GOAT Network Economics BeigePaper

Sustainable Yield

Version 2.0

1 Introduction

Bitcoin is widely regarded as digital gold, primarily used by long-term holders as a store of value. However, most BTC sits idle in wallets, offering limited opportunities for yield generation compared to other cryptocurrencies like ETH or stablecoins. This underutilization constrains BTC holders to depend largely on price appreciation, leaving Bitcoin's full potential untapped. The approval of Bitcoin ETFs by the SEC in Jan 2024 has led to a broader adoption of Bitcoin among financial institutions. Major financial entities are now integrating Bitcoin into their portfolios. This trend signifies a shift towards mainstream acceptance of cryptocurrencies in traditional finance. With the increasing adoption of Bitcoin, there is a rising demand for financial products based on Bitcoin. Michael Saylor, the founder of MicroStrategy, has suggested developing Bitcoin-based products that provide lower volatility, downside protection, or dividends to attract more investors.

GOAT Network aims to unlock Bitcoin's untapped potential to benefit all BTC holders. By leveraging innovation such as decentralized sequencers, multi-coin PoS, BitVM2 and zkVM, GOAT Network transforms BTC from a passive into an active asset, ensuring enhanced security and rewards for all BTC holders. **Security:**

- Decentralized Sequencers: GOAT Network employs decentralized sequencers to ensure network integrity and security. By sharing network ownership with outside sequencer node operators, GOAT Network mitigates single-point-of-failure risk and helps ensure 24/7 network liveness.
- Slashability: By making the PoS assets (BTC, DOGE and GOAT tokens) fully slashable, GOAT Network further ensures security. This mechanism deters malicious behavior and incentivizes honest participation, thereby maintaining the integrity and trustworthiness of the network.
- BitVM2 and zkVM: By integrating BitVM2 design and in-house *Zero-Knowledge Virtual Machine (zkVM) technology*, GOAT Network is built to maintain privacy, security and integrity. See GOAT Network whitepaper for more details.

Sustainable BTC Yield:

- Decentralized sequencers and the mult-coin PoS mechanism (see Section 2) establish a market where participants can earn sequencer revenues. Since the gas token for GOAT Network is BTC, sequencer node operators are paid by users in BTC for processing transactions. BTC or Dogecoin holders can share in sequencer revenues through their participation in PoS validation.
- The shared sequencer revenues enable third parties to create yield-bearing assets such as yBTC or yDoge[1] (naming may vary depending on the issuing party). This tokenization allows yBTC to be tradable, thus generating additional returns and creating new opportunities for investors.
- yBTC can be decomposed into pBTC and yToken. This mechanism creates an innovative BTC yield market which generates numerous trading opportunities for BTC suppliers, hedgers, arbitrageurs, and speculators.

[1] Dogecoin suppliers will receive yDoge, similar to yBTC. For simplicity, the rest of this section will focus on yBTC, but everything discussed for yBTC also applies to yDoge.

– Investors can also earn rewards by participating in various dApps within the GOAT Network ecosystem – such as a native borrow/lend platform, multi-use DEX, and more.

In short, GOAT Network's economic model is built primarily on its technological innovation that addresses the security challenges of existing BTC L2 solutions. Decentralized sequencer technology is leveraged to generate returns on BTC from gas fees for investors (PoS participants). Since gas fees (as well as mint/redeem fees) stem from essential network activities, the yield on BTC remains sustainable as long as the network exists. The GOAT Network economy is designed to foster an environment where all participants — Sequencer Operators, Investors, the GOAT Foundation, Ecosystem Partners, and dApp Builders/Teams—thrive through mutual cooperation and shared incentives. Each of these participants plays a crucial role in ensuring the network's efficiency, security, and growth.

A natural question at this stage for any reader is where the yield comes from. In a nutshell, participants of the network share in the following fees or rewards. **Gas Fees:**

– Users pay gas fees for executing transactions and activating smart contracts.

– goatBTC[2] is the designated gas token.

– Sequencers collect gas fees;

  • Part of these fees is paid to validators on the BTC mainnet, and

  • The other part constitutes sequencers' revenue.

Sequencer Revenues/Rewards: Sequencers ensure network integrity and security, receiving revenues in the form of BTC gas fees and mining rewards for sequencers above. **goatBTC Mint/Redeem Fees:**

– goatBTC is minted as 1:1 pegged with BTC.

  • BTC holders lock their BTC on the Bitcoin mainnet to mint goatBTC on GOAT Network.

  • This goatBTC can be used within the GOAT Network Ecosystem, enabling secure transactions and yield generation.

– GOAT Foundation charges fees for minting/redeeming goatBTC, e.g., 0% for minting and 0.2% for redeeming, and the fee is capped at 0.002 BTC.

– The fees are directed to the GOAT Foundation treasury and used for GOAT ecosystem development.

While GOAT Network focuses on unlocking Bitcoin's potential, the lack of yield generation also affects other large-cap, fully decentralized coins like Dogecoin. GOAT Network's yield-generation strategy can also be applied to Dogecoin, allowing holders to supply Dogecoin to decentralized sequencers to earn sustainable returns – "Supply Doge, Earn BTC!". By expanding to other fully decentralized coins, GOAT Network strengthens its position as the sustainable BTC yield chain for the People's coins (see Section 2).

In the following sections, we explain GOAT decentralized sequencers, multi-coin PoS, and the functions, rewards, incentives, and risks associated with each key GOAT Network participant[3]. Section 7 introduces the concept of a BTC-based decentralized financial market. Finally, we will outline Phase 2 of GOAT Network in Section 8, explaining how GOAT Network leverages technological innovations to enhance the network's capabilities, improve liquidity, and build a robust economy.

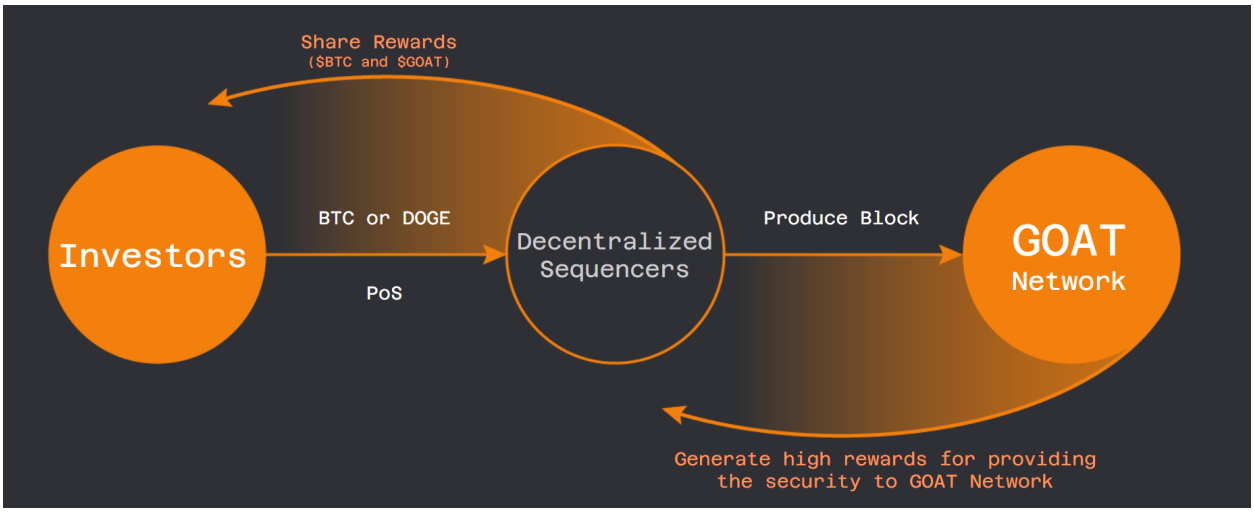
[2] In this paper, we use the term "goatBTC" to distinguish BTC on the Bitcoin mainnet. Upon the launch of the network, the gas token for the GOAT Network will also be referred to as "BTC".

[3] Please note that additional GOAT Network participants may join as the project evolves. The economic paper will be updated accordingly to reflect these changes.

2 Decentralized Sequencer and Multi-Coin PoS

The sequencer system lies at the heart of our network, ensuring that transactions are processed efficiently and securely[4]. GOAT Network pioneers the integration of decentralized sequencers (D-Seq) within L2 solutions.

D-Seq not only enhances network security but also generates real sustainable yield for investors who supply BTC or DOGE in D-Seq. GOAT network's unique multi-coin PoS innovation enables sustainable yield generation with D-Seq. It starts with BTC and DOGE as PoS assets. As shown in the chart below, investors supply BTC or DOGE into D-Seq to earn D-Seq rewards (gas fee in BTC and mining rewards in GOAT tokens).



In the future, the GOAT community will vote for which other coins can be used as PoS assets in GOAT D-Seq. We call those PoS assets the People's Coins which are

- Fully decentralized and diluted
- Over $10 billion market cap
- Over 1 million addresses
- In the market at least 3 years

By enabling the People's Coins to earn yield, GOAT Network helps millions of users unlock more value from their holdings. It's about making crypto work for everyone, from long-time Bitcoin supporters to Dogecoin enthusiasts and much more. With GOAT, the potential of People's Coins is realized.

[4] L2 solutions usually use centralized sequencers, which present several significant issues that can hinder the overall security and efficiency of the system. Firstly, centralized sequencers create a single point of failure, making the network vulnerable to attacks and censorship. If the sequencer is compromised, it can disrupt the entire transaction processing system, leading to potential security breaches and loss of user funds. Secondly, centralized sequencers often lead to unequal profit distribution, where a small group of entities control the majority of the rewards, reducing the incentives for broader community participation. This centralization can also result in biased decision-making and lack of transparency, undermining the trust and decentralization principles that are foundational to blockchain technology.

3 Sequencer Operators

Sequencer operators' role is crucial in maintaining decentralization, optimizing network performance, and supporting BTCFi applications. The functions, rewards, additional incentives, and risks for sequencer operators can be summarized as follows:

- **Function/Mechanism (Operating a Sequencer Node):** Sequencer operators are responsible for validating transactions, maintaining network security, and ensuring the processing of transactions. This involves running a node that processes and sequences transactions on GOAT Network.
- **Rewards: receive approximately 10% of sequencer rewards** (gas fees in BTC and mining rewards, see Section 1 for details) for service fees. This dual-reward system ensures that sequencer node operators are compensated for their work in securing and maintaining the network.
- **Challenges/Risks:**
  - **Operational Challenge:** Running a sequencer node may involve some technical hurdles that require some level of operational knowledge and due diligence.
  - **Financial Risk:** Sequencer operators must lock BTC (or attract BTC-holding partners to lock BTC) to run a GOAT Network sequencer node. If they're found to be acting maliciously or incorrectly validating transactions, their assets can be slashed, resulting in a significant financial loss.
  - **Security Risk:** Sequencers are prime targets for various cyberattacks, including Distributed Denial of Service (DDoS) attacks, hacking attempts, and other exploits aimed at disrupting their operations or stealing funds.

GOAT Network's sequencers are whitelisted to ensure network stability and security. As the network matures, it will transition to an open market where anyone can become a sequencer operator, as long as that party can successfully handle the tech requirements and PoS provision required to run a GOAT Network sequencer node. This shift will create a competitive environment for decentralized sequencers, driving innovation, improving services, and ensuring a fairer distribution of rewards. Investors will have the flexibility to switch to more efficient operators as they see fit.

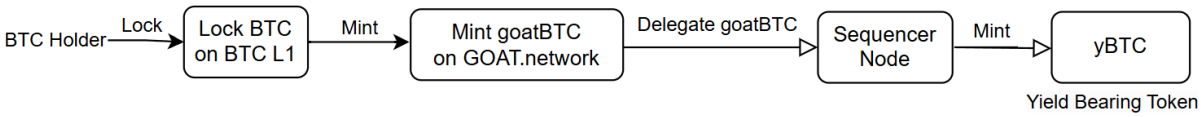
4 Stakers (BTC or Dogecoin Holders)

As discussed in the introduction, our aim is to create an ecosystem that enhances the value of all BTC or Dogecoin holders and allows generation of sustainable yield in this ecosystem. In particular, we note that while currently Bitcoin or Dogecoin miners earn good returns, retail investors can't participate directly in the mining business due to the technical complexity and significant capital requirements involved. GOAT Network addresses this gap in the Bitcoin/Dogecoin ecosystem by allowing retail investors to engage in the ecosystem through mechanisms that simplify access to L2 mining rewards. By locking BTC or DOGE into a sequencer node, stakers can generate yield and contribute to the network's overall stability and growth.

There are two ways to bridge BTC onto GOAT Network and earn sequencer revenues.

(1) BTC holders supply goatBTC to a sequencer node through a smart contract on BTC L2: no time lock; see the chart above.

- Mechanism:
  - Bridge: BTC holders lock BTC on Bitcoin L1 and mint goatBTC on L2.



- Supply: BTC holders supply their goatBTC to a sequencer via a L2 smart contract and get yBTC (via a third-party platform).
- Redemption: BTC holders can return yBTC[5] and **get their goatBTC back any time**. They can also return goatBTC and **get their BTC back any time**.

– Rewards: They earn a share of sequencer revenues, and the return generated by yBTC (for example earning swap translation fees by providing liquidity to goatBTC/yBTC trading pair in a DEX). See next section for detailed description of yBTC.

– Risks:

- The BTC locked into a sequencer can be slashed if the sequencer acts maliciously.
- Bridge and smart contract risk exists for bridging in/out assets. However, this risk can be eliminated with BitVM2 and zkVM implementation.

GOAT Network supports not only native BTC from the mainnet but also considers accepting wrapped versions of BTC. Due to the inherent risks of wrapped BTC, GOAT Network is highly selective, accepting only those with a solid reputation and a proven track record. Currently, we accept BTCB for sequencer supplies.

(2) BTCB holders can bridge their BTCB to GOAT Network and supply those BTCB to a sequencer node through a smart contract on BTC L2: no time lock.

– Mechanism:

- Bridge: BTC holders lock BTCB on BNB Smart Chain (BSC) and mint gBTCB[6] on GOAT Network.
- Supply: BTC holders supply their gBTCB to a sequencer via a L2 smart contract and get yBTCB[7] (via a third-party platform).
- Redemption: BTCB holders can return yBTCB and **get their gBTCB back any time**. They can also return gBTCB and **get their BTCB back any time**.

– Rewards: They earn a share of sequencer revenues, and the return generated by yBTCB in the GOAT ecosystem.

– Risks: all risks in (1) above.

Since yBTC and yBTCB are similar assets on GOAT Network, we will use yBTC for simplicity throughout the remainder of this paper.

The user journey for Dogecoin holders will mirror that of BTCB holders. GOAT Network will initially accept Dogecoin on BSC, allowing users to bridge Dogecoin from BSC to the GOAT Network, supply it to decentralized sequencers, and receive yDoge in return. GOAT Network aims to accept Dogecoin directly from the Dogecoin mainnet by end of 2025.

Key benefits to BTC or DOGE holders can be summarized as follows:

[5] The yBTC is a tradable yield-bearing token whose value consists of two parts: the underlying BTC (1:1) and sequencer rewards (for supplying that BTC into the sequencer). Note that each sequencer can issue their own version of yBTC, as the amount of revenues generated by sequencers may vary.

[6] In this paper, we use the term "gBTCB" to distinguish BTCB on BSC. Upon the launch of the network, the bridged token of BTCB is also referred to as "BTCB" on GOAT Network.

[7] yBTCB is similar to yBTC, but its underlying asset is gBTCB instead of goatBTC.

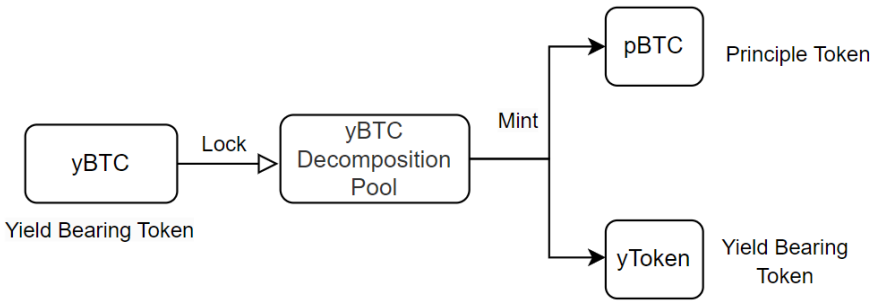
- **Open to all BTC or DOGE Holders:** the decentralized sequencer system allows all BTC or DOGE holders to participate actively in the network.
- **Sustainable Yield on BTC:** By participating in sequencer staking, participants can enjoy long-term sustainable yields on their Bitcoin in both BTC and goatBTC. In addition, yBTC (a yield-bearing token that accrues sequencer rewards) can generate additional returns in our ecosystem. We discuss this in more detail later in this document.
- **Enhanced Security and Efficiency:** Decentralized sequencers ensure high security and efficiency, reducing the risks associated with traditional centralized systems.

5 Tokenization of Sequencer Rewards

Before addressing the remaining parties in the GOAT ecosystem, we would like to further discuss the tokenization of sequencer rewards. This is important because rewards to our ecosystem are closely related to the tokenization of sequencer rewards. Everything discussed about BTC in this section also applies to Dogecoin. For simplicity, we will focus the discussion on BTC.

As discussed in the previous section, investors can supply their goatBTC to a sequencer node to mint yBTC (via a third-party platform), a yield-bearing token that accrues sequencer rewards. yBTC is 1:1 pegged with goatBTC. This process tokenizes the sequencer rewards, making them tradable. Note that yBTC is issued by a sequencer or a sequencer league, not by GOAT Network. This is because sequencers are the entities that collect sequencer rewards, and only they have the capability to tokenize these rewards.

yBTC can be further locked in a decomposition pool to mint additional tokens. The chart below illustrates the creation of two synthetic assets that are contingent on yBTC, namely pBTC and yToken. pBTC is the principal token, while yToken is the yield-bearing token that holds sequencer rewards from yBTC for a specified period. See below for details.



Note that pBTC and yToken can have specific maturity dates, i.e. 3 months, 6 months, 1 year, or even perpetual. For example, yBTC may be decomposed into pBTC and yToken with a 3-month maturity period.

- The yToken, acting as a yield bearing token, holds the sequencer rewards for the next 3 months;
- The pBTC acts as a principal token on yBTC, discounted from the yield given by yToken, with 3-month maturity;
- After 3 months, the sequencer rewards from the yToken are fully accrued, and the pBTC holder can return the pBTC to that decomposition pool to get the yBTC back.

This mechanism creates an innovative BTC yield market through yBTC, which stands apart from traditional lending and borrowing markets by deriving the equivalent of yields from sequencer revenues. This new yield market will interact with BTC and other BTC yield products, generating a multitude of trading opportunities for BTC suppliers, hedgers, arbitrageurs, and speculators.

It is important to note that **GOAT Network is the first to enable the creation of different yield-bearing tokens with varying maturity periods. This is possible because the rewards to yBTC are native to our network and not tied to just sporadic airdrops or other limited-time-only events.** As discussed above, our network design makes the rewards in yBTC permanent, as long as the BTC holder shares in the sequencer rewards.

Positive Feedback Loop

The profits generated by sequencers, primarily from gas fees, are distributed to users through yBTC. As transaction volume increases, gas fees rise, leading to higher profits for sequencers, which creates a positive feedback loop. The feedback loop that we discuss below not only enhances the utility and value of yBTC and yToken; it also drives the growth and sustainability of GOAT Network. By aligning the incentives of participants with the network's growth, GOAT ensures a thriving ecosystem that benefits all stakeholders.

- **Increased Transactions Lead to Higher Gas Fees:** As the number of transactions on GOAT Network grows, the demand for gas increases. This results in higher gas fees, which directly translate into greater profits for sequencers.
- **Higher Profits Make yBTC and yToken More Attractive:** The increased profits from gas fees enhance the attractiveness of yBTC and yToken. These tokens provide holders with a share of the profits generated by the network, making them valuable assets.
- **Attraction of More Participants:** The promise of higher returns draws more participants to the network. Investors and users seeking yield opportunities are incentivized to participate in the GOAT ecosystem by acquiring and staking yBTC and yToken.
- **Increased Market Activity:** As more participants join the network, overall market activity increases. This leads to more transactions, which in turn generates more gas fees and sequencer profits.
- **Reinforcement of the Feedback Loop:** The cycle continues, creating a positive feedback loop where increased transactions lead to higher profits, attracting more participants, and further boosting market activity.

Additionally, as the network develops, there will be various DeFi products (see Section 8) built by third parties on GOAT Network. These products generate more transactions, thereby contributing to the feedback loop, ensuring sustained growth and a robust ecosystem.

6 GOAT Foundation and Ecosystem Partners

The GOAT Foundation and its treasury play important roles in supporting ecosystem development and ensuring the long-term sustainability of GOAT Network. By strategically managing resources and fostering innovation, these entities help to create a robust ecosystem.

The Foundation funds dApp teams and ecosystem partners through grants and incentives, driving innovation and attracting users. It also supports marketing and outreach to expand network adoption. Managed by the Foundation, the GOAT treasury fund supports liquidity provision and staking programs, offering incentives to participants who contribute to the network's liquidity pools. By

doing so, the Treasury ensures that there is ample liquidity for transactions and trading activities, making the network more attractive to users and investors alike.

Ecosystem Partners and dApp Teams are also critical to GOAT Network's growth. They receive support and funding from the GOAT Foundation, which helps them develop and integrate innovative applications on the network. This creates a dynamic ecosystem where new services and products continuously enhance the network's value proposition. As these dApps and services attract more users, transaction volumes increase, generating more fees and rewards for all participants. This positive feedback loop ensures that everyone—from Sequencer Operators and Investors to Ecosystem Partners and dApp Teams—benefits from the network's success.

7 BTC-Based Decentralized Financial Market

We have discussed GOAT Network's BTC yield market in Section 4. We anticipate seeing more BTC-related financial products (built by third parties) on GOAT Network such as stablecoins, synthetic assets, insurance products, derivatives, etc. Essentially, a **BTC-Based Decentralized Financial Market** can be established on GOAT Network, **secured by BTC, based on BTC, with yield collected in BTC, and more**.

One noteworthy aspect is the collateral market. The BTC collateral market is currently small and inactive due to security issues and the lack of reliable sources for generating returns on BTC. However, GOAT Network's solution of enhanced security and yield generation aims to invigorate the BTC collateral market. BTC-based collateral products include but are not limited to:

- **Borrowing and Lending:** BTC holders can use their assets as collateral to obtain loans. This mechanism allows for the lending and borrowing of BTC with confidence in security and attractive interest rates due to the sustainable yields generated on the collateral. The entire process is managed through smart contracts, ensuring full transparency in how the collateral is used to generate yield (see example with a chart below).
- **Synthetic Assets:** By using BTC as collateral, synthetic assets representing other cryptocurrencies, commodities, or stocks can be minted. These synthetic assets allow BTC holders to gain exposure to a wide range of markets without directly holding the underlying assets.
- **Stablecoins and Interest-Free Loans:** BTC collateral can be used to mint stablecoins, which are pegged to fiat currencies. Decentralized platforms like MakerDAO (on Ethereum) have shown the viability of using crypto as collateral to generate stablecoins. Additionally, interest-free loans can be offered where the collateral itself generates enough yield to cover the loan's costs.
- **Insurance Products:** BTC can be locked as collateral to underwrite insurance policies, providing coverage for various risks. This adds another layer of financial utility to BTC, expanding its use case within the DeFi ecosystem.

GOAT Network can use smart contracts to significantly enhance the collateral market (see the GOAT Network full Econpaper for an example). We truly believe that our BTC-based decentralized financial market is not merely mimicking traditional finance but enhancing it. Our approach goes beyond lowering counterparty risk and intermediary fees; it fundamentally enables financial engineering that is not easily accommodated in traditional finance. By leveraging the unique capabilities of blockchain technology and minimizing adverse selection problems through smart contracts, we are opening new avenues for financial engineering, diverse cross-market innovation, and efficiency in the digital financial sector. This allows us to create useful products and services that are secure, transparent, and accessible to a broader range of users (BTC suppliers, hedgers,

arbitrageurs, speculators, etc.). By leveraging the full potential of BTC, GOAT Network will pave the way for a more inclusive and efficient financial future.

8 Phase 2 of GOAT Network

GOAT Network Phase 1 provides a secure Bitcoin Layer 2 solution, enabling BTC to safely enter the DeFi world. Through decentralized sequencers, BTC holders are offered sustainable yields. Additionally, by tokenizing sequencer revenues, these can be traded and split, not only providing more liquidity to the market but also establishing an innovative BTC yield market. As more BTC flows into Layer 2, we anticipate seeing more BTC-related financial products such as stablecoins, synthetic assets, insurance products, derivatives, etc. In essence, a BTC-Based Decentralized Financial Market can be built on GOAT Network.

One of the limitations of current L1 and L2 solutions is that applications are often siloed within a single network, limiting their utility and interaction with other ecosystems. In Phase 2, GOAT Network plans to implement **Entangled Rollup (ER) technology, which will enable efficient cross-chain transactions, ensuring that native assets can move seamlessly between different blockchains while maintaining high throughput and low fees.** This fosters innovation and expands the network's utility, establishing unified liquidity for GOAT Network.

This unified liquidity will allow for a more interconnected and fluid ecosystem. This enhancement will also significantly improve liquidity and trading volumes within GOAT Network, fostering a more dynamic and efficient market environment. The open ecosystem provides incentives for dApps to partner with GOAT Network, as they won't have to readapt to different L1s. Enhanced liquidity mechanisms will also support more sophisticated financial products and services within the network.

As more L1 blockchains are connected to GOAT Network, we anticipate a proliferation of dApps and increased liquidity across the ecosystem. This expansion will result in a larger and more dynamic decentralized financial market. With more dApps and liquidity, sequencers will be able to earn more gas fees, leading to higher returns for those supplying with sequencers. This increase in gas fee revenue creates more sustainable yields, which further incentivizes participation and investment. By fostering a collaborative environment where all participants can thrive, GOAT Network aims to create an economy that benefits everyone involved.

9 Conclusion

GOAT Network's economic model leverages advanced technological innovations to address the key challenges faced by existing BTC L2 solutions, particularly in the areas of security and yield generation. By integrating BitVM2, zkVM technology, and decentralized sequencers, GOAT Network inherits the robust security of the Bitcoin mainnet, while returning BTC from a passive to an active asset and creating a sustainable yield on BTC through essential network activities, such as gas fees and mint/redeem fees.

GOAT's decentralized sequencers not only ensure the network's integrity and security but also generate substantial returns for BTC holders. This innovative approach includes the creation of a BTC yield market through the tokenization of sequencer revenues, offering diverse trading opportunities and enhancing liquidity. As more BTC flows into Layer 2, a wider range of DeFi products can be developed, enabling the construction of a BTC-based decentralized financial market on GOAT Network. GOAT decentralized sequencers accept multiple assets for PoS. This allows GOAT Network

to generate sustainable yields for BTC holders and holders of People's coins, such as Dogecoin. It positions GOAT Network as the sustainable BTC yield chain for the People's coins.

The GOAT Network ecosystem is meticulously crafted to foster mutual cooperation and shared incentives among all participants, including Sequencer Operators, Investors, the GOAT Foundation, Ecosystem Partners, and dApp Teams. Each participant plays a vital role in ensuring the network's efficiency, security, and growth, thus creating a thriving and dynamic environment.

As the network evolves, the introduction of a universal L2 solution for any L1 network in Phase 2 will further enhance interoperability and liquidity across chains, elevating the benefits and capabilities of GOAT Network. This will solidify GOAT's as a pioneering force in the blockchain ecosystem, providing a secure, efficient, and rewarding platform for all participants.

In summary, GOAT Network not only addresses the immediate needs of BTC L2 solutions; it also lays the groundwork for a scalable, secure, and interconnected blockchain future.