KLAYR WHITEPAPER

Introduction and Purpose

This whitepaper has been prepared in accordance with the European Union's Markets in Crypto-Assets (MiCA) regulation, providing full transparency on the Klayr project, the offered crypto-assets, and the associated risks and responsibilities.

The purpose of this document is to equip investors and stakeholders with detailed information about the structure, technology, and sustainability of the Klayr ecosystem.

Key Information and Responsibilities

ISSUER AND OFFEROR

- **Name and legal form of the issuer**: Klayr Labs B.V.
- **Address and country of establishment**: Europalaan 101, 3526 KR, Utrecht
- **Registration number**: 93299974

Trading Platform Operator

The crypto-asset information is provided by Klayr Labs and is intended for use within the Klayr ecosystem. Klayr Labs reserves the right to adjust platform characteristics to comply with regulatory standards and project development needs.

Version 1.0, published on 20 December 2024

Regulatory Disclaimer and Risk Acknowledgement

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.

Disclaimer of Risks and Limitations

The Klayr crypto-asset involves significant risks, and prospective users and investors should consider the following:

a) The Klayr crypto-asset may partially or entirely lose its value;
b) The Klayr crypto-asset may not always be transferable, depending on technical and market conditions;
c) The Klayr crypto-asset may lack liquidity, which could restrict the ability to sell or trade;
d) If the Klayr offering includes a utility token for public use, there is no guarantee that the utility token will be fungible with the good or service described in this whitepaper, particularly in the event of failure or discontinuation of the Klayr project;
e) The Klayr crypto-asset is not protected by investor compensation schemes as per Directive 97/9/EC of the European Parliament and of the Council;
f) The Klayr crypto-asset is not covered by deposit guarantee schemes under Directive 2014/49/EU.

Investors are advised to carefully evaluate these risks and consider seeking professional advice before participating in the Klayr ecosystem.

Statement of Compliance

The management body of Klayr Labs, as the issuer of this crypto-asset, hereby confirms that this whitepaper complies with the requirements set forth in this title. To the best of the management body's knowledge, the information provided in this whitepaper is accurate, clear, and not misleading, and no information has been omitted that could affect its significance.

Abstract

The Klayr Whitepaper outlines the foundational elements of the Klayr blockchain project, a next-generation Layer 1 platform designed to empower developers and users in the Web3 ecosystem. Compliant with the European Union's MiCA regulations, this document provides transparency on the project's structure, financial framework, and key milestones. Klayr leverages an energy-efficient Proof of Stake (PoS) consensus mechanism, prioritizing scalability, security, and interoperability.

Important Disclaimer

- This summary must be read as an introduction to the full crypto-asset whitepaper.
- Prospective holders should base their decision to purchase the crypto-asset on the content of the entire whitepaper, not solely on this summary.
- The public offering of the crypto-asset is not an offer or solicitation to purchase financial instruments. Such an offer or solicitation can only be made through a prospectus or other offering documents in accordance with applicable national laws.
- This crypto-asset whitepaper is not a prospectus within the meaning of Regulation (EU) 2017/1129 of the European Parliament and Council, nor is it another type of offering document under Union or national law.

What is Klayr?

Klayr is a modular and developer-friendly blockchain platform that offers tools for creating customized decentralized applications (dApps) and sidechains. Designed with accessibility in mind, Klayr leverages JavaScript to lower barriers for developers while focusing on interoperability within its ecosystem. Its core mission is to make blockchain technology scalable, user-centric, and sustainable, enabling a seamless Web3 experience for individuals and enterprises alike.

The KLY Token

The $KLY token is the native utility token of the Klayr ecosystem, supporting staking, transaction fees, and governance functionalities. With a total supply of 183 million tokens, $KLY is strategically allocated to incentivize community engagement, liquidity provision, and ecosystem growth. Currently, $KLY is available for trading on cryptocurrency exchanges, including CoinEx, Probit, and Bitrue, making it accessible to a global audience.

Since its inception in March 2024, Klayr Labs has secured stable funding through a partnership with the Onchain Foundation, ensuring operational continuity in 2024. The project maintains a robust treasury of $KLY tokens, allocated to growth, ecosystem development, and community engagement. Milestones include the launch of the blockchain in June 2024, the initiation of the Ambassador and Grant programs, and future enhancements such as Metamask Snaps integration and an EVM bridge.

The whitepaper also addresses key risks, including market volatility, liquidity challenges, and technological vulnerabilities, while outlining measures to ensure sustainability and compliance.

Klayr’s focus on accessibility, developer-centric tools, and long-term innovation positions it as a cornerstone for advancing blockchain adoption.

TABLE OF CONTENTS

A. Information about the offeror

A1. Name

Klayr Labs B.V.

A2. Legal form

Private Limited Company (Besloten Vennootschap)

A3. Registered address

Europalaan 101, 3526 KR, Utrecht, the Netherlands

A4. Registration date

19-03-2024

A5. Legal entity identifier

93299974

A6. Contact information

- Email address: HQ@klayr.xyz
- Website: klayr.xyz
- Response time: 5 business days

A7. Parent company

Klayr Holding B.V.

A8. Members of the Management Body

Name	Business address	Function
L. Bronsvoort	Europalaan 101, 3526 KR, Utrecht, the Netherlands	CEO
R. Cornelis	Europalaan 101, 3526 KR, Utrecht, the Netherlands	CPO
S. Mandemaker	Europalaan 101, 3526 KR, Utrecht, the Netherlands	CTO
J. Machielsen	Europalaan 101, 3526 KR, Utrecht, the Netherlands	CCO

A9. Business activity

Klayr Labs B.V. is a Dutch startup specializing in blockchain technology. The company focuses on developing a Layer 1 blockchain application platform that provides tools for digital ownership, enabling the new generation to build better solutions. In May 2024, Klayr Labs took over the Layer 1 technology of the Lisk blockchain, aiming to continue its development and make blockchain applications more user-centric. The team consists of experienced web3 entrepreneurs and tech developers. Klayr Labs is committed to advancing blockchain technology and making it more accessible to developers and users.

A10. Business activity parent company

Klayr Holding B.V. is the parent company of Klayr Labs B.V., a Dutch startup specializing in blockchain technology. As a holding company, Klayr Holding B.V. owns the shares of Klayr Labs B.V. and oversees its operations. This structure allows for effective management and strategic direction of the subsidiary's activities.

A11. Financial condition since registration

Klayr Labs B.V. was founded in March 2024 and operates under a robust financial framework supported by a one-year grant agreement with the Onchain Foundation and a solid token treasury to become sustainable in 2025. This chapter provides a detailed review of the financial condition and key developments of Klayr Labs since its establishment, including funding sources, financial performance, and capital resource utilization.

Funding Structure

Klayr Labs' primary funding source is a grant agreement with the Onchain Foundation for 2024. This agreement runs from January 2024 until December 2024 and has provided key financial resources to create and maintain operational stability during this critical startup phase. The funding was used to support the following key areas:

- Market-making activities to ensure liquidity and price stability for the Klayr token ($KLY).
- Team expenses, funding a team of 11 full-time equivalents (FTEs), including salaries, benefits, and training.
- Working environment, ensuring an efficient and collaborative workspace for the team.
- Community support, including resources to assist and engage the Klayr ecosystem's developer and user communities.
- Marketing activities, promoting Klayr and its Layer 1 (L1) technology to a global audience.

Token treasury

In addition to the grant funding, Klayr Labs maintains a treasury of approximately 30 million $KLY tokens. These tokens are allocated strategically to:

- Support project development and ecosystem growth.

- Fund partnerships and incentivize community contributions.
- Provide liquidity for exchange listings and other market activities.

A detailed breakdown of the token allocation is provided in Chapter D5: Resource Allocation.

Financial Performance and Key Indicators

As Klayr Labs has been operational for less than a year, no historical financial statements are yet available. However, a balanced review of the interim financial condition since registration indicates:

- Stable and predictable funding flows through the Onchain Foundation grant in 2024.
- Effective allocation of resources to ensure operational goals are met, including supporting the team and advancing the marketing strategy.
- Initial marketing and ecosystem development have demonstrated promising traction, including the launch of the Ambassador Program and initial exchange listings.

Key Performance Indicators (KPIs) tracked during this period include

- Liquidity: $KLY market liquidity levels have steadily increased through effective market-making activities.
- Ecosystem Engagement: Growth in the number of active community members, projects, and partnerships.
- Operational Efficiency: All planned activities have been executed within the allocated funding framework.

Future Financial Planning

Klayr Labs is exploring potential additional funding opportunities to further scale the ecosystem. Key initiatives include:

- Engaging Venture Capital (VC) Partners: attracting venture capital investment through equity and token deals.
- Treasury Token Utilization: Strategic use of our 30 million $KLY token treasury will drive growth initiatives, support new projects, and incentivize ecosystem contributions.
- Expanding Revenue Streams: As the ecosystem matures, revenue could be generated through token utility, partnerships, and ecosystem grants from external organizations.

B. Information about the issuer, if different from the offeror

This section is not applicable to us, as the issuer and offeror of the KLY token are the same entity.

C. Information About the operator of the trading platform

This section is not applicable to us, as we are not the operator of the trading platform where the KLY token is listed.

D. Information about the crypto-asset project

D1. Project overview

Project name	Klayr
Crypto-assets name	Klayr
Ticker handler	KLY

D2. Project description

The Klayr project focuses on developing a next-generation Layer 1 blockchain platform designed to empower developers and users in the Web3 ecosystem. With a strong emphasis on digital ownership and user-centric blockchain applications, Klayr Labs leverages innovative Layer 1 technology to provide a secure, scalable, and accessible infrastructure. This enables developers to build decentralized applications (dApps) that promote transparency, autonomy, and seamless interaction within the decentralized web. By prioritizing usability and advanced functionality, Klayr Labs aims to drive adoption and innovation in the blockchain space.

D3. Utility Token Classification

KLY is classified as a **utility token**, designed to facilitate access to and enhance the security and functionality within the Klayr blockchain platform.

D4. Key Features

The KLY token is a core utility within the Klayr ecosystem, offering several essential features that contribute to the platform's security, efficiency, and user engagement. Key features include:

- Network Security and Validation: KLY token holders can participate in network validation through staking, directly supporting the security, integrity, and stability of the blockchain by validating transactions and securing consensus.
- Governance Participation: KLY holders will have governance rights in the near future, enabling them to contribute to important decisions regarding network upgrades and policy changes. This decentralized governance will ensure that the community has a say in the platform's evolution.
- Transaction Facilitation: The KLY token functions as a means of payment for transaction fees within the Klayr network, facilitating seamless and efficient transactions across the platform.
- Access to Platform Services: By holding and utilizing KLY tokens, users gain access to a range of services, tools, and features offered within the Klayr ecosystem, promoting further engagement and utility.

D5. Resource Allocation

With the addition of 30 million KLY tokens to the Klayr treasury, we are strategically allocating these resources to key areas that will drive the platform's growth, stability, and community engagement. This allocation plan ensures that each token contributes directly to the sustainability and success of the Klayr ecosystem. Here's how the additional tokens will be used:

- Growth and Market Expansion: A portion of the additional tokens will be dedicated to scaling our operations and entering new markets. This allocation will fund initiatives that enhance Klayr's presence and adoption, support business development, and enable us to pursue partnerships that bring long-term value to our ecosystem.
- Liquidity and Market Making: To ensure smoother trading experiences and reduce volatility, a significant portion of the tokens will support liquidity and market-making efforts on key exchanges. This approach is designed to maintain a stable market environment, benefiting users with more consistent pricing and deeper liquidity.
- Community and Developer Incentives: We are allocating tokens to fuel community engagement and incentivize developer participation. This includes rewards for bounties, grants for project contributions, and incentives for early adopters and active participants. By investing in our community and developers, we are laying the groundwork for a robust ecosystem that will grow alongside Klayr.
- Treasury and Operational Reserves: A portion of the additional tokens will be held in the treasury to cover ongoing operational costs and future-proof the platform. These reserves will support day-to-day activities, secure future developments, and ensure Klayr's operational stability over the long term.
- Team Incentives: To retain and motivate top talent, we are allocating tokens for team incentives. Recognizing our team's contributions with performance-based rewards aligns their success with Klayr's progress and supports our mission by attracting and retaining expertise.

D6. Past and future milestones

This section outlines the key milestones of the Klayr crypto-asset project, providing a timeline of significant past achievements and future developments.

Past Milestones

- January 2024: Partnership established with the Onchain Foundation to take over the Layer 1 (L1) technology from Lisk, forming the foundation for Klayr's blockchain infrastructure.
- March 2024: Official founding of Klayr Labs B.V., the legal entity behind the Klayr project.
- April 2024: Rebranding of key products to align with the Klayr vision and ecosystem.
- June 2024: Successful launch of the Klayr blockchain, marking the start of the project's mainnet operations.

- July 2024: Initial listings of the $KLY token on major cryptocurrency exchanges, increasing accessibility for investors and users.
- August 2024: Launch of the Grant Program and Ambassador Program to foster ecosystem development and community engagement.

Future Milestones

- December 2024: Beta releases of Explorer 2.0 and Klayr Gateway, providing enhanced tools for blockchain navigation and ecosystem integration.

Envisioned future developments

- Metamask Snaps integration, enabling seamless connectivity for users through one of the most popular wallets.
- Implementation of WebAssembly (WASM) for expanded development capabilities.
- Development and deployment of the EVM bridge, ensuring interoperability with Ethereum and other EVM-compatible blockchains.

E. Information about the Admission to Trading

E1. Admission to trading

Indication	‘ATTR’ - admission to trading

Since there was no initial public offering of the KLY token, this whitepaper pertains solely to the token’s admission to trading on exchanges, allowing holders to access and utilize the token within the Klayr ecosystem through open market participation.

E2. Reasons for Admission to Trading

The primary purpose of seeking admission to trading for the KLY token is to enhance accessibility and provide liquidity for users within the Klayr ecosystem. By listing KLY on exchanges, we facilitate community engagement, staking participation, and governance involvement, all of which are essential for the platform's active use and long-term sustainability. This trading access supports the growth and health of the ecosystem rather than serving as a means of fundraising.

E3. Targeted holders

Targeted holders	‘ALL’ – all types of investors

E4. Trading platforms

Trading platform name	Trading Platforms Market Identifier Code (MIC)	Trading Platforms Access
Bitrue	n/a	www.bitrue.com
Coinex	n/a	www.coinex.com
Probit	n/a	www.probit.com

F. Information about the crypto-assets

F1. Crypto-asset type

The KLY token is classified as a **utility token**, as it enables access to and supports core functions within the Klayr platform, including staking, governance participation, and payment of transaction fees.

F2. Crypto-asset functionality and application

The KLY token is a utility token that serves essential functions within the Klayr ecosystem. It allows holders to participate in network validation and governance through staking, contributing to the platform's security and stability. Additionally, the KLY token can be used to pay transaction fees within the network, supporting seamless interactions and transactions.

The KLY token includes the following characteristics and functionalities:

- Staking and Network Integrity: KLY token holders can participate in staking to validate transactions and secure the network. This functionality is already in effect and forms an integral part of the network infrastructure.
- Governance: In the future, holders will have the opportunity to participate in decision-making related to network policies and upgrades. This feature will be introduced in phases and activated once the governance mechanism is fully implemented.
- Means of Payment for Transaction Fees: The KLY token is used to pay transaction fees within the Klayr network. This functionality is available immediately, allowing users to efficiently conduct interactions within the platform.

These functionalities are currently available or are being phased in according to a strategic timeline to ensure a sustainable and engaged ecosystem.

G. Rights & obligations attached to the crypto-asset

G1. Purchaser rights and obligations

Purchasers of KLY tokens gain the right to utilize the Klayr platform's services, including participation in network staking and governance (if applicable). They are responsible for the security of their Klayr Wallets, including passwords, private keys, and passphrases. To exercise these rights, purchasers must use the Klayr platform in accordance with the Terms of Use. Should any issues arise regarding wallet security, purchasers are instructed to contact Klayr support at security@klayr.xyz.

G2. Conditions for modifications of rights and obligations

The rights and obligations associated with the use of Klayr and the KLY token may change over time. Klayr reserves the right to update these Terms of Use to reflect new features or regulatory requirements. Any changes will be posted on the Klayr website, with new terms taking effect 14 days after posting. Continued use of the platform implies acceptance of any modifications.

G3. Information on Future Offerings of Crypto-assets by the Issuer and the Number of Crypto-assets Retained by the Issuer

At present, there are no planned future public offerings of KLY tokens by the issuer. However, as part of the recent token supply increase, an additional 30 million KLY tokens were minted, bringing the total supply to 183 million tokens. These 30 million tokens have been strategically allocated by the issuer to support platform growth, enhance liquidity, fund market-making activities, and incentivize community participation. This allocation will be managed transparently to ensure that resources are available for the platform's long-term development, stability, and sustainability.

G4. Information on the quality and quantity of goods or services

The KLY token is a utility token within the Klayr ecosystem, granting holders access to essential network services that enhance security and functionality. Specifically, KLY tokens allow users to participate in network staking for added security, governance for platform decision-making, and transaction fee payments within the network. The underlying technology supporting these services has been developed over an 8-year period by Lisk and has undergone thorough audits, ensuring a high standard of quality and reliability. These services support the Klayr platform's integrity, stability, and usability, and are designed to scale in line with the platform's development.

G5. Information on how utility tokens can be exchanged for goods or services

KLY tokens can be exchanged directly within the Klayr network for platform services, including staking and transaction fees. Users wishing to participate in staking or governance must hold and allocate KLY tokens accordingly within the platform. Transaction fees are automatically deducted in KLY tokens during any transaction, facilitating seamless access to network functionality. These exchanges

are executed entirely within the Klayr ecosystem, ensuring an integrated and efficient experience for token holders.

G6. Restrictions on the Transferability

There are no restrictions on the transferability of KLY tokens. Once acquired, holders can freely transfer, trade, or use KLY tokens within the Klayr ecosystem or on supported exchanges, in accordance with applicable laws and regulations.

G7. Applicable Law and Competent Jurisdiction for the Crypto-assets

The KLY token and all related activities within the Klayr ecosystem are governed by the laws of The Netherlands. Any disputes or legal matters related to the KLY token will be subject to the jurisdiction of the courts in Utrecht, The Netherlands.

H. Information of the underlying technology

Klayr Labs leverages innovative Layer 1 technology to provide a secure, scalable, and accessible infrastructure. This enables developers to build decentralized applications (dApps) that promote transparency, autonomy, and seamless interaction within the decentralized web.

The Klayr SDK is a software development kit that allows for building separate interoperable blockchains. With a modular architecture it is possible to create use case specific blockchains. This also allows for a different consensus module and the creation of custom functionality through, community created, modules.

Klayr is a fork of the Lisk SDK. The Lisk SDK v6.1 has been adopted as the Klayr SDK. Read more details on the technology in the https://klayr.xyz/documentation/. Or retrieve all open source code and documentation from https://github.com/klayrHQ.

H1. Distributed ledger technology

Blockchain technology is a decentralized digital ledger that records transactions across a network of computers, ensuring transparency, security, and immutability. Each transaction is grouped into a block, linked to the previous one, forming a chain that is resistant to modification. This structure eliminates the need for intermediaries, allowing for direct, peer-to-peer interactions.

Klayr leverages blockchain technology to create a scalable and interoperable ecosystem. By utilizing sidechains connected to a central mainchain, Klayr enables the development of customized applications with enhanced performance and security. This approach facilitates seamless communication between different blockchains, promoting innovation and efficiency within the network.

H2. Consensus Mechanism

Klayr utilizes a robust and energy-efficient Proof-of-Stake (PoS) consensus mechanism to secure its blockchain network. Validators stake their KLY tokens to increase their validator weight, determining their likelihood of being selected to generate blocks. Each round comprises 53 consecutive blocks, with 51 active validators selected based on their stake weight and 2 additional standby validators chosen randomly for inclusivity. Validators are assigned slots in a random order per round and must produce blocks during their designated slots. The process ensures decentralization, scalability, and network security while incentivizing participation through staking rewards. Unproductive validators are automatically banned to maintain network efficiency, ensuring the platform remains resilient and reliable.

As of November 20, 2024, the Klayr blockchain network comprises 53 active validator nodes distributed globally, ensuring decentralization and resilience. These nodes operate on diverse

hardware configurations, ranging from high-performance servers to specialized devices optimized for blockchain operations. For a detailed overview of the active nodes and their distribution, visit the Klayr explorer; https://explorer.klayr.xyz/network.

H3. Incentive Mechanisms and Applicable Fees

Klayr's incentive mechanisms are designed to attract participation and ensure network sustainability. Validators are rewarded with block rewards and a share of these block rewards are rewarded to stakers, creating a financial incentive to secure and participate in the network. Transaction fees, proportional to the computational and storage resources consumed, are collected to maintain fair and predictable costs for users. These fees contribute to the network's overall sustainability while encouraging efficient use of resources. By aligning incentives with active participation, Klayr fosters a robust and engaged ecosystem.

H4. Audit outcome

In July 2023, Trail of Bits conducted a comprehensive security assessment of the Lisk SDK v6.1, now adopted as the Klayr SDK. The audit reviewed the SDK's codebase, interoperability features, and additional components, focusing on identifying vulnerabilities that could affect confidentiality, integrity, and availability. Over 30 engineer-weeks of effort were dedicated to manual and automated testing, revealing several key findings. The Trail of Bits report can be found here.

Key Audit Highlights

- Critical Issues Identified: Some vulnerabilities, such as issues with sparse Merkle tree cryptography and message replay risks, were deemed high severity. Problems with insufficient access controls and data validation were also found.
- Overall Maturity: The SDK's modular architecture was commended for its organization and clarity. However, areas such as schema validation, cryptographic handling, and end-to-end testing needed improvement.
- Fix Review: After the initial audit, all critical vulnerabilities identified were addressed by Lisk before Klayr took over the SDK. The fixes were confirmed in a follow-up review by Trail of Bits.

Relevance to Klayr

As the Klayr SDK, this framework now benefits from a secure and stable foundation. The vulnerabilities identified and remediated ensure robust operation, particularly for critical components like interoperability protocols. Klayr continues to build on this secure framework, adhering to best practices to maintain and further improve its reliability and security.

I. Information on risks

I1. Risks related to the admission to trading

The public listing of the KLY token on trading platforms involves several risks that potential investors and users should consider:

- Market Volatility: The KLY token, like other crypto-assets, is subject to significant price fluctuations due to market sentiment, regulatory developments, and macroeconomic factors. These fluctuations can impact the value of the token and result in substantial financial risk for holders.
- Liquidity Risk: There may be periods of low liquidity, which can make it difficult to buy or sell large quantities of KLY tokens without significantly impacting the market price. This could lead to potential losses, especially in volatile market conditions.
- Regulatory and Compliance Risks: Regulatory changes could impact the trading and use of KLY tokens, potentially restricting access in certain jurisdictions or imposing new compliance requirements. Such regulatory developments may affect the token's market value and legal standing.
- Security Risks: Despite security measures, there remains a risk of cyberattacks, technical vulnerabilities, or security breaches on exchanges or wallets where KLY tokens are held, which could result in a loss of assets.
- Reputational Risks: Negative publicity, whether due to operational failures, regulatory challenges, or market events, could affect the reputation and market perception of KLY, impacting its demand and market value.
- Counterparty Risks: Users are exposed to counterparty risks when trading KLY on exchanges, as these third-party platforms may face issues such as insolvency, fraud, or regulatory actions, potentially impacting users' access to their tokens.

These risks highlight the importance of cautious participation and thorough understanding for those engaging with KLY in the open market.

I2. Issuer-related risks

The Klayr project and its KLY token are subject to several risks related to the issuer, which could impact the viability, reputation, and stability of the token. These risks include regulatory compliance, operational integrity, financial stability, legal uncertainties, and dependency on key individuals.

- Regulatory Compliance Risks: Klayr must navigate a complex array of regulatory requirements across various jurisdictions. Non-compliance could lead to fines, sanctions, or restrictions on KLY token offerings, potentially impacting its market acceptance and overall viability.

- Operational Risks: The success of Klayr depends on the effectiveness of its internal processes, personnel, and technology. Any failures in operational integrity, such as technical disruptions or staffing challenges, could result in service interruptions, financial losses, or reputational harm.
- Financial Risks: Klayr faces financial risks, including liquidity, credit, and market volatility, which may affect its ability to sustain operations, meet obligations, or maintain the stability and value of the KLY token.
- Legal Risks: Uncertainties in legal frameworks, potential lawsuits, or adverse rulings may impact Klayr's operations. Legal challenges could influence the legality, usability, or market value of the KLY token, adding risks to its adoption and functionality.
- Fraud and Mismanagement Risks: There is a risk of fraud or mismanagement within Klayr that could affect the usability or value of the KLY token. Any such incidents could also damage the credibility and trustworthiness of the project.
- Reputational Risks: Klayr's reputation could be impacted by operational issues, security breaches, or associations with illicit activities. Negative publicity could erode user trust and reduce both the value and acceptance of the KLY token.
- Technology Management Risks: The Klayr platform requires ongoing updates and improvements to stay relevant and secure. Failure to keep up with technological advancements or inadequate management of updates could make the platform vulnerable to obsolescence or security threats.
- Dependency on Key Individuals: The Klayr project is partially dependent on the expertise and leadership of key individuals within the team. Any loss or transition of these individuals could disrupt operations, reduce user confidence, or potentially hinder project success.
- Conflicts of Interest: If the interests of Klayr's management diverge from those of KLY token holders, decisions may be made that are not fully aligned with token holders' best interests, potentially impacting the token's value and the credibility of the project.
- Counterparty Risks: Klayr's partnerships and collaborations are essential to its operations. However, there is a risk that partners, suppliers, or collaborators may not fulfill their obligations, which could impact Klayr's ability to deliver services or meet platform goals.

I3. Crypto-Assets-Related Risks

The Klayr project and its KLY token involve a variety of risks inherent to the crypto-asset market. These risks include factors such as market volatility, regulatory changes, liquidity challenges, and security vulnerabilities, each of which could impact the value, stability, and adoption of KLY within the Klayr ecosystem.

- Market Risk: The KLY token, like other crypto-assets, is subject to high volatility. Its value may fluctuate significantly due to market sentiment, regulatory developments, technological changes, and macroeconomic factors. These fluctuations could impact the token's perceived value and the stability of the Klayr ecosystem.

- Liquidity Risk: The KLY token may experience periods of low liquidity, making it challenging to buy or sell substantial amounts without affecting its market price. In fast-moving market conditions, this could lead to significant price impacts or potential losses for token holders.
- Custodial Risk: Holders of KLY tokens face custodial risks, including the possibility of wallet security breaches, loss of private keys, or failures of custodial services. These incidents could result in the irreversible loss of tokens. Users are responsible for securely managing their own Klayr Wallets and private keys.
- Regulatory and Tax Risk: Changes in the regulatory landscape around crypto-assets—including regulations related to consumer protection, taxation, and anti-money laundering—could affect the usage, value, or legality of KLY tokens in certain jurisdictions. Compliance with evolving regulations may require additional adjustments by Klayr.
- Counterparty Risk: If KLY tokens are held or traded on third-party exchanges or used in contractual agreements, there is a risk that counterparties may not fulfill their obligations. Factors such as insolvency, regulatory compliance issues, or fraud could result in a loss of KLY tokens.
- Reputational Risk: The reputation of KLY and the Klayr platform could be impacted by any association with illicit activities, high-profile security incidents, or technical failures. Such events could erode user trust and negatively affect the token's market value and adoption.

I4. Project implementation-related risks

The Klayr project faces several implementation-related risks that are inherent to developing and operating a blockchain platform. Key risks include:

- Technical Development Risks: As Klayr builds upon complex Layer 1 blockchain technology, there is a risk of unforeseen technical challenges that may arise during further development, upgrades, or scaling efforts. These challenges could potentially impact the timeline or quality of feature rollouts.
- Security Vulnerabilities: Despite extensive audits, there remains a risk of potential security vulnerabilities of cyberattacks that could target the Klayr network. Such vulnerabilities could disrupt network operations or compromise user assets.
- Regulatory Compliance Risks: As blockchain regulations evolve globally, there is a risk that new legal requirements could impact the operation or accessibility of the Klayr platform in certain jurisdictions. Adapting to regulatory changes may require additional resources and adjustments.
- Market Adoption and Competitive Risks: Adoption of the Klayr platform depends on market demand and user engagement. Additionally, competition from other blockchain platforms may impact Klayr's growth and market positioning, potentially influencing its long-term viability.
- Operational and Financial Risks: The successful implementation of the Klayr project requires continuous funding and operational support. Any constraints on resources or shifts in the

financial landscape could affect the project's ability to meet development milestones or operational targets.

These risks are actively managed by the Klayr team through careful planning, regular audits, and a responsive approach to regulatory changes. However, they remain a significant consideration in the project's overall implementation strategy.

I5. Technology-Related Risks and Mitigation Measures

The Klayr platform, built on a Layer 1 blockchain technology, involves certain risks inherent to blockchain systems. Below are key technology-related risks and the measures in place to mitigate them:

- Security Vulnerabilities: Blockchain networks can be vulnerable to cyberattacks, bugs, and other technical issues that may compromise the security of the Klayr network. To mitigate this risk, the Klayr technology, originally developed by Lisk, has undergone extensive security audits and is regularly monitored for vulnerabilities. Additionally, the platform implements best practices in encryption and secure coding standards.
- Scalability Challenges: As the Klayr network grows, there may be scalability challenges that could impact transaction speed and network efficiency. Klayr continuously evaluates and tests network upgrades to ensure that the platform can scale effectively and meet user demands, minimizing the risk of congestion and performance issues.
- Consensus Mechanism Risks: The Proof of Stake (PoS) consensus mechanism, while efficient, relies on a selected group of validators, which could potentially centralize power or lead to validator collusion. To address this risk, Klayr's governance model includes transparency and voting mechanisms to promote decentralization and community involvement in selecting validators.
- Dependency on Key Technology: The Klayr platform depends on the core technology's ongoing functionality and compatibility. Any disruptions or obsolescence of this underlying technology could impact the network's viability. Klayr mitigates this risk by ensuring compatibility with industry standards, regularly updating software, and remaining adaptable to future technological advancements.

These measures are designed to reduce technology-related risks and maintain a secure, efficient, and reliable environment for users within the Klayr ecosystem.

J. Information on the sustainability indicators in relation to adverse climate impact

J1. Mandatory information on principal adverse impacts on the climate and other environment-related adverse impacts of the consensus mechanism

Klayr Labs B.V. is providing information on principal adverse impacts on the climate and other environment-related adverse impacts of the consensus mechanism used to validate transactions in KLY and to maintain the integrity of the distributed ledger of transactions.

J2. Methodology for Energy Consumption Estimation

Consensus Mechanism (Proof of Stake)
Klayr employs a Proof of Stake (PoS) consensus model, which consumes significantly less energy than Proof of Work (PoW) systems due to reduced computational intensity. Under PoS, validators are selected based on staked collateral rather than computational power. This significantly lowers total energy usage. - *quick explanation of Proof of Stake* - energy consumption

Hardware Requirements and Energy Profiles
Minimum server requirements for Klayr are relatively modest (e.g., 8GB RAM).

Other parameters

Parameter	Klayr
Validators	51
Uptime	24/7

J3. Key Sustainability Metrics

The scenarios are based on the Cambridge Centre for Alternative Finance (CCAF) scenarios used for the calculations of the power usage of Ethereum. This broad range of computer specs are providing an insight into the potential energy usage of the Klayr network.
Energy per transaction is calculated by dividing total annual energy consumption by the number of validated transactions. The “TX Potential” number is based on several tests and provides the amount of energy per transaction when the network is heavily used.
GHG emissions resulting from validation are determined by assessing scope 1 (direct) and scope 2 (indirect energy) emissions. The final figure in tonnes of GHG emissions will be derived from energy consumption data and relevant emission factors. The emission factors are based on the Netherlands due to the fact that Klayr has its seat in the Netherlands.
It is an assumption that the majority of the servers are not always in the same country. The Klayr network provides IP data on the validator nodes here, so an actual estimation can always be made if necessary.

Scenarios	1	2	3	4	5	6
CPU	Broadcom BCM2711	Intel i3-8109U	Intel i5-8400T	Intel i5-1135G7	Intel i5-10400	AMD 3970X
Cores/Threads	4/4	2/4	6/6	4/8	6/12	32/64
Architecture	ARM	x86/x64	x86/x64	x86/x64	x86/x64	x86/x64
RAM	8 GB	8 GB	8 GB	16 GB	64 GB	256 GB
Storage	128 GB SSD	512 GB SSD	256 GB SSD	2 TB SSD	2 TB SSD	2 TB SSD
GPU	Onboard	Onboard	Onboard	Onboard	Onboard	AM 6970
PSU	USB-C	65 W	65 W	65 W	650 W	1,000 W
Case	Integrated	Integrated	Integrated	Integrated	Custom	Custom
OS	Ubuntu 20.04	Ubuntu 20.04	Ubuntu 20.04	Ubuntu 20.04	Ubuntu 21	Ubuntu 20.04
Mean (W)	**3,04**	**2,70**	**2,95**	**3,66**	**25,04**	**78,17**
Min (W)	2,92	2,60	2,57	3,55	24,53	77,52
Q1 (W)	3,00	2,64	2,87	3,65	24,75	77,85
Median (W)	3,05	2,69	2,94	3,66	24,87	78,04
Q3 (W)	3,06	2,70	3,00	3,66	25,15	78,34
Max (W)	3,96	17,78	17,33	4,37	26,64	118,14

Klayr Mainchain scenarios	1	2	3	4	5	6
kWh / yr *(scope 1 & 2)*	**3.721**	**3.305**	**3.611**	**4.480**	**30.649**	**95.680**
MWh / yr *(scope 1 & 2)*	3,7	3,3	3,6	4,5	30,6	95,7
kg CO2 / yr *(scope 1 & 2)*	**1.220**	**1.084**	**1.184**	**1.469**	**10.053**	**31.383**
Tonnes CO2 / yr *(scope 1 & 2)*	**1,22**	**1,08**	**1,18**	**1,47**	**10,05**	**31,38**
TX / kWh *(2024)*	0,27	0,24	0,26	0,33	2,24	7,01
TX / kWh *(yearly projection)*	8,79E-06	7,80E-06	8,53E-06	1,06E-05	7,24E-05	2,26E-04

Scope 1 = 4% of the total amount
Scope 2 = 96% of the total amount

Projection for the amount of transactions in 2024 is based on the actual transaction number (12.701) until December 18th 2024. The yearly estimate, 423.483.429, is based on a 60-minute test in December 2024.

All estimates assume continuous operation and do not account for potential virtualization, which is likely to occur in real world scenarios.

Scenarios are based on the Cambridge Blockchain Network Sustainability Index - source

Data Sources and Methodologies Used

Calculations may reference tools and frameworks from the Cambridge Centre for Alternative Finance (CCAF) and crypto-specific sustainability frameworks like the Crypto Carbon Ratings Institute, the Dutch environmental barometer and the Klayr documentation.

Assumptions include continuous network operation, no virtualization advantages - meaning that every validator is a different physical server -, and generic cooling overheads. Energy use per validator node is scaled up by the total number of validators, based on every single scenario. Actual numbers may differ based on operational conditions - it is more likely that a combination of virtualization and specifications per scenario are being used - and energy sources.

Benchmarking and Comparative Analysis

Ethereum's shift from PoW to PoS reduced energy consumption by ~99.95%. Klayr's PoS model shares similar principles, ensuring inherently lower energy footprints than PoW (*Comparison with Ethereum's PoS Network - source*).

Unlike PoW, where nodes compete for computational power, Klayr's PoS requires only the essential energy needed for validator operation. As a newer network (launched June 25, 2024), Klayr's absolute energy consumption is much smaller compared to mature networks like Ethereum.

If future standards deem fewer nodes sufficient for decentralization, Klayr can adapt by reducing the required number of validators, lowering energy consumption. Adjusting node requirements and optimizing server configurations can further reduce the network's energy footprint over time.

Data Centers and Sustainable Energy Initiatives

Klayr deploys infrastructure through environmentally responsible partners. Klayr collaborates with Scaleway, a cloud provider committed to reducing environmental impact, ensuring that part of Klayr's validation process rests on sustainable infrastructure. Additional details on Scaleway's environmental efforts can be found here: Scaleway Environmental Leadership. This only refers to the validators that are operated by Klayr Labs and is not an estimate for the whole network.