Etherlink Ecosystem Report: Scaling Tezos with an EVM-compatible, non-custodial Layer 2

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Presented by The Tie

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Introduction

Etherlink represents a comprehensive extension of the Tezos ecosystem, introducing Ethereum Virtual Machine (EVM) compatibility through an optimized Layer 2 solution. As the blockchain industry increasingly demands interoperability between ecosystems, Etherlink addresses a critical gap by bringing the vast Ethereum developer community and tooling to Tezos while maintaining Tezos' fundamental security and governance advantages. This strategic bridge enables Tezos to access the largest smart contract ecosystem while offering EVM developers enhanced performance, reduced costs, and improved security guarantees.

What is Etherlink?

Etherlink is an EVM-compatible, non-custodial Layer 2 blockchain powered by Tezos Smart Rollup technology. It enables both developers and everyday crypto users to leverage familiar Ethereum tools—including wallets, indexers, and development frameworks—while facilitating asset transfers between EVM-compatible chains and the Tezos ecosystem.

Etherlink Connects

The blockchain landscape has historically been fragmented, with ecosystems developing in relative isolation and no way to directly connect crypto ecosystems. This fragmentation creates significant friction, limiting network effects and forcing developers to choose where they spend most of their time and resources. Etherlink eliminates this dilemma by creating a seamless bridge between the Ethereum and Tezos ecosystems, allowing applications to benefit from the strengths of both platforms.

Technical Foundation

Built on Tezos Smart Rollup technology, Etherlink employs optimistic rollups that bundle multiple transactions and process them outside the main Tezos network. This architecture significantly reduces the load on Layer 1 while maintaining Tezos' security guarantees. By processing transactions on Layer 2 and posting cryptographic proofs to the main chain, Etherlink achieves substantial scalability improvements without compromising security or decentralization principles.

Performance Metrics

Etherlink achieves superior transaction processing speeds with sub-second confirmation times:

- Transaction confirmation: < 500ms through the sequencer
- Comparative performance: Faster than Optimism Bedrock (~2 seconds) and comparable to Arbitrum One (~300ms)
- Data posting to Layer 1: ~10 seconds
- Post-Calypso upgrade performance boost: Up to 30x improvement for specific operations

These metrics enable time-sensitive applications that require immediate transaction finality, such as high-frequency trading and real-time settlement systems.

Economic Efficiency

Etherlink Cost Comparison

ERC-20 TRANSACTION

Chain	Cost	Cost Comparison (vs. Etherlink)
Etherlink	$0.001	-
Ethereum Mainnet	$0.50 - $5.00	500x - 5000x more expensive

e.g., Transferring $100 worth of tokens could cost $0.001 on Etherlink vs. $0.50 - $5.00 on Ethereum Mainnet.

SMART CONTRACT DEPLOYMENT

Chain	Cost	Cost Comparison (vs. Etherlink)
Etherlink	$0.05	-
Ethereum Mainnet	$20.00 - $200.00	400x - 4000x more expensive

e.g., Deploying a standard ERC-721 contract might cost $0.05 on Etherlink vs. $20.00 - $200.00 on Ethereum Mainnet.

GENERAL TRANSACTION COSTS (PER TRANSACTION)

Chain	Cost	Cost Comparison (vs. Etherlink)
Etherlink	$0.001	-
Arbitrum	$0.10 - $0.25	100x - 250x more expensive
Optimism	$0.15 - $0.30	150x - 300x more expensive
Ethereum Mainnet	$0.50 - $5.00	500x - 5000x more expensive

e.g., A typical DeFi swap might cost $0.001 on Etherlink, compared to $0.10-$0.25 on Arbitrum, $0.15-$0.30 on Optimism, or $0.50-$5.00 on Ethereum Mainnet.

Figures 1.1 and 1.2: Etherlink Cost Analysis. Figure 1.1 provides detailed tabular comparisons across different operation types with calculated savings factors. Figure 1.2 displays a logarithmic bar chart of transaction costs across blockchain platforms

This cost structure enables previously univable use cases, particularly those requiring high transaction volumes or micropayments

Infrastructure and Governance Design

Etherlink operates through two distinct systems that relate to Tezos Layer 1 in different ways:

- Smart Rollup Infrastructure: As a Smart Rollup, Etherlink utilizes the permissionless fraud-proof infrastructure enshrined in Tezos L1, enabling anyone to run a node, post state commitments, and challenge other operators
- Synchronized External Governance: Etherlink governance operates through separate contracts independent of L1 governance, but synchronizes with Tezos bakers who use their L1 voting power to govern kernel upgrades, security patches, and sequencer operator changes

- Coordinated Governance Periods: Etherlink governance periods are synchronized with Tezos L1 governance periods to maintain consistent baker voting power, though Etherlink can run multiple shorter governance cycles within a single L1 period

This approach maintains decentralization principles while providing governance autonomy for Layer 2-specific needs, leveraging Tezos' technical infrastructure for security and its proven governance participants for democratic legitimacy without creating direct dependencies between the governance systems.

Bridging Technology

Etherlink facilitates secure, non-custodial asset transfers through its bridging infrastructure:

- Bidirectional token transfers between Tezos Layer 1 and Etherlink
- Deposit availability: Immediate
- Withdrawal period: 15 days (aligned with Smart Rollup refutation period)
- Bridge security: Permissionless, trustless operation through automated, transparent, and audited smart contracts

Token support: Native XTZ and FA tokens (FA1.2 and FA2) from Tezos Layer 1 to ERC-20 tokens on Etherlink

This bridging technology enables efficient capital utilization and seamless cross-chain liquidity movement.

Development Timeline

Privacy Solutions Comparison

Critical Factor	Public L1 using ZKP/HE	L2s/Sidechains Targeting Privacy	Public L1 with Smart Contract Privacy
Examples	Solana Confidential Transfers	Aztec	Canton Network
What You Get	Partial privacy: Hides some data (e.g., transaction amounts). Everything else remains public	All data shielded by default: With optional selective disclosure	Configurable privacy: Granular, native control over data visibility

Figure 2: Development timeline of Etherlink. An overview of Etherlink's development updates, up to and including the most recent Dionysus Upgrade which launched in May '25.

- First Kernel Upgrade (July 2024): Enhanced EVM endpoint support, improving compatibility with standard Ethereum interaction patterns and developer tooling.
- Bifröst Upgrade (November 2024): Expanded bridging capabilities to include FA tokens from Tezos Layer 1 to ERC-20 tokens on Etherlink, while introducing support for the callTracer, enabling integration with transaction indexing tools like the Blockscout explorer.
- Calypso Upgrade (March 2025): Delivered substantial performance enhancements through:
  - Enhanced virtual machine caching
  - Reduced disk footprints for nodes
  - Updated governance contracts
  - Improved sequencer notification systems
  - Laid the foundation for faster withdrawals from Etherlink to Tezos Layer 1

- Dionysus Upgrade (May 2025): The most significant upgrade to date, addressing economic efficiency and scalability:
  - Enhanced virtual machine caching
  - Reduced disk footprints for nodes
  - Updated governance contracts
  - Improved sequencer notification systems
  - Laid the foundation for faster withdrawals from Etherlink to Tezos Layer 1

Strategic Partnerships

Etherlink's ecosystem continues to establish key strategic collaborations:

- Exaion Validator Integration (April 2025): Exaion, backed by France's EDF Group, joined Etherlink as a validator, representing significant institutional endorsement. This partnership strengthens Etherlink's validator set with an established enterprise participant, enhancing decentralization and security.

- Thirdweb Partnership (November 2024): Thirdweb and Etherlink have established a technical integration that enables developers to build, deploy, and manage decentralized applications (dApps) on Etherlink using Thirdweb's comprehensive suite of web3 development tools, including client-side SDKs, backend APIs, performant RPCs, and pre-built contract templates to build on Etherlink.

- Transak Integration (June 2024): This fiat on-ramp solution streamlines asset acquisition on Etherlink without requiring interaction with traditional exchanges. The partnership reduces regulatory complexity and improves accessibility for regulated entities and retail users alike. In January 2025, this integration expanded to include Uranium.io, enabling tokenized uranium trading through Etherlink and the Tezos infrastructure—a pioneering implementation of real-world asset tokenization.

DeFi & Real World Assets (RWAs)

Etherlink's architecture creates an optimal environment for decentralized finance applications and tokenized real-world assets:

- DeFi Protocols: The platform's cost efficiency and rapid confirmation times enable competitive automated market makers, lending protocols, and derivatives markets that require frequent transactions and real-time operations. The Calypso upgrade's 30x performance improvement specifically enhanced DeFi application performance. This theoretical advantage has translated into substantial real-world adoption. IguanaDEX, a decentralized exchange on Etherlink, recorded $150 million in trading volume as users capitalize on arbitrage opportunities. Meanwhile, Superlend has emerged as a cornerstone of Etherlink's DeFi infrastructure, with deposits reaching $16.93 million and active borrowing at $10.49 million.

- RWA Tokenization: Etherlink supports the representation of traditional assets like real estate, commodities, and financial instruments as on-chain tokens, benefiting from both Ethereum's tokenization standards and Tezos' security guarantees. The recent Uranium.io integration exemplifies this capability, enabling tokenized uranium trading through the combined Etherlink-Tezos infrastructure with $6.46 million in total value locked. Additionally, the issuance of tokenized treasury bills on Etherlink by projects like SPIKO and Midas further underscores Etherlink's suitability as a platform for RWAs.

- Cross-Chain Liquidity: The bridging capabilities facilitate efficient capital movement between ecosystems, enabling sophisticated yield strategies and improved liquidity utilization. Etherlink's Total Value Locked (TVL) has shown remarkable growth, increasing from $1.4 million to over $28 million in a single month following the implementation of the $3 million Apple Farm rewards program launched in March 2025. This 20x increase exceeds initial growth targets and demonstrates accelerating ecosystem adoption by both users and developers.

Developer Experience and Support

Etherlink lowers entry barriers for developers by supporting standard Ethereum development tooling:

- Development Frameworks: Full compatibility with Solidity, Hardhat, Truffle, and other Ethereum development environments
- Infrastructure Services: Support for familiar node providers, indexers, and oracles
- Technical Documentation: Comprehensive resources covering migration from Ethereum, optimization techniques, and Tezos-specific considerations

Tezos Developments Supporting Etherlink

Etherlink's capabilities are being enhanced through ongoing Tezos ecosystem improvements:

- Quebec Upgrade (Activated January 20, 2025): This significant protocol upgrade reduced block time from 10 seconds to 8 seconds, moving toward a target of 5-second block times. The reduced block time brings transaction finality down to 16 seconds and substantially improves Etherlink's Layer 1 data posting efficiency. The upgrade was activated at block #7,692,289 and represents a critical performance enhancement for the entire Tezos ecosystem. With transaction finality at 16 seconds, the Tezos blockchain now settles transactions approximately 56 times faster than Ethereum's Layer 1 (~15 minutes) and maintains competitive performance against other high-speed networks like Solana (~13 seconds), positioning Etherlink as one of the most efficient EVM-compatible environments in the market.

- Complementary Rollup Solutions: Parallel development of JavaScript Rollup (Jstz) and Michelson Rollup (TezLink) creates opportunities for cross-rollup composability and specialized application environments. These additional rollup technologies expand the overall Tezos rollup ecosystem, allowing developers to select the optimal environment for their specific application requirements.

- Data Availability Layer (DAL): The DAL receives direct incentivization through the Rio upgrade's reward allocation mechanism. This critical infrastructure component enhances network bandwidth to make rollups like Etherlink faster and more cost-effective. With 31% of baking power already participating in DAL attestation and steadily increasing toward the 66% operational threshold, the network is progressing toward significantly expanded data throughput capabilities for Layer 2 solutions, directly benefiting Etherlink's transaction processing capacity.

- Rio Upgrade (Activated May 1, 2025): Tezo's 18th protocol upgrade, activated at block #8,767,488, introduces several key enhancements directly benefiting Etherlink. The upgrade reduces cycle length from 3 days to 1 day, accelerating changes made by bakers, stakers, and delegators. It also reduces their unstaking time to just 4 days—a significant improvement for liquidity providers and institutional participants. Most crucially for Etherlink, Rio allocates 10% of participation rewards to Data Availability Layer (DAL) participation, incentivizing the network infrastructure essential for Layer 2 scalability. The upgrade also improves network resilience by reducing tolerance for baker inactivity to 2 days, ensuring more consistent block production and transaction processing. These changes represent a deliberate advancement toward the Tezos X roadmap, which aims to position Tezos as a leading platform for cross-chain interoperability and scalable applications.

Etherlink in the Blockchain Landscape

Etherlink positions itself at the convergence of ecosystem interoperability, institutional requirements, and developer accessibility. By bridging previously isolated blockchain communities, Etherlink contributes to a more interconnected and efficient blockchain landscape where applications can leverage the unique strengths of different protocols without sacrificing compatibility or user experience.

Etherlink Data integration with The Tie Terminal, deployed in May 2025, enhances data accessibility and transparency, providing stakeholders with comprehensive analytics for data-driven decision-making.

Essential Resources

Institutional stakeholders and developers can access comprehensive resources through:

- Official Documentation: https://docs.etherlink.com/
  - Getting started guides
  - Technical specifications
  - Migration tutorials from Ethereum

- Block Explorers:
  - Testnet: https://testnet.explorer.etherlink.com/
  - Mainnet: https://explorer.etherlink.com/

- Development Tools:
  - Testnet: https://testnet.explorer.etherlink.com/
  - Mainnet: https://explorer.etherlink.com/

Participation Methods

Organizations can engage with Etherlink through multiple channels:

- Integration for Developers:
  - Connect wallet to Etherlink network (RPC: https://mainnet.etherlink.com)
  - Bridge assets using the official bridge interface
  - Deploy contracts using standard Ethereum development workflows

- Running Infrastructure:
  - Node operation documentation: https://docs.etherlink.com/network/smart-rollup-nodes
  - Sequencer participation guidelines: https://docs.etherlink.com/network/operators/#sequencer

- Protocol Governance:
  - Voting mechanism guidelines: https://docs.etherlink.com/governance/how-is-etherlink-governed
  - Proposal submission process: https://docs.etherlink.com/governance/how-do-i-participate-in-governance

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