

Riverex Decentralized Exchange
WHITEPAPER
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www.riverex.io

by



Blockchain Commodities

www.blockchaincmdt.io

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Disclaimer

This whitepaper is designed to provide information about Riverex, a decentralized exchange platform, and the technology that supports it.

It is provided for informational purposes only and should not be interpreted as investment advice, endorsement of any specific project or cryptocurrency, a prospectus, offer of securities, solicitation of investment, or offer to sell any product, item, or asset (whether digital or otherwise).

The technology and concepts described in this whitepaper are innovative and subject to change. Riverex retains the right to amend this whitepaper at any moment to improve its accuracy and quality. Any updates to the document will be published and made publicly available.

The company has made extensive efforts to ensure the material's quality and reliability in this whitepaper. We cannot, however, guarantee the precision of all submitted information, and we offer no warranties or representations about its accuracy, reliability, or completeness.

To better understand the project, all potential users of the Riverex platform should study all of the company's information and thoroughly understand the business concept.

The company will not be held liable for any loss or damage incurred as a result of using the platform.

We recommend conducting your own research and due diligence before making any investment decisions.

I. Executive Summary

A. Introduction

Decentralized exchanges (DEXs) have evolved to respond to the crypto industry's centralization problem. ^[1]

DEXs provide traders with an alternate, more secure, and more inclusive choice of trading platforms. It enables increased security, anonymity, and accessibility in the crypto market by utilizing decentralized networks driven by a community of users. ^[2]

A decentralized exchange is a peer-to-peer (P2P) marketplace that allows users to trade cryptocurrencies without intermediaries. ^[3]

It runs on a distributed ledger or blockchain that enables users to keep control of their assets while lowering the risk of hacking or manipulation. Additionally, DEXs use Automated Market Maker (AMM) methods to facilitate trades and are a significant component of the decentralized finance (DeFi) ecosystem. ^[4]

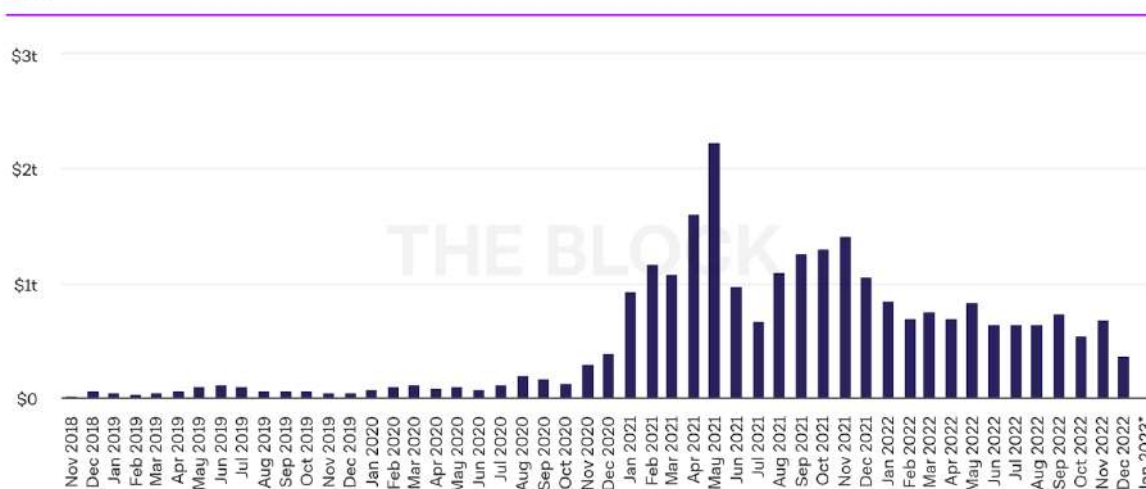
1) Market Analysis

Overall, 2022 has been a challenging year, both in financial markets and worldwide, with Russia's invasion of Ukraine and China-US tensions rising.

In particular, the crypto industry experienced one of the primary drops in global markets in 2022. ^[5]



Cryptocurrency Exchange Volume (The Block Legitimate Index)



SOURCE: CRYPTOCOMPARE
 UPDATED: JAN 1, 2023

Figure 1

During the uncertainty surrounding FTX's collapse, daily transaction volumes increased significantly, culminating in a November surge. According to The Block's crypto exchange volume index, genuine trading volume in October

2022 was \$543.67 billion, with an increase of roughly 23.79% to \$673.01 billion in November 2022.

As December 2022 drew to a close, figures revealed that the total volume for the month was approximately \$357.48 billion, a 46.88% drop from the previous month.

It is important to note that the November spike came amid a period of increased market volatility and uncertainty, which most likely contributed to the increase in trading activity.

Yet, these data show the volatile nature of the crypto industry and emphasize the significance of regularly following market trends and changes. ^[6]

2) Challenges

Decentralized exchanges (DEXs) have attracted much interest in recent years because of their security, transparency, and autonomy over centralized exchanges.

Yet, despite their potential benefits, DEXs confront several obstacles, including liquidity, user experience, regulation, security, and interoperability. ^[7]

Insufficient liquidity is a significant issue for DEXs, making it possible for traders to complete large trades with severe slippage. As a result, it may deter institutional investors and traders from wanting higher liquidity levels.

DEXs face user experience issues, such as needing to be more user-friendly and experiencing slower transaction times due to on-chain confirmations. Because of their decentralized operations, DEXs face regulatory uncertainty, making it difficult for authorities to enforce regulations.

Although more secure than centralized exchanges, DEXs can still be hacked due to smart contract flaws. Finally, interoperability between DEXs is challenging due to varying protocols and standards.

3) Solutions

DEXs first debuted in 2014; however, when decentralized financial services built on blockchain gained traction and automated market maker (AMM) technology helped alleviate liquidity issues, these platforms gained more popularity. ^[8]

The liquidity issue faced by DEXs can also be addressed by utilizing cross-chain transactions that allow access to liquidity from several blockchain networks.

Each blockchain's limitations on order processing speed and transaction fees for DEXs can be addressed by developers exploring alternative blockchains, which offer faster dApp development and interoperability between blockchains to improve market liquidity.

Riverex, a developing decentralized exchange platform, has taken a step forward to address these issues, providing control over users' assets, an innovative level of security, and no KYC procedure required.

Thereby, DEXs are expanding and evolving, with self-executing smart contracts paving the way for new applications and breakthroughs.

II. Blockchain Commodities

To address the challenges mentioned in decentralized platforms, Blockchain Commodities, one of the growing custom blockchain software development firms, has developed the Riverex DEX platform.

The parent company focuses on developing decentralized ecosystems and initiatives that combine blockchain technology into current services.

Blockchain Commodities drive for effective digitalization and assist businesses in swiftly expanding and participating in the broader use of blockchain technology. The company enables organizations to enter the blockchain and DeFi industries quickly and confidently, employing the relevant technology to optimize performance through professional assistance and top-tier solutions.

A. Blockchain Commodities Ecosystem

1.) Riverex

Riverex is a decentralized cryptocurrency exchange with a Peer-to-Peer in-chat functionality featuring encrypted messaging using Signal Protocol. By using smart contracts, the platform enables cross-chain, P2P exchanges, and liquidity pool transactions without the need for an intermediary.

2.) Hippo Wallet

Hippo Wallet is a non-custodial, multi-signature decentralized cryptocurrency wallet that gives users total control over their money safely and securely. It offers a simple and safe method of connecting to blockchain-based apps.

3.) *RiverPay*

RiverPay offers a comprehensive solution for cryptocurrency payments for businesses and retailers, including a Web Gateway with online store plug-ins, a POS Gateway with a RiverPay application functioning as a POS Terminal, and a Merchant Panel as a control center.

4.) *Chain Core*

Chain Core is a blockchain software development service for businesses and small enterprises. With Chain Core white-label solutions, businesses can build and customize their network under their own brand.

III. The Riverex Platform

A. What is Riverex?

Riverex is a developing decentralized cryptocurrency exchange that is distinguished by its unique Peer-to-Peer in-chat and Atomic Swap features.

Because the platform allows traders to execute peer-to-peer swaps in multiple blockchains, it is an excellent alternative among users looking for an advanced decentralized trading experience.

Furthermore, the platform incorporates an Automatic Market Maker system, which provides dynamic market liquidity for crypto assets.

One of the platform's primary benefits is its pseudonymity feature. Riverex respects its users' privacy; therefore, its Peer-to-Peer chatrooms are end-to-end encrypted using Signal Protocol, ensuring private and secure conversations.

Riverex offers cross-chain atomic swaps using smart contracts and can handle swap requests on six blockchain networks, including Ethereum, Binance, Polygon, Moonbeam, Tron, and Fantom (with additional upcoming networks).

The platform also administers Liquidity Pools, which allow users to provide liquidity to the market and earn LP tokens, which will, in turn, be traded for other tokens supported by the platform.

Riverex ensures the security and confidentiality of users' assets by employing secure smart contracts, guaranteeing that transactions are completed transparently and tamper-proof.

Additionally, the platform is packed with cutting-edge features that enable users to trade swiftly and efficiently, including a user-friendly interface, real-time price feeds, and automated trading pools.

B. Features of the Riverex Platform

1.) Public and Private Chat

Riverex's chat rooms provide a unique opportunity for cryptocurrency traders to engage and exchange ideas with like-minded individuals. These chat rooms are accessible in both public and private settings.

The platform allows users to negotiate transactions and directly start Peer-to-Peer (P2P) swap requests inside the chatrooms, resulting in a smooth and efficient trading experience.

Riverex prioritizes its users' security by ensuring that all discussions in the Peer-to-Peer chat rooms are end-to-end encrypted. It implies that any information communicated in these chat rooms is completely secure; even Riverex cannot access it.

2.) Peer-to-Peer Swap

Peer-to-peer (P2P) trading is an innovative technique for buying and selling cryptocurrencies that eliminates intermediaries from the transaction process.

Because of the lack of intermediaries, traders may execute transactions of any size and frequency, making it an excellent alternative for small and large traders.

Users deal and negotiate agreements directly with one another in P2P trading, giving them more control over who they purchase from and sell to, pricing, and settlement time.

One distinct characteristic of P2P trading is the use of smart contracts. These self-executing contracts make transactions more manageable by automatically validating the two parties' agreement terms. It further adds security and verification, making it a safe way to swap cryptocurrencies.

a. Counter Swap

A counteroffer template is generated if a swap request does not meet the user's requested swap price. This template is then delivered to the receiver via the in-chat function, where they may make their own offer.

It allows traders to customize their exchange rates, pick the best offer, and complete a smooth transaction inside a single platform.

3.) Atomic Swap

An atomic swap is a peer-to-peer technology that allows the cryptocurrency of one blockchain to be exchanged with an asset from another blockchain.

It enables two parties to trade directly with one another in a trustless way, using smart contracts and cryptographic hash functions (HTLC - Hashed Time Lock Contract). These functions ensure that the transaction is secure and transparent.

Riverex supports multiple blockchains with a wide range of cryptocurrencies. Users can trade across Ethereum, Binance, MoonBeam, Polygon, Fantom, and Tron. The platform offers over 270+ cryptocurrencies, including fan and game tokens.

a. 2-Step Single-Chain Swap *(Upcoming Feature)*

The Riverex 2-step single-chain swap allows users to execute transactions more efficiently, feasibly, and quickly.

It only performs on one blockchain network, leading to an efficient asset exchange, and entails only two steps, making it more user-friendly.

Furthermore, the transaction processing time is reduced because there is simply an exchange of cryptographic hashes to be confirmed.

b. NFT Atomic Swap

Riverex has integrated the atomic swap/exchange of ownership of non-fungible tokens (NFTs) as an additional trading approach.

It supports the NFT standards ERC-721 and ERC-1155, allowing users to transact multiple NFTs in a single contract with a safe transfer function in the event that the other party does not fulfill the terms.

NFT atomic swap uses a smart contract allowing two parties to trade NFT assets simultaneously while maintaining the transaction's security and transparency.

Riverex enables one to swap NFT to NFT, NFT to token, or token to NFT transactions, making digital asset execution more accessible and versatile.

4.) Liquidity Pool

A liquidity pool is a decentralized finance (DeFi) mechanism that allows users to create a pool, add liquidity, and swap crypto assets in a trustless and efficient way.

It is a pool of funds established on smart contracts that are used to offer liquidity for a particular trading pair on a DEX.

Users can deposit cryptocurrencies to create a liquidity pool or add liquidity to a pool and receive liquidity provider (LP) tokens as rewards. These LP tokens reflect the user's proportionate part in the pool and may be used to withdraw their share of the liquidity at any moment.

When a user decides to exchange one token for another on an existing pool, the transaction utilizes liquidity from the pool. The trading fees earned by these trades are divided proportionally among LP token holders to their participation in the pool, making it an appealing investment prospect for individuals seeking passive income in the DeFi area.

Liquidity pools ensure that trade pairs always have enough liquidity. It helps to decrease slippage and gives traders a better trading experience.

a. How Liquidity Pools are Calculated

Riverex Liquidity Pools add liquidity to the crypto market, giving traders adequate liquidity to swap their assets at any time and location.

When a new liquidity provider deposits tokens into Riverex, the number of tokens to be minted varies depending on the liquidity pool's current worth and the number of tokens added.

Suppose a new liquidity provider adds liquidity to an existing pool; the number of tokens to be minted will be calculated as

$$Token_m = \frac{x_d}{x_b} \times Token_b$$

Where $Token_m$ is the number of new liquidity tokens; x_d is the amount of the trader's initial token added to the pool; x_b is the total amount of the token in the pool prior to the trader's addition, and $Token_b$ is the entire quantity of Liquidity Provider (LP) tokens already in circulation.

b. How Automated Market Maker Works

The price of the tokens in the pool is determined by a mathematical formula called the Automated Market Maker (AMM).

This algorithm ensures that the product of the total number of tokens in the pool is constant and that the token price varies based on supply and demand, enabling an efficient method of providing liquidity in DeFi protocols.

The three main objectives of AMM pools are

- A. Minimize pricing cost
- B. Minimize trading cost
- C. Being 100% Trustless, as a Smart Contract regulates the pool

The liquidity pool formula is $x * y = k$, where x and y are the numbers of two tokens in the pool, and k is the constant product of the two tokens. According to the formula, the product of the two quantities must always remain constant at a ratio of 1:1.

Example:

Let's say we have a liquidity pool with 100 ETH and 10,000 USDT. The constant product of these two tokens is:

$$100 \text{ ETH} * 10,000 \text{ USDT} = 100,000$$

Suppose someone wishes to purchase 2 ETH from the pool using USDT. The new amount of ETH in the pool, according to the AMM formula, will be:

$$100,000 / 10 = 10,000$$

$$1 \text{ ETH} = 1,250 \text{ USDT} (10,000/8)$$

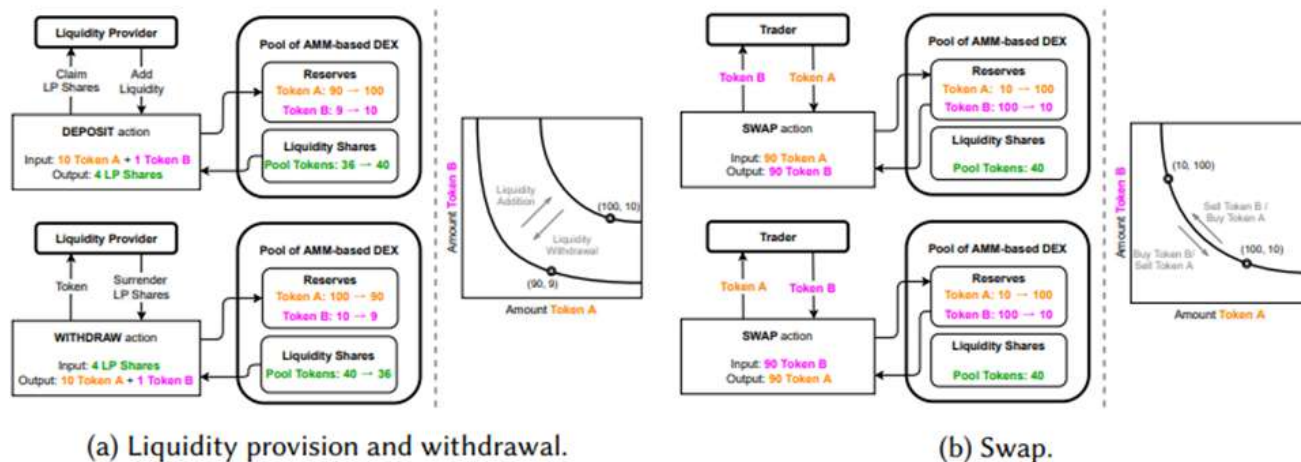
$$2 \text{ ETH} = 2,500 \text{ USDT}$$

Hence, if someone wants to buy 2 ETH, they must add about 2,500 USDT to the liquidity pool to keep the value of k constant.

As a result, the new amount of ETH in the pool is 8 ETH, and the new amount of USDT is 12,500 USDT.

c. Liquidity Provision, Withdrawal, and Swap Process

Based on the two formulas, the liquidity provision on Riverex follows the below process.



d. Customizable Liquidity Provider Fees

Riverex provides users control over their earnings by utilizing its customizable liquidity pool fees.

This is beneficial during challenging markets as it permits greater flexibility and potentially higher earnings.

Users can modify their transaction techniques to better meet their requirements and objectives by selecting their own liquidity fees from 0% - 10%.

❖ **Liquidity Pool Fee Calculation**

The Riverex liquidity pool model enables the creation of multiple pools with different fees for liquidity providers along with the protocol fee.

When creating a pool, users can customize the Liquidity Provider Fee (LPF) from 0% to 10%, where Riverex's default fee is 0.25%. On top of this, users are charged a 0.05% fixed protocol fee for swapping non-utility tokens from the platform.

Using the LPF default fee, the overall transaction fee is 0.30%, where 5/6 depends on liquidity provider fees and 1/6 portion is associated with the fixed protocol fee.

To implement the fee contract, Riverex modifies and adapts the mapping formula that holds all created pools from the PoolFactory,

where a pool should be recognized by Token1, Token 2, and the overall fee.

Thereby, the function will be:

```
mapping(address => mapping(address => mapping(uint32  
=> address))) public override getPair;
```

❖ **ERC20 Pair Formula**

The `ERC20Pair` is the contract representing the liquidity pool for a specific ERC20 token pair.

The initial function called from the `PoolFactory` contract is where the liquidity pool is triggered with specific parameters, like the token pair, the trading fee, and the protocol fee.

```
ERC20Pair(pair).initialize(token0, token1, fee,  
protocolFee);
```

❖ **Liquidity Minting Calculation**

Following the standard AMM model to calculate the amount of liquidity to be minted, the function is:

```
uint denominator = rootK.mul(5).add(rootKLast);
```

However, Riverex modified the formula to correspond to its unique feature of customizing liquidity provider fees.

Hence, the modified function for Riverex is as below:

```
uint256 denominator = rootK * ((feeNumerator /  
protocolFee) - 1) + rootKLast;
```

Where:

- ❖ `feeNumerator` = is the overall fee (*Riverex protocol fee [utility or non-utility] + liquidity provider fee [customizable from 0-10%]*)
- ❖ `protocolFee` = is the protocol fee *[utility or non-utility]*
- ❖ `rootK` = is the current K
- ❖ `rootKLast` = is the last K from the last price update

- ★ Subsequent to the standard AMM model, with a `feeNumerator` value of 300 and `protocolFee` of 50, the modified formula is as follows:

`uint256 denominator = rootK * ((300 / 50) - 1) + rootKLast;`

`uint256 denominator = rootK * (6 - 1) + rootKLast;`

`uint256 denominator = rootK * 5 + rootKLast;`

With this denominator, the standard AMM model minting formula is:

$$S_m = \frac{\sqrt{k_2} - \sqrt{k_1}}{\left(\frac{1}{\phi} - 1\right) \cdot \sqrt{k_2} + \sqrt{k_1}} \cdot S_1$$

Where:

- k_1 = is the value of the previous k
- k_2 = is the value of the current k
- S_1 = is the total pool supply
- ϕ = is the ratio of overall fees and protocol fees (1% following standard model)

Following the above formula, the assumptions are as follows:

$$\phi = \frac{x}{y}$$

Where:

- x = is the protocol fee
- y = is the overall fee

Therefore since Riverex has dynamic liquidity provider fees and protocol fees, the formula for calculating the amount of liquidity to be minted is as follows.

$$S_m = \frac{\sqrt{k_2} - \sqrt{k_1}}{\sqrt{k_2} \left(\frac{y}{x} - 1\right) + \sqrt{k_1}} * S_1$$

Where:

- S_m = is the amount of liquidity to be minted
- k_1 = is the value of the previous k
- k_2 = is the value of the current k
- S_1 = is the total pool supply
- x = is the protocol fee
(Riverex utility protocol fee: 0.03%; non-utility protocol fee: 0.05%)
- y = is the overall fee
(Riverex protocol fee [utility or non-utility] + liquidity provider fee [customizable from 0-10%])

e. Slippage Tolerance

Slippage is the difference between the expected price of a trade and the actual price at which the deal is executed, expressed as a percentage of the expected price.

Various variables, including market volatility, poor liquidity, and order size, can cause this variation.

Hence, if a user expects to trade 1 Bitcoin for \$20,500 but ends up getting \$20,000 owing to slippage, the slippage % is determined as follows:

$$\text{Slippage} = \frac{(E_p - A_p)}{E_p}$$

Where E_p or Expected price is the price at which the user wanted to make the transaction based on the asset's current market, and A_p or Actual price is the price at which the transaction was executed after adjusting the price impact caused by the order.

$$\text{Slippage} = \frac{\$20,500 - \$20,000}{\$20,500} = 0.02 \text{ or } 2\%$$

Therefore, in this situation, the slippage tolerance is 2%, which means that the trader lost 2% of the expected price through slippage.

The slippage tolerance in the Riverex platform is set at 0.03% by default. Users may, however, change the percentage of slippage from 0 to 100%, depending on how much they are ready to accept.

f. Divergence/Impermanent Loss

An impermanent loss is a difference between the LP's original deposit value and its value at the time of withdrawal. It occurs when the price of assets in a pool changes, causing the shares to be less valuable than the current value of the deposit.

It is temporary since the loss may be recovered if the token pair returns to its initial exchange rate.

Assume an LP contributes equal quantities of two assets to a liquidity pool: Asset A is priced at \$1, and Asset B is priced at \$2.

If the price of A rises to \$2 and the price of B decreases to \$1, the LP's portion of the pool will be tilted toward A since the pool now includes more portion of A than B.

When the LP withdraws the funds, they will receive more A than they supplied but less B than they initially provided.

The loss is only temporary until the LP withdraws its assets from the pool at the revised price.

5.) WalletConnect Integration

WalletConnect ensures the highest levels of security and privacy while providing a smooth and user-friendly experience for browsing decentralized exchanges using a digital wallet.

Riverex integrates WalletConnect to allow users to access a variety of dApps directly from their digital wallets without having to transfer their funds or input private keys.

Thus, users benefit from the ease and accessibility of utilizing different dApps while maintaining control over their funds, lowering the dangers of phishing scams and other security hazards that are prevalent in the DeFi industry.

At present, Riverex supports a multitude of digital wallets, including MetaMask, Coinbase, WalletConnect, and TronLink Wallet for the web application. On the other hand, the mobile application supports MetaMask and TrustWallet.

6.) Import Custom Token

Most DEXs only accept several tokens by default. However, with Riverex, users can add or import any token into the platform, providing users autonomy and access to a broader range of tokens, enabling them to diversify their portfolios.

The import token facility opens up new opportunities and options for users interested in emerging projects that are not yet listed on more prominent exchanges.

7.) Dashboard and Analytics

Dashboard and analytics provide users with greater transparency and security by offering real-time information and insights that help users make more successful transaction decisions.

Riverex dashboard and analytics on both liquidity pools and peer-to-peer pages give users up-to-date details on the status of their transactions, volume trades, transaction lists, and top pools and tokens.

Additionally, Riverex's analytical tools assist users in spotting market trends and patterns so they can choose their transaction methods with more knowledge.

8.) Affiliate Program

Riverex Affiliate Program helps users by allowing them to earn commissions by advertising the platform's features and services.

Users can promote the platform through friends, families, and social media channels.

Once the referred user completes a P2P swap transaction, creates a liquidity pool, adds liquidity to a pool, or swaps assets from an existing pool, both the referrer and referred users receive WELLE tokens as rewards.

IV. Riverex Utility Token

WELLE is the utility token of Riverex that uses the ERC-20 standard and powers the products and services accessible on the platform.

With WELLE tokens, users will have lower transaction costs and access to the platform's unique features. Users can also exchange utility tokens for different stablecoins and altcoins supported by the platform.

There are 30 billion WELLE tokens minted on three supported networks: 10 million WELLE tokens each on Ethereum, Binance, and MoonBeam.

A. WELLE Features

1.) Multi-blockchain Fungibility

WELLE is supported through three blockchains under the Riverex platform: Ethereum, Binance, and Moonbeam.

Due to the platform's decentralization, a smart contract mechanism allows the token to cross-chain between multiple blockchains.

2.) Multi-crypto Support

Riverex supports over 270 tokens that provide seamless transactions, granting greater flexibility, ease of use, and accessibility to transact within a single platform.

B. Uses of WELLE

Riverex users can use WELLE in the following features/applications:

- Platform Fees
- Affiliate Program Rewards
- Trading
- Staking (*Upcoming*)
- Bridging (*Upcoming*)
- NFT Swapping

C. WELLE Contract Address

Network	Contract Address	Explorer Link
Ethereum	0x1376a81fe3eE7D0e431f1Ac24286b00f3CCf44e7	https://etherscan.io/address/0x1376a81fe3eE7D0e431f1Ac24286b00f3CCf44e7
Binance	0x71Cb7EF7980C44dFbbE5744973C0587764116d26	https://www.bscscan.com/address/0x71cb7ef7980c44dfbbe5744973c0587764116d26
MoonBeam	0x8389cf5BE8f1e56211D226668A8B8f6cADE61Ee4	https://moonscan.io/token/0x8389cf5be8f1e56211d226668a8b8f6cade61ee4

V. RoadMap



VI. References

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