

A.4 Head Office

Herrengasse 6, 9490 Vaduz, Liechtenstein

A.5 Registration Date

24.04.2018

A.6 Legal Entity Identifier

529900SN07Z6RTX8R418

A.7 Another Identifier Required Pursuant to Applicable National Law

FL-0002.580.678-2

A.8 Contact Telephone Number

+423 235 40 15

A.9 E-mail Address

legal@lcx.com

A.10 Response Time (Days)

020

A.11 Parent Company

Not applicable

A.12 Members of the Management Body

Full Name	Business Address	Function
Monty C. M. Metzger	Herrengasse 6, 9490 Vaduz, Liechtenstein	President of the Board
Katarina Metzger	Herrengasse 6, 9490 Vaduz, Liechtenstein	Board Member
Anurag Verma	Herrengasse 6, 9490 Vaduz, Liechtenstein	Director of Technology

A.13 Business Activity

LCX provides various crypto-asset services under Liechtenstein's Token and Trusted Technology Service Provider Act ("Token- und Vertrauenswürdige Technologie-Dienstleister-Gesetz" in short "TVTG") also known as the Blockchain Act. These include custody and administration of crypto-assets, offering secure storage for clients' assets and private keys. LCX operates a trading platform, facilitating the matching of buy and sell orders for crypto-assets. It enables both crypto-to-fiat and crypto-to-crypto exchanges, ensuring compliance with AML and KYC regulations. LCX also supports token placements, marketing crypto-assets on behalf of offerors.

Under MiCA, LCX is classified as a Crypto-Asset Service Provider (CASP). LCX AG has applied for MiCA licensing on February 1, 2025, the first day of MiCA's implementation in Liechtenstein.

Under the TVTG framework, LCX provides:

- TT Depositary – Custody and safekeeping of crypto-assets.
- TT Trading Platform Operator – Operation of a regulated crypto-asset exchange.
- TT Exchange Service Provider – Crypto-to-fiat and crypto-to-crypto exchange.
- Token Issuer – Marketing and distribution of tokens.
- TT Transfer Service Provider – Crypto-asset transfers between ledger addresses.
- Token Generator & Tokenization Service Provider – Creation and issuance of tokens.
- Physical Validator – Enforcement of token-based rights on TT systems.
- TT Verification & Identity Service Provider – Legal capacity verification and identity registration.
- TT Price Service Provider – Providing aggregated crypto-asset price information.

A.14 Parent Company Business Activity

Not applicable

A.15 Newly Established

false

A.16 Financial Condition for the past three Years

LCX AG has a strong capital base, with CHF 1 million (approx. 1,126,000 USD) in share capital (Stammkapital) and a solid equity position (Eigenkapital) in 2023. The company has experienced fluctuations in financial performance over the past three years, reflecting the dynamic nature of the crypto market. While LCX AG recorded a loss in 2022, primarily due to a market downturn and a security breach, it successfully covered the impact through reserves. The company has remained financially stable, achieving revenues and profits in 2021, 2023 and 2024 while maintaining break-even operations.

In 2023 and 2024, LCX AG strengthened its operational efficiency, expanded its business activities, and upheld a stable financial position. Looking ahead to 2025, the company anticipates positive financial development, supported by market uptrends, an inflow of customer funds, and strong business performance. Increased adoption of digital assets and service expansion are expected to drive higher revenues and profitability, further reinforcing LCX AG's financial position.

A.17 Financial Condition Since Registration

LCX AG has been financially stable since its registration, supported by CHF 1 million in share capital (Stammkapital) and continuous business growth. Since its inception, the company has expanded its operations, secured multiple regulatory registrations, and established itself as a key player in the crypto and blockchain industry.

While market conditions have fluctuated, LCX AG has maintained strong revenues and break-even operations. The company has consistently reinvested in its platform, technology, and regulatory compliance, ensuring long-term sustainability. The LCX Token has been a fundamental part of the ecosystem, with a market capitalization of approximately $200 million USD and an all-time high exceeding $500 million USD in 2022. Looking ahead, LCX AG anticipates continued financial growth, driven by market uptrends, increased adoption of digital assets, and expanding business activities.

B. PART B - INFORMATION ABOUT THE ISSUER, IF DIFFERENT FROM THE OFFEROR OR PERSON SEEKING ADMISSION TO TRADING

B.1 Issuer different from offeror or person seeking admission to trading

false

B.2 Name

Not applicable

B.3 Legal Form

Not applicable

B.4 Registered Address

Not applicable

B.5 Head Office

Not applicable

B.6 Registration Date

Not applicable

B.7 Legal Entity Identifier

Not applicable

B.8 Another Identifier Required Pursuant to Applicable National Law

Not applicable

B.9 Parent Company

Not applicable

B.10 Members of the Management Body

Not applicable

B.11 Business Activity

Not applicable

B.12 Parent Company Business Activity

Not applicable

C. PART C - INFORMATION ABOUT THE OPERATOR OF THE TRADING PLATFORM IN CASES WHERE IT DRAWS UP THE CRYPTO-ASSET WHITE PAPER AND INFORMATION ABOUT OTHER PERSONS DRAWING THE CRYPTO-ASSET WHITE PAPER PURSUANT TO ARTICLE 6(1), SECOND SUBPARAGRAPH, OF REGULATION (EU) 2023/1114

C.1 Name

LCX AG

C.2 Legal Form

AG

C.3 Registered Address

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C.5 Registration Date

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C.7 Another Identifier Required Pursuant to Applicable National Law

FL-0002.580.678-2

C.8 Parent Company

Not Applicable

C.9 Reason for Crypto-Asset White Paper Preparation

LCX is voluntarily preparing this MiCA-aligned whitepaper for Solana (SOL) to enhance transparency, regulatory clarity, and investor confidence. As Solana is classified as an “Other Crypto-Asset” under MiCA Article 4(2), a white paper is not required for its offering or trading. However, LCX is providing this document as part of its commitment to regulatory best practices and transparency.

LCX has applied for authorization as a Crypto-Asset Service Provider (CASP) and is aligning its operations with MiCA requirements while facilitating SOL trading on its platform. This white paper serves to provide clear, standardized information about SOL for users and investors, even though it is not a MiCA requirement.

C.10 Members of the Management Body

Full Name	Business Address	Function
Monty C. M. Metzger	Herrengasse 6, 9490 Vaduz, Liechtenstein	President of the Board
Katarina Metzger	Herrengasse 6, 9490 Vaduz, Liechtenstein	Board Member
Anurag Verma	Herrengasse 6, 9490 Vaduz, Liechtenstein	Director of Technology

C.11 Operator Business Activity

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“TVTG”) also known as the Blockchain Act. These include custody and administration of crypto-assets, offering secure storage for clients' assets and private keys. LCX operates a trading platform, facilitating the matching of buy and sell orders for crypto-assets. It enables both crypto-to-fiat and crypto-to-crypto exchanges, ensuring compliance with AML and KYC regulations. LCX also supports token placements, marketing crypto-assets on behalf of offerors.

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- TT Verification & Identity Service Provider – Legal capacity verification and identity registration.
- TT Price Service Provider – Providing aggregated crypto-asset price information.

C.12 Parent Company Business Activity

Not Applicable

C.13 Other persons drawing up the white paper under Article 6 (1) second subparagraph MiCA

Not Applicable

C.14 Reason for drawing up the white paper under Article 6 (1) second subparagraph MiCA

Not Applicable

D. PART D - INFORMATION ABOUT THE CRYPTO-ASSET PROJECT

D.1 Crypto-Asset Project Name

Solana

D.2 Crypto-Assets Name

Solana

D.3 Abbreviation

SOL

D.4 Crypto-Asset Project Description

Solana is a high-performance blockchain platform created to support scalable decentralized applications (dApps) and crypto-assets. Launched in 2020, the Solana project introduced a blockchain that can deliver extremely fast transaction processing times and low transaction costs by innovating at the consensus layer. Solana's network uses a combination of Proof-of-Stake (PoS) consensus and an original timekeeping mechanism called Proof-of-History (PoH) to order and validate transactions. This design allows Solana to finalize transactions in near real-time (often within a second) and achieve throughput on the order of thousands to tens of thousands of transactions per second in practice, with the capability for much higher throughput as hardware and network bandwidth scale.

D.5 Details of all persons involved in the implementation of the crypto-asset project

Solana is an open-source blockchain with no central issuer. It is maintained by a decentralizednetwork of developers, validators, node operators, and users worldwide. The Solana Foundation and other independent contributors drive its development.

Full Name	Business Address	Function
Anatoly Yakovenko	*Not applicable*	*Co-founder & Early Developer*
Solana Foundation	*Global*	*Development & Ecosystem Support*
Solana Core Developers	*Global*	*Software Development & Maintenance*
Solana Validators	*Global*	*Transaction Validation & Security (PoS)*
Solana Node Operators	*Global*	*Network Verification & Governance*

D.6 Utility Token Classification

false

D.7 Key Features of Goods/Services for Utility Token Projects

Not applicable

D.8 Plans for the Token

Not applicable

D.9 Resource Allocation

Not applicable

D.10 Planned Use of Collected Funds or Crypto-Assets

Not applicable

E. PART E - INFORMATION ABOUT THE OFFER TO THE PUBLIC OF CRYPTO-ASSETS OR THEIR ADMISSION TO TRADING

E.1 Public Offering or Admission to Trading

ATTR

E.2 Reasons for Public Offer or Admission to Trading

LCX is voluntarily filing a MiCA-compliant whitepaper for Solana (SOL)to enhance transparency, regulatory clarity, and investor confidence. While SOL is classified as “Other Crypto-Assets” under MiCA and does not require a whitepaper, this initiative supports compliance readiness and aligns with MiCA’s high disclosure standards. By doing so, LCX strengthens its position as a regulated exchange, ensuring a trustworthy and transparent trading environment for Solana within the EU’s evolving regulatory framework. Additionally, this filing facilitates market access and institutional adoption by removing uncertainty for institutional investors and regulated entities seeking to engage with Solana in a compliant manner. It further supports the broader market adoption and integration of Solana into the regulated financial ecosystem, reinforcing LCX’s role in shaping compliant and transparent crypto markets.

E.3 Fundraising Target

Not applicable

E.4 Minimum Subscription Goals

Not applicable

E.5 Maximum Subscription Goal

Not applicable

E.6 Oversubscription Acceptance

Not applicable

E.7 Oversubscription Allocation

Not applicable

E.8 Issue Price

Not applicable

E.9 Official Currency or Any Other Crypto-Assets Determining the Issue Price

Not applicable

E.10 Subscription Fee

Not applicable

E.11 Offer Price Determination Method

Not applicable

E.12 Total Number of Offered/Traded Crypto-Assets

As of March 2025, approximately 508.7 million SOL tokens are in circulation out of a current total supply of about 595.6 million SOL.Solana’s tokenomics are inflationary – new SOL are continually minted to reward validators for securing the network. The inflation rate started at about 8% in Solana’s early launch and is decreasing by 15% each year, targeting a long-term annual inflation rate of 1.5%. There is no hard capped maximum supply for SOL; instead, the supply grows at a known disinflationary schedule. Some portion of SOL’s supply is held by early contributors, Solana Labs, and the Solana Foundation (subject to various vesting schedules), and another portion is actively staked by validators and delegators

E.13 Targeted Holders

ALL

E.14 Holder Restrictions

Not applicable

E.15 Reimbursement Notice

Not applicable

E.16 Refund Mechanism

Not applicable

E.17 Refund Timeline

Not applicable

E.18 Offer Phases

Not applicable

E.19 Early Purchase Discount

Not applicable

E.20 Time-Limited Offer

Not applicable

E.21 Subscription Period Beginning

Not applicable

E.22 Subscription Period End

Not applicable

E.23 Safeguarding Arrangements for Offered Funds/Crypto-Assets

Not applicable

E.24 Payment Methods for Crypto-Asset Purchase

Not applicable

E.25 Value Transfer Methods for Reimbursement

Not applicable

E.26 Right of Withdrawal

Not applicable

E.27 Transfer of Purchased Crypto-Assets

Not applicable

E.28 Transfer Time Schedule

Not applicable

E.29 Purchaser's Technical Requirements

Not applicable

E.30 Crypto-asset service provider (CASP) name

Not applicable

E.31 CASP identifier

Not applicable

E.32 Placement Form

NTAV

E.33 Trading Platforms name

LCX AG

E.34 Trading Platforms Market Identifier Code (MIC)

LCXE

E.35 Trading Platforms Access

SOL is widely traded on numerous cryptocurrency exchanges globally (both regulated and unregulated). As a decentralized asset, SOL is not confined to any single trading venue; it can be accessed by retail and institutional investors worldwide through dozens of exchanges. LCX Exchange now supports SOL trading (pair SOL/EUR). To access SOL trading on LCX, users must have an LCX account and complete the platform's KYC verification, as LCX operates under strict compliance standards. Trading on LCX is available via its web interface and APIs to verified customers.

E.36 Involved Costs

Not applicable

E.37 Offer Expenses

Not applicable

E.38 Conflicts of Interest

Not applicable

E.39 Applicable Law

Not applicable – SOL as a crypto-asset itself is not governed by any specific national law or jurisdiction. Solana is a decentralized network that operates on a global scale, and SOL tokens exist on the blockchain independent of legal jurisdiction. There is no contractual framework (like an investment contract or debt instrument) attached to SOL that would be subject to a governing law clause.

E.40 Competent Court

In case of disputes related to services provided by LCX, the competent court is: The Courts of Liechtenstein, with jurisdiction in accordance with Liechtenstein law and applicable EU regulations.

F. PART F - INFORMATION ABOUT THE CRYPTO-ASSETS

F.1 Crypto-Asset Type

Other Crypto-Asset

F.2 Crypto-Asset Functionality

SOL is a decentralized digital asset that powers the Solana blockchain. Its primary functionalities include: (a) Transaction Fee Payment: SOL is used to pay for transaction fees and smart contract execution fees on the Solana network. Every operation on Solana (transfer, contract call, etc.) requires a small SOL fee, which helps prevent spam and rewards validators. (b) Staking and Network Security: SOL can be staked (bonded) with network validators to secure the PoS consensus. By staking SOL, holders either run a validator node or delegate to a validator; this supports network security and in return yields staking rewards in SOL.

F.3 Planned Application of Functionalities

SOL is already fully functional and integrated into the Solana network's operations. There are no new planned uses of SOL outside its current role, as its role is fundamental and ongoing. It will continue to be used as: the gas token for all transactions on Solana; the staking asset for validators (and delegation by token holders) to keep the network secure; and the base asset for the ecosystem's DeFi and commerce.

F.4 Type of white paper

OTHR

F.5 The type of submission

NEWT

F.6 Crypto-Asset Characteristics

Solana's SOL token is a decentralized, permissionless blockchain token designed for high-speed and low-cost on-chain transactions. Key characteristics include:

Blockchain Platform: SOL operates on the Solana blockchain, a high-throughput, open-source ledger that achieves scalability through technical innovations like Proof-of-History. Transactions on Solana achieve finality extremely quickly (sub-second) and the network can handle a large volume without significant delays.This sets Solana apart from earlier blockchains and positions SOL as a fast-settlement asset.

Consensus Mechanism: Unlike Proof-of-Work blockchains (e.g., Bitcoin) that require energy-intensive mining, Solana uses a Proof-of-Stake consensus augmented by Proof-of-History timestamps, which allows validators to reach consensus efficiently and in order. This means SOL does not require mining; instead, validators stake SOL and use cryptographic time proofs to validate blocks. This approach is highly energy-efficient relative to PoW.

Transaction Costs: Solana's design yields extremely low transaction fees – often around 0.000005 SOL per simple transaction (which is roughly $0.0001–$0.001 depending on SOL's market price). Low fees make microtransactions and high-volume applications economically feasible on Solana.

F.7 Commercial name or trading name

Solana

F.8 Website of the issuer

Not applicable

F.9 Starting date of offer to the public or admission to trading

2025-01-01

F.10 Publication date

2025-04-02

F.11 Any other services provided by the issuer

Not applicable

F.12 Identifier of operator of the trading platform

LCXE

F.13 Language or languages of the white paper

English

F.14 Digital Token Identifier Code used to uniquely identify the crypto-asset or each of the several crypto assets to which the white paper relates, where available

20J63Z4N3

F.15 Functionally Fungible Group Digital Token Identifier, where available

Not applicable

F.16 Voluntary data flag

true

F.17 Personal data flag

false

F.18 LEI eligibility

false

F.19 Home Member State

Liechtenstein

F.20 Host Member States

Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

G. PART G - INFORMATION ON THE RIGHTS AND OBLIGATIONS ATTACHED TO THE CRYPTO-ASSETS

G.1 Purchaser Rights and Obligations

Purchasers or holders of SOL do not acquire any specific contractual rights or legal claims against an issuer or anyone else by holding the token. SOL is a decentralized network token, not a share or debt instrument; therefore, owning SOL grants no governance rights in a legal entity, no entitlement to dividends, profits, or any form of interest, and no claim on any underlying assets or collateral.

G.2 Exercise of Rights and Obligation

Because holding SOL does not bestow contractual rights, there is no traditional “exercise” of rights as one might have with a security or utility token tied to services. The rights that do exist (use of the network) are exercised simply by using the token: e.g., to exercise the “right” to transfer SOL, the holder creates a transaction and signs it with their private key; to exercise the “right” to stake, the holder delegates their SOL to a validator via a staking transaction. These actions are carried out on-chain and are validated by the decentralized network.

G.3 Conditions for Modifications of Rights and Obligations

Since there are no formal contractual rights attached to SOL, modifications in the “rights and obligations” sense mostly pertain to changes in the protocol rules of the Solana network. Any changes to how SOL works (for example, changes to staking yield, fee structure, or adding on-chain governance features in the future) would require a network upgrade. Solana’s upgrade process is decentralized: core developers may propose changes via software updates, but these changes only take effect if a sufficient portion of the community (especially validators) adopts the new software version.

G.4 Future Public Offers

Not applicable

G.5 Issuer Retained Crypto-Assets

Not applicable

G.6 Utility Token Classification

No

G.7 Key Features of Goods/Services of Utility Tokens

Not applicable

G.8 Utility Tokens Redemption

Not applicable

G.9 Non-Trading Request

True

G.10 Crypto-Assets Purchase or Sale Modalities

Not applicable

G.11 Crypto-Assets Transfer Restrictions

Not applicable

G.12 Supply Adjustment Protocols

Solana’s supply policy is governed by protocol-level rules, ensuring predictable and structured token issuance without discretionary changes by any centralized entity. Unlike fixed-supply assets, Solana does not have a hard cap on its total supply. Instead, its monetary policy follows a predefined inflation schedule that is coded into the network and automatically enforced by the protocol.

Supply adjustments occur through automated issuance and deflationary mechanisms, with no governance-based modifications required. While Solana's protocol determines the inflation rate, the community can influence economic parameters (such as transaction fee distribution) through on-chain governance proposals. However, the fundamental supply model remains fixed at the protocol level, with all adjustments occurring according to predefined rules.

Solana's network ensures full transparency in its supply management, allowing stakeholders to track real-time issuance and supply changes via public blockchain data. These rules provide long-term predictability, balancing security incentives for validators with sustainable token economics.

G.13 Supply Adjustment Mechanisms

Solana's supply dynamically adjusts based on inflationary issuance and deflationary fee burning, ensuring a balance between validator rewards and network sustainability.

Inflationary Issuance:

- At network launch, 500 million SOL were pre-minted.
- The protocol initially set an inflation rate of 8% per year, which decreases over time.
- Over the long term, inflation is set to stabilize at 1.5% per year, ensuring ongoing validator incentives without excessive supply expansion.

Deflationary Fee Burning:

- 50% of all transaction fees are permanently burned, reducing the circulating supply.
- This process helps counteract inflationary issuance, creating a self-regulating economic model.

Automated Protocol Adjustments:

- All supply changes occur automatically based on pre-set network rules.
- No central entity or governance vote can arbitrarily mint new tokens or modify the supply model.

By combining controlled inflation with deflationary burning, Solana maintains an adaptive monetary system that supports long-term economic sustainability and network security.

G.14 Token Value Protection Schemes

False

G.15 Token Value Protection Schemes Description

Not Applicable

G.16 Compensation Schemes

False

G.17 Compensation Schemes Description

Not Applicable

G.18 Applicable Law

Not applicable – As previously noted, Solana (SOL) is not governed by any specific national contract or securities law as an instrument. The rights of SOL holders are defined by code (Solana protocol) and not by a contract enforceable in court.

G.19 Competent Court

Not applicable - As Solana (SOL) is a decentralized, open-source crypto-asset with no central issuer or governing entity, it does not fall under the jurisdiction of any specific legal framework.

In case of disputes related to services provided by LCX, the competent court is: The Courts of Liechtenstein, with jurisdiction in accordance with Liechtenstein law and applicable EU regulations.

H. PART H – INFORMATION ON THE UNDERLYING TECHNOLOGY

H.1 Distributed ledger technology

Solana is a public, permissionless blockchain designed for high-speed, high-throughput transaction processing. Unlike traditional blockchains that rely on sequential block production, Solana integrates Proof-of-History (PoH), a cryptographic verifiable delay function (VDF) that orders transactions before consensus, reducing latency and increasing efficiency.

The Solana ledger is maintained by a decentralized network of validator nodes with no central coordinator. Block production occurs approximately every 400 milliseconds, and transaction finality is typically achieved in under a second.

Solana uses Tower BFT consensus, an optimized Proof-of-Stake (PoS) mechanism, which leverages PoH timestamps to structure validator voting and reduce communication overhead. This process ensures fast transaction confirmation while maintaining security and consistency across the network.

Solana's ledger supports smart contract execution, allowing it to function as a generalized state machine that records programmatic state changes beyond basic transactions.

Technical Features of Solana's DLT

- Turbine – A block propagation protocol that divides data into smaller packets for more efficient transmission.
- Gulf Stream – A mempool-less transaction forwarding protocol that preemptively routes transactions to validators.
- Sealevel – A parallel smart contract execution engine that enables concurrent transaction processing.
- Pipelining – A transaction validation model that segments processing into sequential steps for efficiency.
- Cloudbreak – A horizontally scalable accounts database that manages concurrent read/write operations.
- Archivers – A system for offloading and storing historical ledger data separate from validator nodes.

These technical components allow Solana's distributed ledger to maintain high performance while processing large transaction volumes.

Security, Decentralization, and Open-Source Transparency

Solana's consensus model is designed to ensure network integrity while reducing potential centralization risks. The validator network is globally distributed across multiple data centers, and Tower BFT enforces cryptographic security through validator stake commitments.

The blockchain is open-source and released under the Apache 2.0 license, with the full codebase publicly available on GitHub. This ensures transparency, auditability, and external security review.

Solana has processed high transaction volumes under real-world conditions, but the network has also experienced periodic congestion and temporary outages (see Risks section). Ongoing protocol refinements continue to address performance and stability challenges.

Solana Whitepaper: https://solana.com/solana-whitepaper.pdf

Public block explorer: https://solscan.io/

Solana Main repository: https://github.com/solana-labs/solana

Solana Developer portal: https://solana.com/developers

H.2 Protocols and Technical Standards

Solana operates on a custom Layer-1 blockchain protocol with several technical standards integral to its functionality. These standards define how transactions are processed, consensus is reached, and smart contracts interact with the network.

Consensus Protocol

Solana's consensus mechanism is a hybrid of Proof-of-Stake (PoS) and Proof-of-History (PoH), optimized for high-speed and efficient transaction finality.

- Tower BFT: A custom implementation of Practical Byzantine Fault Tolerance (pBFT), leveraging PoH timestamps to reduce validator communication overhead. Validators rotate based on a leader schedule derived from stake distribution and PoH sequencing. A block reaches finality once two-thirds (supermajority) of stake-weighted votes have been committed.

- Proof-of-History (PoH): A verifiable delay function (VDF) that timestamps transactions before they enter consensus. Each block producer must include a PoH-generated hash as proof of the time at which it was created, allowing nodes to independently verify transaction order without requiring direct communication.

This approach significantly reduces latency and enables Solana to achieve sub-second finality while tolerating up to one-third of malicious validators without compromising ledger integrity.

Transaction Processing Standards

Solana uses a parallel transaction execution model to maximize throughput:

- Sealevel: A smart contract execution engine that processes multiple transactions in parallel by allowing contracts to declare which state accounts they will access upfront, avoiding conflicting writes.

- Pipelining: A segmented transaction processing system that divides tasks into stages (fetch, signature verification, execution, and state updates), ensuring efficient block validation.

Solana transactions can include multiple instructions per call and require explicit access lists for state changes, differing from Ethereum's sequential execution model.

Smart Contract Standards

Solana's smart contract architecture supports tokenization and NFT standards:

- SPL Token Standard: Equivalent to Ethereum's ERC-20, the Solana Program Library (SPL) token standard governs the issuance, minting, and transfer of fungible tokens (e.g., USDC-SPL, wrapped BTC).

- Metaplex Token Metadata Standard: Built on SPL tokens, this defines NFT metadata, ensuring compatibility with wallets and marketplaces.

- Solana Program Model: Smart contracts are deployed as on-chain programs written in Rust or C, compiled to Berkeley Packet Filter (BPF) bytecode. Programs are immutable unless deployed with an upgradeable loader, which allows controlled modifications by an authorized entity.

Interoperability and Cryptographic Standards

- Signature & Hashing Algorithms:
- Ed25519 for transaction signatures (same as Stellar and NEAR).
- SHA-256 for PoH and other hashing needs.
- Addressing Format: Base58-encoded public keys for accounts.

- Cross-Chain Compatibility: Emerging standards include Solana Name Service (SNS) and bridging protocols like Wormhole, which facilitates interoperability with Ethereum and other chains.

Network Communication & Validator Coordination

- Gossip Protocols: Validator communication is built on libp2p and optimized for high-throughput UDP-based messaging.
- Turbine: A block propagation mechanism that splits data into smaller packets, allowing efficient distribution across the network.
- Gulf Stream: A mempool-less transaction forwarding system, which preemptively routes transactions to validators, reducing confirmation delays.

Security and Governance Standards

- Replay Protection: Transactions include a recent blockhash + durable nonce to prevent replay attacks and ensure transaction uniqueness.
- Validator Rewards & Slashing:
- Validators earn rewards based on vote transactions rather than block production.
- Solana currently does not implement slashing for validator misbehavior, but mechanisms exist for penalizing double-signing or malicious activity in the future.
- Governance:
- Solana currently lacks a formal on-chain governance mechanism for protocol upgrades.
- DAO-based governance exists for specific applications and token projects using the SPL Governance Program, but not for core protocol decisions.

Consensus Mechanism & Validator Decentralization

Solana's PoS + PoH consensus model relies on a leader-based block production system, where validators stake SOL to participate in consensus. The leader schedule is randomly assigned based on stake-weighted selection, ensuring decentralized participation in block production.

- Validator Independence:
- Over 1,800 validators operate globally, distributed across multiple regions and data centers.
- The Nakamoto coefficient (number of validators needed to control 33% of stake) was around 30 as of late 2023, indicating an improving decentralization profile.

Solana's consensus ensures deterministic finality, meaning transactions do not rely on probabilistic confirmations (as in Proof-of-Work networks). Instead, once a block is finalized by a supermajority of votes, it is irreversible.

H.3 Technology Used

Solana utilizes widely adopted cryptographic standards, including Ed25519 for transaction signatures—where each Solana address corresponds to an Ed25519 public key—and SHA-256 for Proof-of-History (PoH) and hash-based identity verification.

Validators employ high-performance hardware, including NVMe SSDs and large-memory configurations, optimized for memory-mapped file access to retrieve account states efficiently. Due to the high computational demands of consensus and PoH, validators frequently utilize GPUs to accelerate Ed25519 signature verification, enabling the network to process thousands of transactions per second.

While PoH remains CPU-bound by design to prevent manipulation of timekeeping, GPUs assist with:

- Bulk signature verification, reducing computational overhead.
- Erasure coding in Turbine, which improves data redundancy and recovery.

For network communication, Solana heavily utilizes the UDP protocol due to its lightweight and low-latency properties. To mitigate packet loss risks, Solana implements forward-error correction (erasure coding) in Turbine, allowing efficient block propagation even in unreliable network conditions.

H.4 Consensus Mechanism

Solana's consensus mechanism is a Byzantine Fault Tolerant (BFT) Proof-of-Stake (PoS) system enhanced by Proof-of-History (PoH). Validators participate in weighted voting based on stake, with PoH acting as a global time source to streamline consensus.

Leader Selection

- The leader schedule is deterministic, precomputed for each epoch (~2 days) based on stake weight.
- Each slot (~400ms) has a designated leader responsible for producing a block.
- If a leader fails to produce a block, the next scheduled leader proceeds after the slot duration, ensuring the network continues operating (although the missed slot remains empty).

Voting & Finality

- Validators verify transactions and submit vote transactions referencing the latest confirmed block.
- Tower BFT enforces a lockout mechanism, meaning each vote also implicitly confirms all previous blocks and extends the lockout period for those blocks.
- If a validator votes on a competing fork, it breaks the lock and risks penalties (though slashing is not actively enforced yet).
- A block is finalized once it accumulates enough stake-weighted votes, making it economically unfeasible to revert unless more than 1/3 of validators act maliciously.
- The network designates a rooted block—the oldest block with 2/3+ supermajority confirmation—as the new ledger root, ensuring finality for all prior blocks.

Integration of Proof-of-History (PoH)

- PoH serves as a cryptographic timestamping mechanism, allowing validators to verify the order of events without requiring additional rounds of communication.
- The leader includes the current PoH hash in each block, ensuring that validators can determine the correct sequence of blocks relative to others.
- This process significantly reduces latency and increases throughput, as validators do not need to synchronize timestamps through conventional consensus rounds.

H.5 Incentive Mechanisms and Applicable Fees

Solana's economic model is structured to incentivize network security, staking participation, and efficient transaction processing while maintaining low fees for users. Validators, responsible for producing blocks and securing the network, earn staking rewards through an inflationary issuance of SOL tokens. As of 2025, the annualized inflation rate is approximately 4.68% and is set to decrease yearly, following a predefined monetary policy. Validators receive rewards in proportion to the amount of SOL staked with them, which includes both their own stake and delegated tokens from other users. To compensate for their services, validators can set a commission fee, typically ranging between 5-10%, which is deducted from the rewards distributed to delegators. This mechanism ensures that validators remain incentivized to provide reliable uptime and performance, as missed votes lead to lower rewards. At the same time, token holders are encouraged to stake their SOL rather than hold it idle, as staking provides additional rewards while contributing to the network's security.

Solana's transaction fee model is designed to be cost-effective, making the network suitable for high-frequency use cases such as payments, gaming, and decentralized applications. The fees for a basic transaction are typically a fraction of a cent, around 0.000005 SOL. Every transaction includes a fee that is deducted from the sender's account. Half of the collected transaction fees are burned, permanently reducing the total SOL supply, while the other half is allocated to the validator that processes the transaction. This system introduces a deflationary element, offsetting inflation over time, especially as network activity increases. While current fee burning represents only a minor reduction in the overall supply, higher transaction volumes in the future could lead to greater deflationary effects, potentially balancing or even surpassing new token issuance.

Validators on Solana are currently subject to minimal penalties. Unlike some Proof-of-Stake blockchains that enforce slashing for downtime or incorrect behavior, Solana's current model does not slash validators who are offline, although they simply do not earn rewards while inactive. Slashing for double-signing exists as a deterrent but has not been actively enforced as of 2025. Future governance proposals may introduce stricter penalties, particularly for prolonged validator inactivity, to further ensure the reliability of the network.

Solana also implements a mechanism related to account storage, which previously involved an ongoing rent fee for maintaining an account on-chain. This has since been replaced with a requirement for accounts to maintain a minimum SOL balance to remain active. If an account balance falls below this rent-exempt threshold, its funds may be reclaimed and burned, adding another deflationary aspect to Solana's tokenomics. Most wallet applications handle this process automatically by ensuring that new accounts are funded with the required minimum SOL, making the mechanism seamless for users.

The broader economic alignment of Solana ensures that validators, token holders, and network participants share common incentives. Validators benefit from higher transaction volumes as they collect fees, while SOL holders gain from a secure and efficient network that supports a wide range of applications. As of early 2025, over 70% of SOL's circulating supply is staked, strengthening economic security and reducing token liquidity, which can help stabilize price fluctuations. The combination of decreasing inflation, fee burning, and high staking participation leads to a monetary policy that ensures sustainable token issuance. If transaction volumes continue to rise significantly, fee burning could play a larger role in offsetting new issuance, potentially bringing net inflation close to zero or even negative in certain periods of high network activity.

H.6 Use of Distributed Ledger Technology

False

H.7 DLT Functionality Description

Not applicable

H.8 Audit

False

H.9 Audit Outcome

Not applicable

I. PART I – INFORMATION ON RISKS

I.1 Offer-Related Risks

The admission to trading of Solana (SOL) is subject to risks related to market volatility, regulatory developments, and trading conditions. While SOL is actively traded on global exchanges and generally has high liquidity, its price can fluctuate significantly due to factors such as macroeconomic conditions, investor sentiment, technological advancements, and speculative trading activity.

Liquidity risks may arise from changing market conditions, regulatory actions, or exchange delistings, which could impact the ease of buying or selling SOL at expected prices. Additionally, regulatory developments in different jurisdictions may introduce new compliance obligations, trading restrictions, or limitations on market access, potentially affecting the availability of SOL for trading.

Broader financial and cryptocurrency market risks, such as systemic downturns, operational failures of key exchanges, or security breaches, could further impact trading stability. As the regulatory landscape evolves, there is a risk that new legal requirements or enforcement actions could affect SOL's trading status, influencing investor access and market conditions.

I.2 Issuer-Related Risks

Solana does not have a central issuer comparable to a company that could default or become insolvent, as would be the case with traditional securities or debt instruments. However, the broader Solana ecosystem involves various entities, stakeholders, and infrastructure providers whose actions or inactions could introduce risks.

Regulatory and Legal Uncertainty: While Solana itself is a decentralized blockchain, the regulatory treatment of exchanges, custodians, staking services, and decentralized applications (dApps) built on Solana varies across jurisdictions. Changes in legal frameworks may impact the accessibility, trading, and use of SOL, potentially affecting liquidity and market stability.

Network Governance and Protocol Risks: Solana's protocol upgrades and governance decisions are primarily influenced by core developers, the validator community, and the Solana Foundation. While this model allows for rapid innovation and network improvements, governance decisions may be subject to disagreements, delays, or unexpected changes in network rules. In certain scenarios, network-wide upgrades could introduce unintended technical issues or lead to forks if consensus is not reached.

Validator and Staking Centralization Risks: As a Proof-of-Stake (PoS) blockchain, Solana relies on validators to secure the network and process transactions. If staking power becomes too concentrated among a small number of validators or staking service providers, it could introduce risks related to network control, governance influence, and censorship resistance.

Security and Technological Risks: Solana's high-performance architecture and smart contract execution capabilities introduce technical complexity and security considerations. Vulnerabilities in smart contract code, validator software, or underlying cryptographic mechanisms could lead to exploits, financial losses, or network disruptions. Additionally, advancements in quantum computing or other emerging technologies could pose long-term risks to Solana's cryptographic security model if not mitigated through future upgrades.

I.3 Crypto-Assets-Related Risks

Solana (SOL) is a decentralized digital asset with no central issuer, reducing risks typically associated with centrally controlled crypto-assets. However, trading, holding, and using SOL involves several inherent risks.

Market Risk: The price of SOL is highly volatile, influenced by macroeconomic trends, investor sentiment, regulatory developments, and technological advancements. Market fluctuations can lead to significant gains or losses, and trading conditions may be impacted by broader financial market instability or shifts in demand for digital assets.

Liquidity Risk: While Solana generally maintains high liquidity across major exchanges and decentralized finance (DeFi) platforms, extreme market conditions, regulatory actions, or changes in exchange policies could reduce market accessibility and affect trading volumes, potentially leading to increased price slippage or temporary illiquidity.

Custodial and Self-Custody Risks: Ownership of SOL requires secure private key management, as the loss or compromise of private keys results in the permanent loss of assets. Users storing SOL on centralized exchanges or custodial platforms face counterparty risks, including exchange insolvency, hacking incidents, operational failures, or regulatory intervention that may affect asset availability.

Regulatory and Taxation Risks: Solana operates across multiple regulatory jurisdictions, each with varying rules on taxation, securities classification, and compliance requirements. Future regulatory developments could impact the use of SOL in DeFi, staking, or smart contract applications, potentially leading to new legal obligations, restrictions, or enforcement actions affecting asset utility and adoption.

Smart Contract and Protocol Risks: Solana supports decentralized applications (dApps) and smart contracts, which introduces risks associated with software vulnerabilities, coding errors, and potential exploits. Flaws in smart contracts or protocol-level logic may lead to security breaches, financial losses, or disruptions in network functionality.

Network Security and Governance Risks: The stability and security of the Solana network depend on its validator network, governance model, and upgrade processes. Potential risks include validator centralization, governance disputes over protocol changes, or unforeseen security vulnerabilities affecting smart contract execution. These factors could impact network reliability or raise concerns about decentralization and control.

Quantum Computing Threats: Advances in quantum computing may pose long-term risks to cryptographic security, potentially affecting key management, transaction signing mechanisms, and overall network integrity. While current cryptographic standards remain secure, ongoing research and potential future upgrades may be required to mitigate emerging threats.

I.4 Project Implementation-Related Risks

Solana, as a decentralized, open-source blockchain, relies on continuous protocol upgrades, validator participation, and network optimizations to maintain performance and adoption. However, several implementation risks may affect its scalability, governance, and technical execution.

Protocol Development and Upgrade Risks: Solana's network upgrades require broad validator and developer consensus. Delays, software bugs, or governance disputes could impact upgrade rollouts, potentially leading to network inefficiencies or temporary forks if consensus is not reached. Unexpected software failures in protocol updates could also introduce security vulnerabilities or cause disruptions in transaction processing.

Scalability and Network Performance Challenges: While Solana is designed for high transaction throughput, past congestion events have demonstrated scalability limitations during peak demand. If transaction volumes continue to rise faster than infrastructure improvements, network latency, failed transactions, or fee spikes could become recurring issues.

Validator and Staking Centralization Risks: Solana's Proof-of-Stake consensus relies on validators to secure the network and confirm transactions. If staking power becomes concentrated among a small group of validators or centralized staking services, it could reduce decentralization and security, potentially making the network more vulnerable to collusion or censorship risks. Additionally, validator hardware requirements are high, which may limit broader participation.

Security Risks in Network Upgrades: Changes to Solana's core protocol introduce potential risks, including unintended software bugs, vulnerabilities in consensus mechanisms, or issues with validator synchronization. If an upgrade were to introduce a critical flaw, the network might require rapid patches or rollbacks, which could disrupt transaction processing.

I.5 Technology-Related Risks

Solana's blockchain infrastructure is designed for high-speed transaction processing and scalability, but it carries certain technology-related risks that could impact network security, decentralization, and reliability. These risks include potential software vulnerabilities, validator infrastructure dependencies, transaction congestion, and interoperability challenges.

Network Security and Potential Attacks

Solana's Proof-of-Stake (PoS) consensus with Tower BFT is designed to be secure against known attack vectors as long as less than one-third of stake is controlled by malicious entities. However, evolving attack strategies could introduce new risks. One such scenario is a long-range attack, where an attacker gains control of old validator keys to attempt a deep chain reorganization. While Solana mitigates this through economic disincentives, validator warm-ups, and slashing risks, a coordinated attack or a zero-day exploit affecting multiple validators simultaneously could lead to double-signing or network forks. Though highly unlikely, such an event could disrupt consensus and require emergency protocol intervention.

Software Bugs and Protocol Vulnerabilities

As with any complex software, critical bugs in Solana's core protocol could lead to network disruptions, security vulnerabilities, or unintended economic consequences. A severe exploit—such as one allowing bypassing of signature verification or unauthorized SOL minting—would have major implications for the network. While no such vulnerabilities have been exploited at the base layer, past software issues have contributed to temporary network outages. Solana employs security audits and formal verification techniques for critical components, but not the entire codebase. The use of high-performance programming languages like Rust and C introduces additional complexity, making thorough security testing essential to prevent exploits.

Validator Hardware Centralization and Infrastructure Dependence

Solana's validators require high-performance hardware, including multi-core CPUs, large memory capacity, and NVMe SSDs, making it more expensive to participate in block validation compared to other PoS networks. Due to these requirements, many validators operate in data centers or cloud services, with a significant portion hosted on platforms like AWS. If a major cloud provider were to suspend or restrict access to Solana nodes, a substantial number of validators could be affected, potentially leading to temporary network instability or increased centralization risks. Additionally, high operational costs (~$800-$1,200 per month) may discourage broader participation, especially if SOL's price declines, potentially reducing the number of independent validators securing the network.

Dependency on Key Infrastructure Components

Beyond validators, Solana also relies on Remote Procedure Call (RPC) nodes to serve as intermediaries between users and the blockchain. If major RPC providers experience downtime or are compromised, users may be unable to submit transactions or retrieve blockchain data, even if the network remains operational. Additionally, services like Solana Beach, Solscan, and block explorers play a role in network visibility—if these tools provide incorrect data or go offline, it could create confusion among users, even though it would not affect the blockchain itself. To address these concerns, Solana is working to decentralize RPC services and encourage community-operated nodes.

Transaction Spam, Network Congestion, and Denial-of-Service (DoS) Risks

Solana's high throughput does not make it immune to transaction spam. In previous cases, bots flooding the network during NFT mints or DeFi events have led to congestion, causing delayed transactions and degraded user experience. While the network remained functional, congestion significantly impacted usability. To counter this, Solana has implemented stake-weighted quality-of-service (QoS) mechanisms and prioritization fees, giving preference to transactions from staked accounts. However, adversaries may develop new spam strategies, such as exploiting computationally expensive smart contracts to slow down validators. Since network resilience against

DoS attacks is an ongoing challenge, Solana may need further optimizations, dynamic fee markets, or additional congestion controls.

Censorship Resistance vs. Regulatory Compliance

As a decentralized blockchain, Solana aims to be censorship-resistant, but external pressures on large validators or staking providers could introduce risks. Similar to how some Ethereum validators began filtering Tornado Cash transactions after regulatory sanctions, large institutional validators or staking pools on Solana could, under certain circumstances, be pressured to exclude transactions from sanctioned addresses. If a significant portion of the network engaged in censorship, it could lead to fragmentation of network participation, delays in transaction confirmations, or governance discussions about countermeasures such as slashing penalties for censoring validators.

Smart Contract Risks in Core Programs

Solana's on-chain system programs, such as the System Program (account creation), Stake Program, and Token Program, are fundamental to blockchain operations. While these programs are designed with higher security standards than typical DeFi smart contracts, they are still susceptible to potential bugs. A vulnerability in a core system program—such as an exploit allowing unauthorized unstaking of SOL—could lead to significant financial losses or network disruptions. These programs undergo audits and strict security reviews, but the possibility of future vulnerabilities remains a risk.

Interoperability and Cross-Chain Risks

Solana does not natively support cross-chain interactions and relies on bridging protocols to connect with other blockchains. Historically, bridges have been a major attack vector in the crypto space, with past incidents resulting in significant losses due to hacks or exploited vulnerabilities. If a cross-chain bridge used by Solana were to be compromised, assets bridged to Solana could lose backing, affecting dApps and liquidity pools that rely on them. Future interoperability solutions, such as direct integrations with Cosmos IBC or Ethereum bridges, could introduce additional technical and security challenges that need careful management.

I.6 Mitigation Measures

Solana has implemented several technical, security, and governance measures to address network stability, decentralization, security risks, and regulatory uncertainties. These efforts aim to enhance resilience, improve validator distribution, and ensure long-term adaptability.

Network Upgrades and Stability Improvements

Following previous network outages and congestion events, Solana's core developers have introduced multiple enhancements to increase network reliability and scalability. Transaction fee prioritization has been implemented to ensure that spam transactions must pay significantly higher fees to outbid legitimate transactions, discouraging excessive network congestion. The adoption of the QUIC protocol for network communication has improved flow control and resilience against packet flooding, replacing the previous reliance on pure UDP. Additionally, optimizations in the execution runtime have strengthened the network's ability to handle transaction surges during periods of high demand. These upgrades collectively improve network stability and responsiveness, reducing the likelihood of service disruptions.

Validator Decentralization Initiatives

To mitigate stake centralization risks, the Solana Foundation actively supports decentralization through a delegation program that allocates SOL stake to smaller, high-quality independent validators. This initiative ensures that staking rewards are more evenly distributed, preventing excessive concentration of network control among a few large validators. The Foundation also monitors validator distribution across geographic locations and data centers, publishing reports to encourage greater diversity. If an excessive number of validators are found operating within a single data center or cloud provider, the community is alerted, promoting infrastructure diversification and reducing dependency on centralized hosting services.

Security Audits and Bug Bounties

Solana's core infrastructure and smart contract ecosystem undergo continuous security assessments. The Solana Foundation engages independent third-party auditors, such as Kudelski Security, Sec3, and Ottersec, to conduct security reviews of the blockchain's core components, including critical programs like the Token Program and Stake Program. Additionally, bug bounty programs incentivize external security researchers to identify and report vulnerabilities, strengthening proactive threat mitigation. These efforts ensure that potential exploits or weaknesses are identified and addressed before they can impact network operations.

Quantum Resistance Planning

Although quantum computing risks are not an immediate threat, Solana's development community remains aware of potential long-term challenges. Future mitigation strategies may involve transitioning to post-quantum cryptographic signature schemes such as Falcon or Dilithium, which are being explored as part of industry-wide efforts to enhance cryptographic resilience. While no immediate changes have been announced, the Solana ecosystem is expected to coordinate with other blockchain projects to implement quantum-resistant security upgrades when necessary.

Regulatory Engagement and Compliance Strategies

The Solana Foundation has been proactive in engaging with regulators and policymakers to clarify SOL's regulatory classification and ensure compliance with evolving legal frameworks. In response to regulatory scrutiny, the Foundation has publicly opposed the SEC's classification of SOL as a security and remains open to legal engagement on the matter. Within the EU, Solana aligns with MiCA (Markets in Crypto-Assets Regulation), which provides a clear legal framework for SOL's trading and disclosure requirements, helping reduce uncertainty for investors and institutions.

Furthermore, Solana's validator network and ecosystem participants are globally distributed, reducing reliance on any single jurisdiction. This geographical diversification acts as a risk mitigation measure, ensuring that if certain regions impose restrictions on SOL trading or staking, the network remains operational in other jurisdictions. While localized regulatory actions could affect market conditions in restricted areas, Solana's global nature helps preserve network functionality and accessibility.

J. PART J - INFORMATION ON THE SUSTAINABILITY INDICATORS IN RELATION TO ADVERSE IMPACT ON THE CLIMATE AND OTHER ENVIRONMENT-RELATED ADVERSE IMPACTS

Adverse impacts on climate and other environment-related adverse impacts.

J.1 Mandatory information on principal adverse impacts on the climate and other environment-related adverse impacts of the consensus mechanism

Solana's hybrid PoH-PoS consensus model eliminates the need for energy-intensive mining while maintaining high-speed, low-cost transactions. This design enables efficient processing with minimal computational overhead, making Solana significantly more energy-efficient than Proof-of-Work (PoW) blockchains.

The network's annual energy consumption is 5,365,500 kWh, with 14.77% sourced from renewable energy. Scope 1 emissions are zero, while Scope 2 emissions total 1,873.143 tCO_2e per year. The energy and GHG intensity per transaction are effectively 0.00000 kWh and 0.00000 $kgCO_2e$, respectively.

Solana's efficiency is further supported by optimized validator operations, leveraging GPU acceleration and hardware optimizations. Upgrades like QUIC protocol adoption improve network flow control and congestion management, reducing unnecessary power usage. As validator infrastructure evolves, increasing renewable energy adoption is expected to further enhance Solana's sustainability profile.

General information	
S.1 Name *Name reported in field A.1*	LCX
S.2 Relevant legal entity identifier Identifier referred to in field A.2	529900SN07Z6RTX8R418
S.3 Name of the crypto-asset Name of the crypto-asset, as reported in field D.2	Solana
S.4 Consensus Mechanism The consensus mechanism, as reported in field H.4	Solana's consensus mechanism is a Byzantine Fault Tolerant (BFT) Proof-of-Stake (PoS) system enhanced by Proof-of-History (PoH). Validators participate in weighted voting based on stake, with PoH acting as a global time source to streamline consensus. Leader Selection The leader schedule is deterministic, precomputed for each epoch (~2 days) based on stake weight. Each slot (~400ms) has a designated leader responsible for producing a block. If a leader fails to produce a block, the next scheduled leader proceeds after the slot duration, ensuring the network continues

	operating (although the missed slot remains empty). Voting & Finality Validators verify transactions and submit vote transactions referencing the latest confirmed block. Tower BFT enforces a lockout mechanism, meaning each vote also implicitly confirms all previous blocks and extends the lockout period for those blocks. If a validator votes on a competing fork, it breaks the lock and risks penalties (though slashing is not actively enforced yet). A block is finalized once it accumulates enough stake-weighted votes, making it economically unfeasible to revert unless more than 1/3 of validators act maliciously. The network designates a rooted block—the oldest block with 2/3+ supermajority confirmation—as the new ledger root, ensuring finality for all prior blocks. Integration of Proof-of-History (PoH) PoH serves as a cryptographic timestamping mechanism, allowing validators to verify the order of events without requiring additional rounds of communication. The leader includes the current PoH hash in each block, ensuring that validators can determine the correct sequence of blocks relative to others. This process significantly reduces latency and increases throughput, as validators do not need to synchronize timestamps through conventional consensus rounds.
S.5 Incentive Mechanisms and Applicable Fees Incentive mechanisms to secure transactions and any fees applicable, as reported in field H.5	Solana's economic model is structured to incentivize network security, staking participation, and efficient transaction processing while maintaining low fees for users. Validators, responsible for producing blocks and securing the network, earn staking rewards through an inflationary issuance of SOL tokens. As of 2025, the annualized inflation rate is approximately 4.68% and is set to decrease yearly, following a predefined monetary policy. Validators receive rewards in proportion to the amount of SOL staked with them, which includes both their own stake and delegated tokens from other users. To compensate for their services, validators can set a commission fee, typically ranging between 5-10%, which is deducted from the rewards distributed to

	delegators. This mechanism ensures that validators remain incentivized to provide reliable uptime and performance, as missed votes lead to lower rewards. At the same time, token holders are encouraged to stake their SOL rather than hold it idle, as staking provides additional rewards while contributing to the network's security. Solana's transaction fee model is designed to be cost-effective, making the network suitable for high-frequency use cases such as payments, gaming, and decentralized applications. The fees for a basic transaction are typically a fraction of a cent, around 0.000005 SOL. Every transaction includes a fee that is deducted from the sender's account. Half of the collected transaction fees are burned, permanently reducing the total SOL supply, while the other half is allocated to the validator that processes the transaction. This system introduces a deflationary element, offsetting inflation over time, especially as network activity increases. While current fee burning represents only a minor reduction in the overall supply, higher transaction volumes in the future could lead to greater deflationary effects, potentially balancing or even surpassing new token issuance. Validators on Solana are currently subject to minimal penalties. Unlike some Proof-of-Stake blockchains that enforce slashing for downtime or incorrect behavior, Solana's current model does not slash validators who are offline, although they simply do not earn rewards while inactive. Slashing for double-signing exists as a deterrent but has not been actively enforced as of 2025. Future governance proposals may introduce stricter penalties, particularly for prolonged validator inactivity, to further ensure the reliability of the network. Solana also implements a mechanism related to account storage, which previously involved an ongoing rent fee for maintaining an account on-chain. This has since been replaced with a requirement for accounts to maintain a minimum SOL balance to remain active. If an account balance falls below this rent-exempt threshold, its funds may be reclaimed and burned, adding another deflationary aspect to Solana's tokenomics. Most wallet applications handle this process automatically by ensuring that new accounts are funded with the required minimum SOL, making the mechanism seamless for users. The broader economic alignment of Solana ensures that validators, token holders, and

	network participants share common incentives. Validators benefit from higher transaction volumes as they collect fees, while SOL holders gain from a secure and efficient network that supports a wide range of applications. As of early 2025, over 70% of SOL's circulating supply is staked, strengthening economic security and reducing token liquidity, which can help stabilize price fluctuations. The combination of decreasing inflation, fee burning, and high staking participation leads to a monetary policy that ensures sustainable token issuance. If transaction volumes continue to rise significantly, fee burning could play a larger role in offsetting new issuance, potentially bringing net inflation close to zero or even negative in certain periods of high network activity.
S.6 Beginning of the period to which the disclosure relates	2024-03-06
S.7 End of the period to which the disclosure relates	2025-03-06
Mandatory key indicator on energy consumption	
S.8 Energy consumption Total amount of energy used for the validation of transactions and the maintenance of the integrity of the distributed ledger of transactions, expressed per calendar year	5365500.00000 kWh per year
Sources and methodologies	
S.9 Energy consumption sources and Methodologies Sources and methodologies used in relation to the information reported in field S.8	For the calculation of energy consumptions, the so called "bottom-up" approach is being used. The nodes are considered to be the central factor for the energy consumption of the network. These assumptions are made on the basis of empirical findings through the use of public information sites, open-source crawlers and crawlers developed in-house. The main determinants for estimating the hardware used within the network are the requirements for operating the client software. The energy consumption of the hardware devices was measured in certified test laboratories. When calculating the energy consumption, we used - if available - the Functionally Fungible Group Digital Token Identifier (FFG DTI) to determine all implementations of the asset of question in scope and we update the mappings regulary, based on data of the Digital Token Identifier Foundation.

J.2 Supplementary information on principal adverse impacts on the climate and other environment-related adverse impacts of the consensus mechanism

Supplementary key indicators on energy and GHG emissions	
S.10 Renewable energy consumption Share of energy used generated from renewable sources, expressed as a percentage of the total amount of energy used per calendar year, for the validation of transactions and the maintenance of the integrity of the distributed ledger of transactions.	14.770208242%
S.11 Energy intensity Average amount of energy used per validated transaction	0.00000 kWh
S.12 Scope 1 DLT GHG emissions – Controlled Scope 1 GHG emissions per calendar year for the validation of transactions and the maintenance of the integrity of the distributed ledger of transactions	0.00 tCO2e per year
S.13 Scope 2 DLT GHG emissions – Purchased Scope 2 GHG emissions, expressed in tCO2e per calendar year for the validation of transactions and the maintenance of the integrity of the distributed ledger of transactions	1873.14310 tCO2e/a
S.14 GHG intensity Average GHG emissions (scope 1 and scope 2) per validated transaction	0.00000 kgCO2e per transaction
Sources and methodologies	
S.15 Key energy sources and methodologies Sources and methodologies used in relation to the information reported in fields S.10 and S.11	To determine the proportion of renewable energy usage, the locations of the nodes are to be determined using public information sites, open-source crawlers and crawlers developed in-house. If no information is available on the geographic distribution of the nodes, reference networks are used which are comparable in terms of their incentivization structure and consensus mechanism. This geo-information is merged with public information from the European Environment Agency (EEA) and thus determined.
S.16 Key GHG sources and methodologies Sources and methodologies used in relation to the information reported in fields S.12, S.13 and S.14	To determine the GHG Emissions, the locations of the nodes are to be determined using public information sites, open-source crawlers and crawlers developed in-house. If no information is available on the geographic distribution of the nodes, reference networks are used which are comparable in terms of their incentivization structure and consensus mechanism. This geo-information is merged with public

	information from the European Environment Agency (EEA) and thus determined.