

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	Ripple (XRP)
S.4	Consensus Mechanism	<p>The XRP token operates on the Ripple Protocol Consensus Algorithm (RPCA), a consensus mechanism designed to enable distributed transaction validation without mining. Unlike the energy-intensive Proof of Work systems, RPCA uses a validator-based approach, where validator nodes independently exchange and evaluate proposed sets of transactions.</p> <p>Each validator proposes candidate transactions during an initial deliberation phase, collecting and considering proposals from other trusted validators. Subsequently, during validation, validators decide whether to accept a ledger based on validations received from nodes within their Unique Node List (UNL). A ledger achieves consensus when a supermajority of validators in a node's UNL validate the same ledger version.</p> <p>Overall, this consensus method enables XRP Ledger to achieve high transaction throughput and low latency, typically settling transactions within 3–5 seconds, while significantly reducing the energy consumption characteristic of mining-based blockchain systems.</p>
S.5	Incentive Mechanisms and Applicable Fees	<p>The XRP Ledger Consensus Protocol does not depend on direct economic rewards, such as mining rewards or staking returns, to secure the network. Instead, it leverages a trust-based system where validators participate due to intrinsic motivations such as maintaining network reliability, security, and efficiency, which align with their own operational interests.</p> <p>XRP employs a fixed, minimal transaction cost (typically a fraction of a cent), which serves mainly as a spam-prevention measure rather than a source of revenue or validator reward. Importantly, these transaction fees are not redistributed to validators but are permanently removed from circulation (burned). This structure ensures predictable, low transaction costs and avoids fluctuating fee markets common in other blockchain systems.</p>

		This validator-centric approach, free of direct economic incentives such as token rewards or mining, allows the XRP Ledger to maintain robust consensus security while significantly reducing the energy consumption.
S.6	Beginning of the period to which the disclosure relates	2024-04-01
S.7	End of the period to which the disclosure relates	2025-03-31
Mandatory key indicator on energy consumption		
S.8	Energy consumption (kWh/year)	301740.00000
Sources and methodologies		
S.9	Energy consumption sources and Methodologies	<p>The total energy consumption for the XRP token calculation represents the total electricity consumed by all validators participating in the XRP Ledger Consensus Protocol required for transaction validation and maintenance of the XRP Ledger.</p> <p>Data Sources:</p> <ul style="list-style-type: none"> ▪ XRP Ledger validator registry to determine active validator count; ▪ Technical specifications of server hardware typically used for XRP validation; ▪ Academic literature on the energy efficiency of consensus mechanisms; and ▪ Industry benchmarks for comparable validator node operations. <p>Key Assumptions:</p> <ul style="list-style-type: none"> ▪ Validator node count remained relatively stable throughout the reporting period; ▪ Average power consumption represents the typical server hardware used by validators; ▪ All validators operate continuously (24 hours/day, 365 days/year); and ▪ Energy consumption primarily relates to computing, storage, networking, and cooling requirements. <p>Limitations:</p> <ul style="list-style-type: none"> ▪ Direct measurement of each validator's energy consumption was not practical due to the distributed nature of the network. Power consumption values were derived from server hardware specifications and typical operational conditions.