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

N	Field	Content
General Information		
S.1	**Name**	Zillion Bits Ltd
S.2	**Relevant legal entity identifier**	254900FESD7AF56FOQ37
S.3	**Name of the crypto-asset**	Solana (SOL)
S.4	**Consensus mechanism**	Solana employs a hybrid consensus mechanism combining Proof of History (PoH) with Proof of Stake (PoS). Proof of History is a sequence of computations that provides a digital record of the passage of time between events, acting as a cryptographic clock that enables the network to agree on time and sequence without relying on traditional timestamps. This innovation allows Solana to achieve high throughput by establishing a reliable time source for the network, reducing communication overhead between nodes when validating transactions. The Proof of Stake component of Solana's consensus mechanism requires validators to stake SOL tokens as collateral to participate in transaction validation and block production. Validators are selected to produce blocks based on their proportional stake in the network, with those holding larger stakes having a higher probability of being chosen. This economic model incentivises validators to act honestly, as they risk losing their staked tokens if they attempt to validate fraudulent transactions. Unlike Proof of Work systems that require energy-intensive mining, Solana's PoH+PoS approach significantly reduces energy consumption while maintaining decentralisation and security. The network uses a leader rotation system where validators take turns producing blocks, with the schedule determined by the PoH sequence and weighted by stake.
S.5	**Incentive mechanisms and applicable fees**	Solana's consensus mechanism employs a sophisticated incentive structure to secure transactions and maintain network integrity. Validators earn rewards through a

		combination of inflation-based staking rewards and transaction fees, creating economic motivation for honest participation. The network distributes part of its total supply annually as inflation rewards, which gradually decreases over time according to a predetermined disinflationary schedule. These rewards are allocated proportionally based on stake weight, with validators typically sharing a portion of their earnings with delegators who contribute to their stake pool. Transaction fees on Solana follow a market-based pricing model where users bid for block space through a fee priority mechanism. Unlike many blockchains, Solana does not burn transaction fees but instead redirects them to validators as additional compensation. This fee structure incentivises validators to process transactions efficiently while maintaining network security. The network employs several technical mechanisms to reinforce these economic incentives, including leader rotation based on stake weight, slashing penalties for malicious behaviour, and vote credits that reward consistent participation. Validators must maintain high uptime and performance standards to maximise rewards, as missed vote opportunities result in reduced earnings. This creates a self-reinforcing system where validators are financially motivated to invest in reliable infrastructure and honest operation, directly contributing to Solana's high throughput and low latency.
S.6	**Beginning of the period to which the disclosure relates**	2024-01-01
S.7	**End of the period to which the disclosure relates**	2024-12-31
	Mandatory key indicator on energy consumption	
S.8	**Energy consumption (kWh/year)**	6767856.00000
	Sources and methodologies	
S.9	**Energy consumption sources and methodologies**	The methodology calculates the SOL environmental sustainability indicators in compliance with EU Commission Delegated Regulation (EU) 2025/422. The calculation determines total network consumption, representing the energy required for transaction validation and distributed ledger maintenance. The calculation involves analysing Solana's validator network, mapping node locations to regional electricity grids,

		determining power requirements under different loads, and applying appropriate emission factors. Data is collected through validator registry analysis, hardware profiling, transaction data extraction from the Solana Explorer, and regional energy grid assessment. The methodology follows a structured implementation timeline and addresses data quality through hierarchical estimation procedures when direct measurements are unavailable, cross-verification against multiple sources, and uncertainty assessment. The methodology makes several key assumptions that influence the results, including uniform power consumption across all validators regardless of hardware variations, 24/7 continuous operation of all validators, a modelled regional distribution of validators, and standard server weight and lifecycle. These assumptions allow for a consistent calculation approach while acknowledging inherent uncertainties in the assessment (estimated uncertainty ranges of ±15%).

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	
N	**Field**	**Content**
S.10	**Renewable energy consumption (percentage of the total amount of energy used per calendar year)**	24.60000
S.11	**Energy intensity (energy used per validated transaction in kWh)**	0.02140
S.12	**Scope 1 DLT GHG emissions – Controlled (in t CO2eq per year)**	0.00000
S.13	**Scope 2 DLT GHG emissions – Purchased (in t CO2eq per year)**	2540.00000
S.14	**GHG intensity (emissions per validated transaction in kg CO2eq)**	0.00805

	Sources and methodologies	
S.15	**Key energy sources and methodologies**	The methodology calculates the SOL environmental sustainability indicators in compliance with EU Commission Delegated Regulation (EU) 2025/422. This methodology employs a modelled geographic mapping approach that analyses the regional distribution of Solana validators and applies corresponding regional renewable energy percentages from the International Energy Agency's grid data. This calculation yields a network-wide renewable energy share, representing the portion of Solana's energy consumption derived from renewable sources. The methodology calculates energy intensity by dividing the total network energy consumption by the total number of transactions processed during the reporting period. Key assumptions include the regional distribution of validators based on Solana Foundation data, the applicability of national/regional renewable energy percentages to validator locations, and the attribution of all energy consumption to transaction processing and network maintenance. Data sources include the Solana Explorer for transaction counts, the IEA for grid emission factors, and the validator registry analysis for geographic distribution. The methodology addresses data limitations through a hierarchical approach to estimation, using the most reliable data sources available and applying conservative assumptions when direct measurements are unavailable. It includes validation against published benchmarks and acknowledges an uncertainty range of ±15%.
S.16	**Key GHG sources and methodologies**	The methodology calculates the SOL environmental sustainability indicators in compliance with EU Commission Delegated Regulation (EU) 2025/422. This methodology calculates the greenhouse gas emissions associated with SOL. It employs a location-based approach to determine Scope 2 emissions by multiplying regional energy consumption by corresponding grid emission factors from the International Energy Agency (IEA) and regional electricity authorities. The calculation maps validator energy use across regions and applies region-specific emission factors to determine the total network emissions. The methodology calculates GHG intensity by dividing total emissions by the number of transactions processed. Scope 1 emissions are considered negligible due to the nature of the equipment operated by validators. The approach assumes that validators in each region experience the average grid

		carbon intensity of that region, that the regional distribution data from the Solana Foundation is representative, and that emissions factors from the IEA accurately reflect the actual carbon intensity of electricity consumed by validators. The methodology addresses data quality through cross-verification with multiple sources and acknowledges an uncertainty range of ±20% for GHG emissions due to variability in regional grid factors and potential inaccuracies in validator location data.