QRDO TOKENOLOGY

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QREDO

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SETTING THE STAGE FOR A **NEW TOKENOLOGY**

Just two years ago, when Qredo published its white paper, the industry was predominantly characterized by highly segregated and centralized platforms, many of which were suffering from perennial security issues such as theft, fraud or human error. Traders also encountered additional challenges such as inefficient collateral allocation, network congestion, delayed settlements and increased trading costs – many of which continue to this day.

Despite the continued dominance of centralized entities in the market, recent events such as the November 2022 collapse of FTX and resulting industry contagion underscore that the demand for more transparent alternatives that no longer rely on centralized intermediaries remains strong.

Unsurprisingly, DeFi's Total Value Locked (TVL) has remained stable even during the bear market, showcasing an astounding 6,900% increase since 2020. In May 2023, a new DeFi volume record was achieved, with 18% of the total spot volume traded on DEXes. Moreover, traders continue to display a keen interest in leveraged trading, driving the emergence of more DeFi protocols specializing in derivatives

The immense potential of DeFi to eliminate untrustworthy intermediaries has fueled its growth and captured the attention of investors, developers, and users worldwide. As the safest entry point into DeFi, Qredo aims to unlock new possibilities for organizations and individuals to access DeFi products and services in a more efficient, interoperable and secure manner.

To that end, we have been actively developing and evolving the Qredo Application to give industry participants the best possible DeFi experience. Our Web3 Wallets give traders secure access to hundreds of decentralized applications (dApps) across the vast landscape of EVM blockchains; our Web3 API gives traders programmatic access to DeFi without compromising security or speed; and our Clear Vault solution automates Layer 2 collateral and trade settlements, providing traders with a seamless and secure self-custodial environment to access markets.

As we continue to develop new features and expand the functionality of the Qredo Application, our long-term objective over the coming years is to also continue evolving the Qredo Protocol. As we see it, most blockchain protocols and dApps still require some degree of trust – either in the integrity of the code, the semantics of the smart contract, or the architecture of the application. There is room for further innovation in this most foundational blockchain principle. At Qredo, we intend to realize the full potential of blockchain by fully engineering away trust from all aspects of the Qredo Protocol.

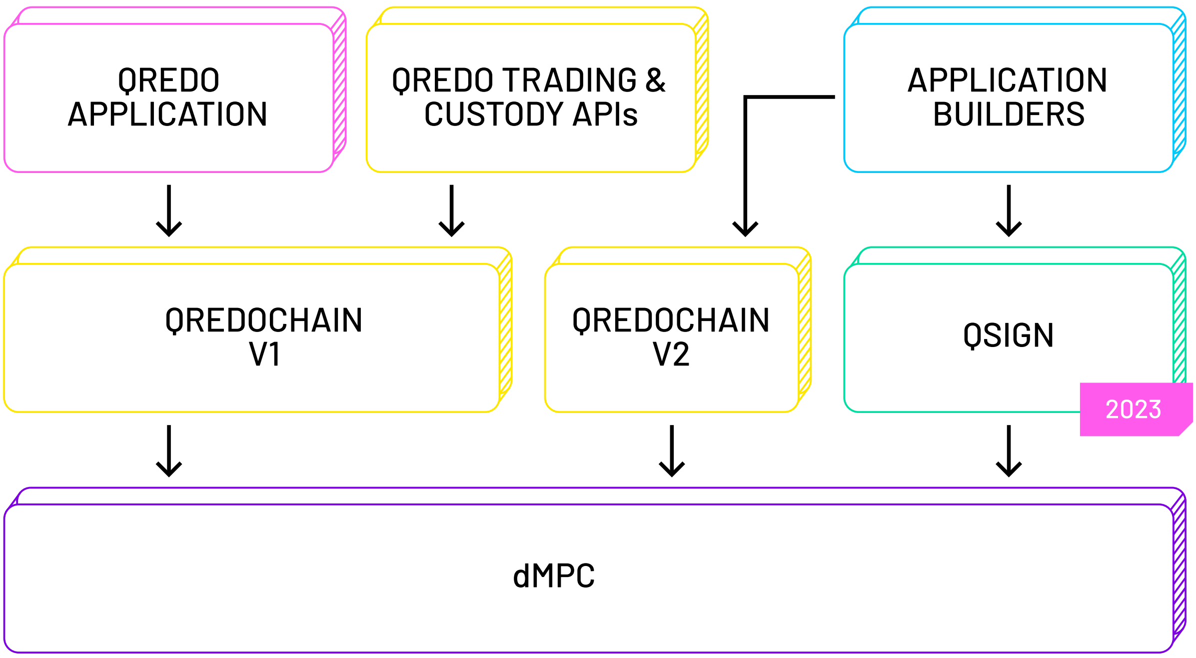
At the heart of this breakthrough lies a Cosmos-based evolution of the Qredo blockchain paired with a zero knowledge (ZK) ledger that can prove the validity of its state to any third party that can verify a zero knowledge proof – in essence, a "universal ZK-rollup". This future evolution of Qredo will enable any existing dApp to be fully interoperable across blockchains leveraging this universal ZK-rollup paired with Qredo's L2, but crucially, without any trust in third parties. dApps can be built to be verifiably trustless. Builders will be able to use Qredo to deploy cross-chain collateral, unlock cross-chain liquidity via AMMs, and launch verifiably trustless bridges. With the impending tokenization of real world assets and financial products, Qredo will power the interoperability and security needed to make this a reality.

THROUGH THE CONCERTED EFFORTS OF QREDO LABS, OUR INNOVATION ARM, WE ARE LAYING THE FOUNDATION FOR A ZERO-TRUST WORLD WHERE VERIFIABLE MATH GOVERNS EVERY ASPECT OF THE PROTOCOL.

THIS LONG TERM OBJECTIVE IS A PIVOTAL DRIVER IN THE RECONFIGURATION OF OUR NEW TOKENOLOGY FRAMEWORK, WITH THE QRDO TOKEN AT THE HEART OF THE EXPANDING QREDO ECOSYSTEM.

ECOSYSTEM

Qredo boasts a sophisticated multilayer architecture comprising two key components: the Qredo Protocol and a distributed, consensus-driven multi-party computation (MPC) network. This versatile structure is designed to act as the security primitive for a wide array of use cases – from powering enterprise custody applications, through to securing cross-chain interactions – all of which contribute to the overall advancement and usage of the Qredo ecosystem. Our new tokenology proposal aims to establish a robust and user-friendly framework, with QRDO serving as the native protocol token that seamlessly connects all modular elements within the Qredo ecosystem.



ARCHITECTURE

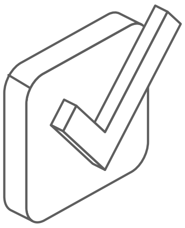
Qredo Protocol acts as an asset registry, recording the ownership of L1 assets on Qredo's L2 blockchain, with all signatures secured by a distributed MPC (dMPC) network. The majority of Qredo users engage with the protocol via the Qredo Application; however, it is essential to note that Qredo Application is just one of several methods for accessing the Qredo Protocol. For high-frequency DeFi trading, or for builders that wish to expose Qredo's key management and wallet solutions within their own applications, API access provides the most robust support.

Additionally, Qredo's cross-chain interoperability solution, Qsign, will enable direct communication between its smart contract and the dMPC network.

Given the distinct nature of these various use cases, each demands a unique market approach. Consequently, instead of targeting specific use cases, our new tokenology cuts directly to the core of the protocol: incentivizing validators and stakers to uphold the network's security and rewarding early adopters.

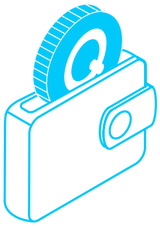
STAKEHOLDERS

There are five main stakeholder groups within Qredo's economy:



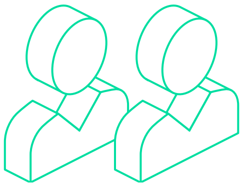
VALIDATORS

Validators are the "workers" of the economy. They are responsible for running the decentralized custody network and executing transaction requests. This group includes MPC nodes and validator nodes.



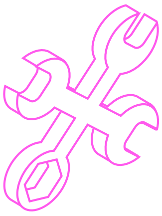
STAKERS

Stakers are the "external investors" of the economy. They bring capital from the outside to buy the native token (QRDO) and use it to support validator operations, increasing security and confidence in the protocol.



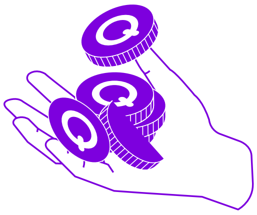
USERS

Users are the "outside buyers" of the economy. They bring capital and spend it in the economy by buying the services offered by Qredo.



DEVELOPERS

Developers are the "builders" of the economy. They are responsible for maintaining the protocol's core systems, as well as creating new applications to improve and diversify services within the economy, thereby attracting more users to the network.



TOKEN HOLDERS

Token holders are the "voters" in the economy. They hold a piece of the economy by buying and holding QRDO. Holding the protocol's native token will give them specific access to discussions and decision-making power.

By placing QRDO at the heart of the ecosystem, we align Qredo's stakeholders with the growth of the network.

UTILITY

Looking forward, the Qredo Network will evolve across three axes:

1. Increased decentralization through Delegated proof-of-stake
2. Enhanced QRDO utility
3. Improved transparency and community engagement through open governance

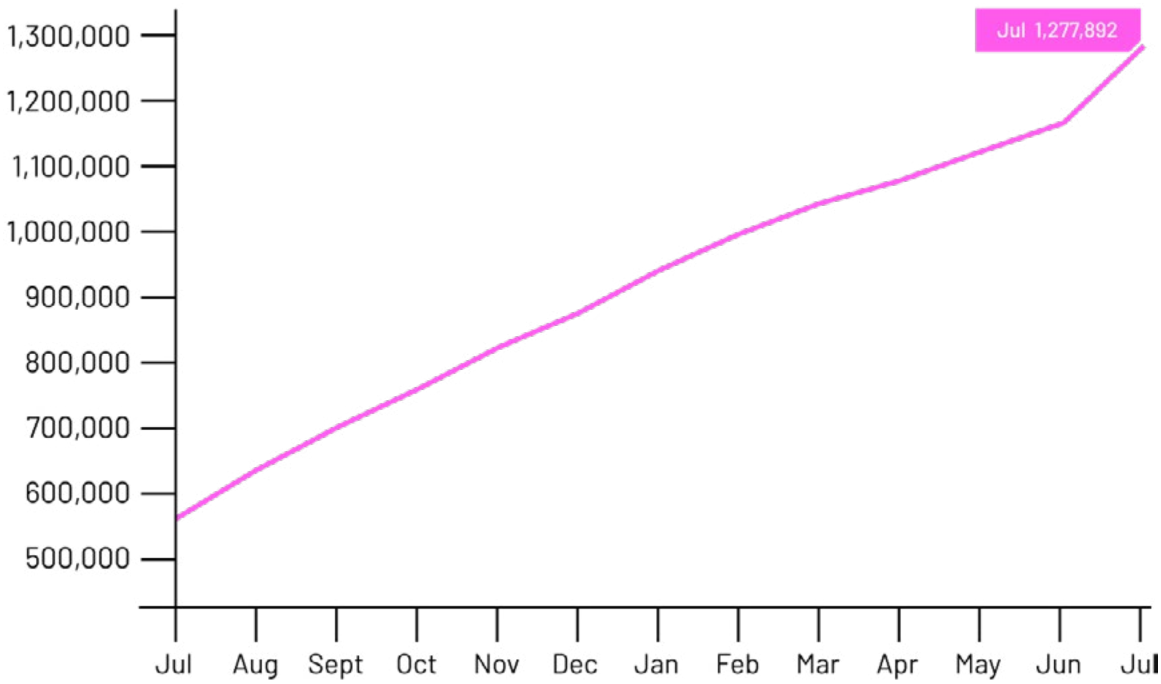
The utility of the token is demonstrated in its many use cases within the Qredo ecosystem:

Feature	Usage in Qredo	Right/Benefit	Right/Benefit
Staking	Tokens are locked to secure the protocol and enable the Federated proof-of-stake consensus model. Rewards are distributed in QRDO.	Receive a share of rewards and fees.	Stakers, Validators
Work	Validators run the protocol by validating transactions and receive rewards.	Receive a share of rewards and fees, and make protocol requests.	Validators
Governance	QRDO is used to vote on Qredo protocol improvement proposals (QPIPs). More tokens equals more voting power.	Participate in the decision-making process of the protocol.	Token holders
Payment	QRDO is used to pay protocol fees and service fees.	Use Qredo services and make protocol requests.	Users
Reward	Airdrops of QRDO and quests from a dedicated fund are used to incentivize participation and adoption of product features.	Access Qredo services at a discount.	All
Funding	QRDO is awarded to key contributors.	Share in the success and value of the network	Developers

ECONOMICS

Qredo generates revenue through transaction fees. Qredochain serves as the ledger for recording changes in asset ownership and governance policies, with a primary focus on securing signatures. The value generated by the network increases with higher levels of network activity and the volume of transactions deployed. Since its launch, Qredo has recorded over 1,250,000 transactions on Qredochain and secured over **$45 billion transactional volume, highlighting the platform's growing ecosystem.**

NETWORK TRANSACTION Cumulative

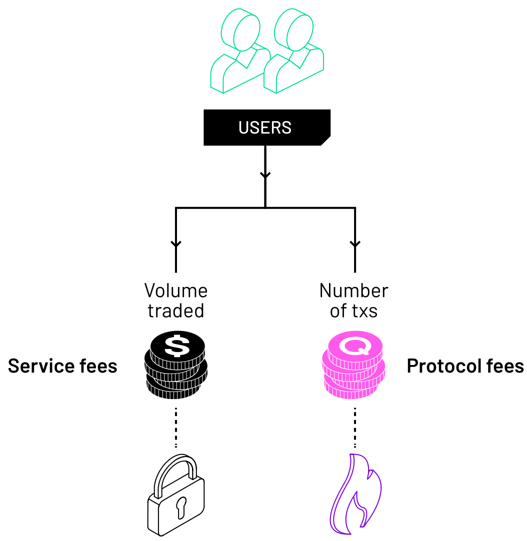


FEES

Qredo will introduce a two-level fee structure, comprising a **Protocol Fee** and a **Service Fee.**

Protocol fees – fees imposed when submitting requests to the Qredo Protocol, serving as a safeguard against potential spamming attacks.

Service fees – fees computed in a pay-as-you-go model based on the total volume transacted in billable operations via the Qredo Application.



The adoption of this dual configuration enables Qredo to offer a competitive fee structure while also ensuring the security and integrity of the network.

PROTOCOL FEES

Today, around 80% of the transactions on Qredochain are classified as non-billable, encompassing various essential activities such as L2 transfers, deposits, dMPC signatures, new agent creation, and policy updates. However, as Qredo progressively expands its network access, the prevalence of fee-free transactions raises concerns about potential vulnerability to spamming attacks. In response to this risk, a protocol fee for all the aforementioned transactions will be introduced to bolster the network's security.

Currently, all transaction types involve similar computation costs. Therefore, Qredo has opted for a **flat fixed protocol fee of 2 QRDO for all transactions.** This approach ensures that the total protocol fees collected will scale linearly with the number of transactions processed by the network. Notably, all protocol fees collected **will be "burned," on a weekly basis** removing them permanently from circulation.

The act of burning fees creates a level-playing field for all users who wish to utilize Qredo's L2, as the net costs of submitting a request remain the same for all users, including validators.

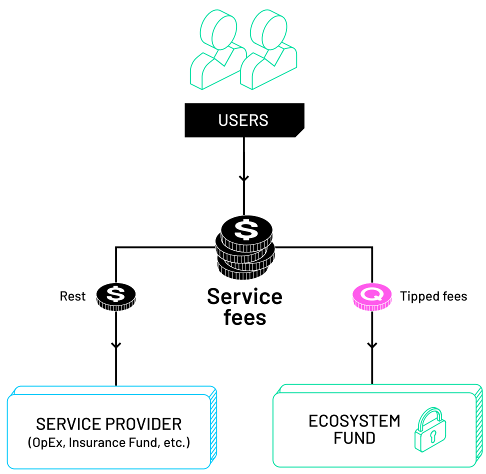
Protocol fees will always be charged in QRDO, creating a new utility feature and a demand driver for the token.

SERVICE FEES

Currently, the network utilizes a *"pay-as-you-go"* fee model, in which fees are applied to certain outgoing transactions – namely, these billable transactions are withdrawals and smart contract calls. The service fee for each user is computed using a pricing curve which reduces the price per transaction as the total traded volume over a trailing 30 day period increases. Every month, a minimum of 30% of the total Service Fees collected will be tipped back to the network.

As the Qredo Protocol can be used to interact with different tokens and blockchains, the estimation of transaction volume relies on a pricing feed from an oracle. Since the traded volume is denominated in USD, the corresponding fees are also quoted in USD. To enhance platform usability, especially for institutional users seeking simplified accounting processes, the option to pay service fees in stablecoins is a crucial product feature. To support a diversified pricing strategy tailored to users' needs, service fees are charged on the application level.

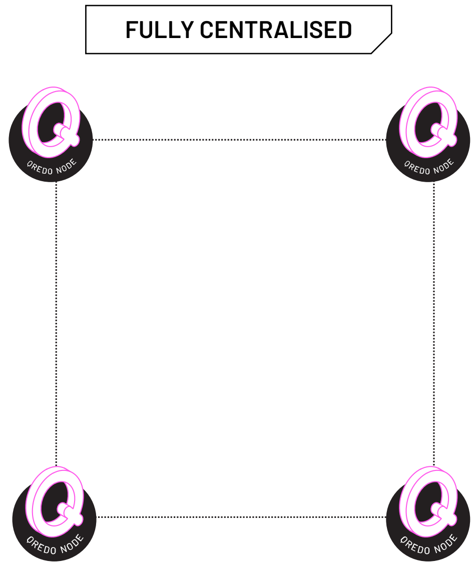
When fees are paid in QRDO, they are directly tipped into the Ecosystem Fund, which distributes rewards among network participants. However, if fees are paid in stablecoins, they will first be used to purchase QRDO before being tipped into the Ecosystem Fund. Once fees are tipped to the Ecosystem Fund, they get locked and distributed according to a release rate function.



To incentivize QRDO payments, fees paid in QRDO enjoy a 15% discount. Furthermore, to promote QRDO adoption as a preferred payment method, Qredo will introduce a minimum 30-day total traded volume benchmark that must be met in order for users to become eligible to pay their fees using stablecoins.

STAKING MODEL

Qredo's long-term vision is to implement a Delegated Proof of Stake (DPoS) consensus model. However, to facilitate a smooth transition to DPoS, the network will initially implement Federated Proof of Stake (FPoS). The primary distinction between the two lies in the staking. In FPoS, stakers contribute to a single staking pool distributed among validators who have been preselected by Qredo based on technical skill and experience running validator nodes. All FPoS validators possess equal consensus power and stakers do not delegate their tokens to individual validators. This approach to consensus allows for enhanced testing to critically ensure that security and latency are not compromised in preparation for the transition to DPoS.

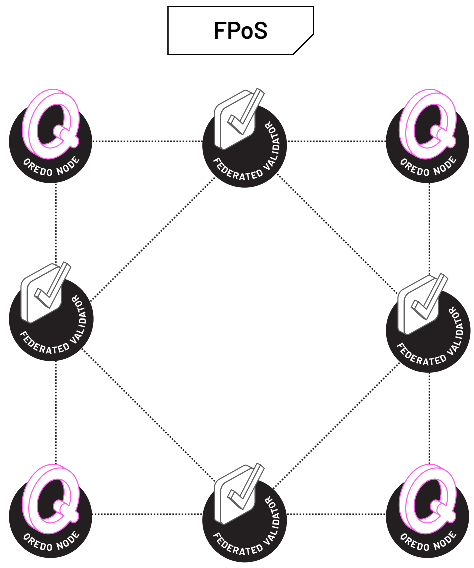


FEDERATED PROOF OF STAKE

Synthetic staking will no longer be supported in the FPoS model. Users must delegate their tokens to a staking pool by transferring their QRDO tokens to an individual Staking Vault governed through the Qredo Station.

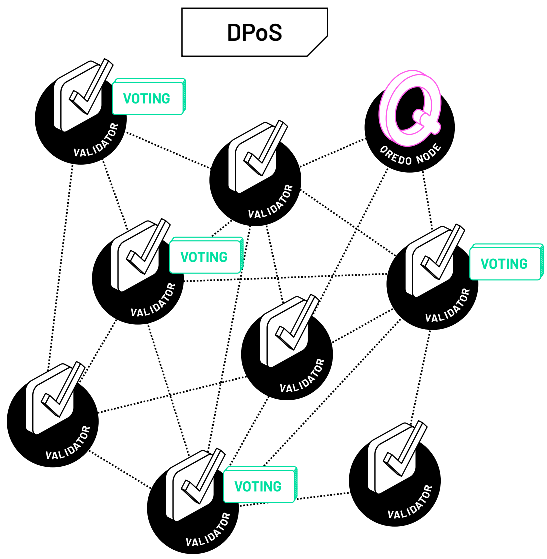
Once tokens are staked, they are locked and start earning staking rewards. Locking is an essential part of any consensus mechanism derived from proof-of-stake. In particular, it enhances network security while simultaneously lowering circulating supply. To unlock tokens and end staking, users will have to unbond their tokens first.

The unbonding period on Qredo will be **three complete reward cycles**; during this time, no rewards will be paid. When the unbonding time has passed, users can have access to move or sell their tokens.



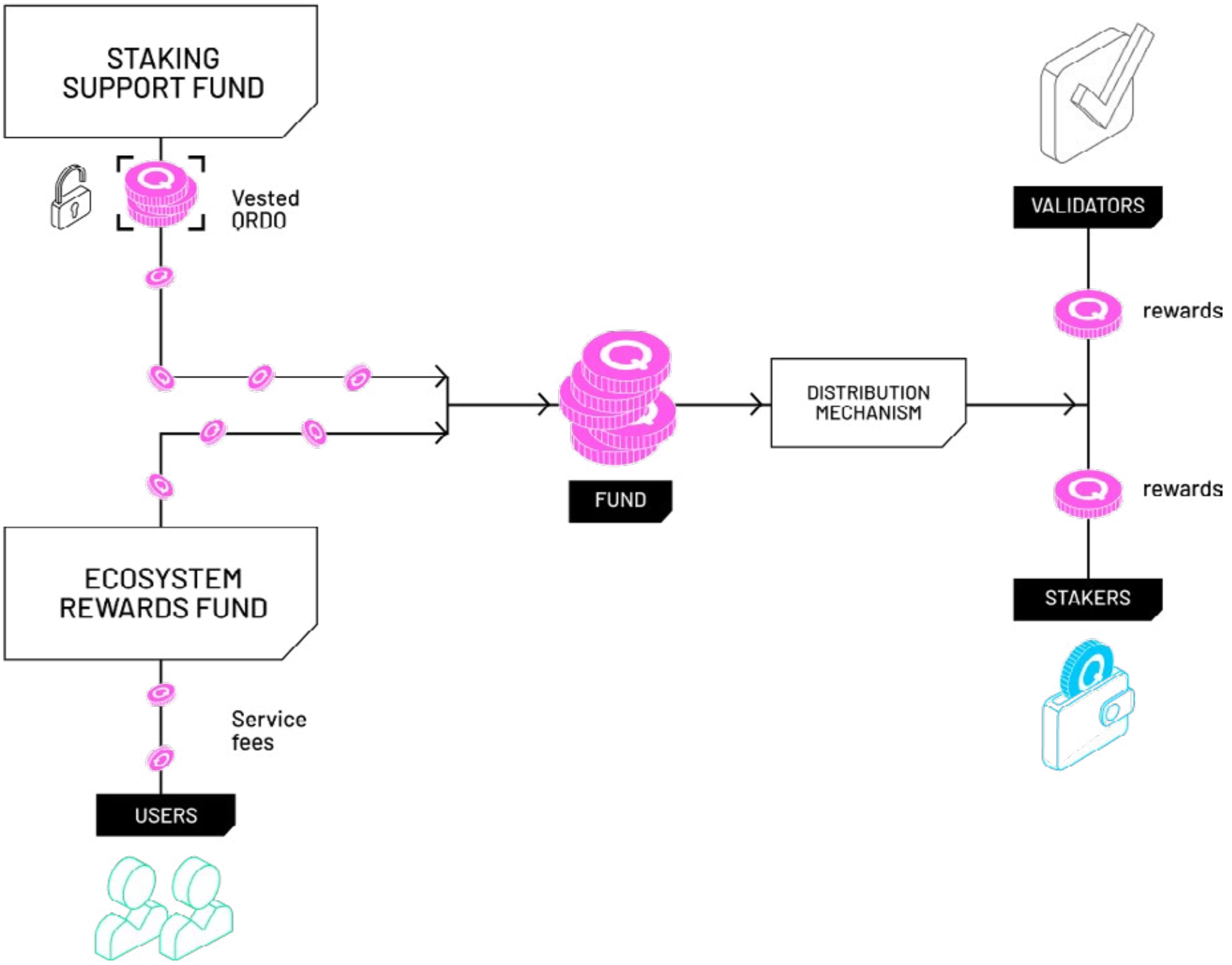
Staking rewards and validator commission are released every epoch/~12h and are paid weekly, and a reward cycle is a whole calendar week. To be eligible, users have to stake a minimum **2,500 QRDO**.

The minimum staking amount to be considered for inclusion in Qredo's FPoS validator network is **2,000,000 QRDO**.



REWARDS

In order to incentivize network expansion and hit key performance indicators such as the target Total Value Locked (TVL) and the target number of validator nodes, the staking model rewards will incorporate two token inflow mechanisms – an **Ecosystem Fund** and a **Staking Support Fund** – that will produce more substantial rewards as the network attains these specific growth milestones.



The **Ecosystem Fund**, will have a key role in the Qredo economy. It will serve as **the primary repository for service fees tipped into the network** and it will also control how staking rewards are released. The release rate will be contingent on Qredo's performance and growth, ensuring alignment with the network's long-term sustainability. As part of Qredo's commitment to decentralization, the Ecosystem Fund will receive the largest token allocation within the ecosystem.

The long-term balance of the Ecosystem Fund is influenced by token price, usage, and staking sentiment. Lower token prices and higher network usage lead to more tokens being locked in the Ecosystem Fund. It is estimated that in three years, the locked and unlocked token flows from the Ecosystem Fund could balance out. This balance will mark a transition from an inflationary to a deflationary model, as new tokens will no longer enter the market. The fund's balance will remain stable and locked, reducing the total circulating supply. It will also serve as an insurance fund, ensuring the staking model's sustainability if tipped fees fall below the released rewards.

The **Staking Support Fund** is a newly established fund designed to bolster FPoS. Its primary objective is to provide a reliable and predictable source of rewards, specifically to support the initial stages of decentralization efforts.

REWARD FUNDING

The Ecosystem Fund release rate function (r) controls the number of tokens available for distribution from the ecosystem fund. This rate takes into account two of Qredo's KPIs for network growth: TVL and the number of validators. As either the TVL or the number of validators approaches their target, the release rate approaches the maximum possible rate.

$$r(N^{\mathrm{val}}, \mathrm{TVL}) = r_{\max}\left(b \cdot \min\left(1, \frac{\mathrm{TVL}}{\mathrm{TVL}_{\mathrm{target}}}\right)^{a} + (1-b)\min\left(1, \frac{N^{\mathrm{val}}}{N^{\mathrm{val}}_{\mathrm{target}}}\right)^{a}\right), \quad a \in \mathbb{R}_{>0},\ b \in (0,1)$$

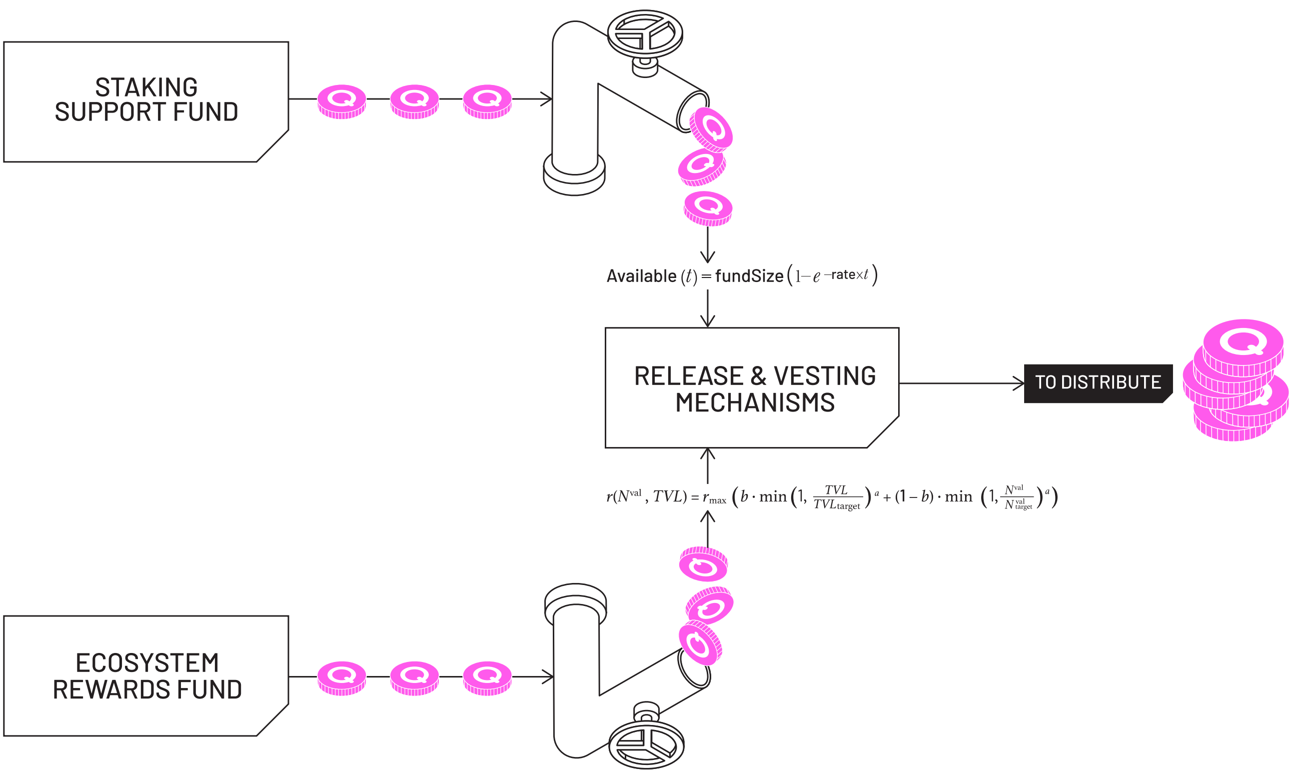
In the equation above, α is a parameter that controls the growth towards the corresponding parameter, and β is understood as a lever that gives preference to either TVL or the number of validators.

- **The maximum rate**, denoted as r_{max}, plays a crucial role in regulating the depletion rate of the Ecosystem Fund. To strike a balance between profitability and sustainability, the maximum **daily distribution rate is fixed at 0.0006**. This determines that the Ecosystem Fund will be at most halved in three years.
- **Exponent α controls** how much to reward early adopters. When α =1, the release rate increases proportionally to the number of validators and TVL. At lower values of TVL or validator count, lower α increases the release rates. To incentivise our early adopters, **exponent α is set at 0.8**, making the function supralinear.
- Our target TVL ratio is 70%, and, in this current phase of Qredo's evolution, the target number of validator nodes is 50. TVL and the number of validator nodes have equal weight with β set at 0.5.

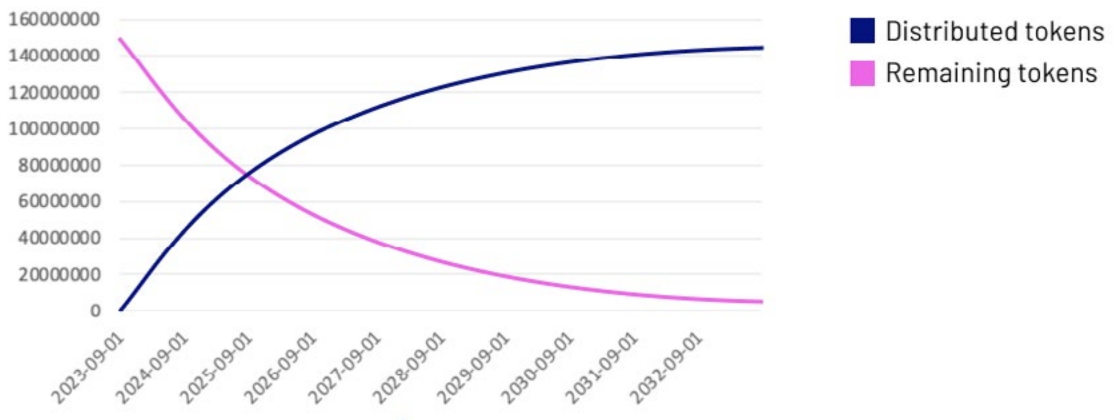
Instead of a linear vesting schedule, the **Staking Support Fund** will have an exponential decay vesting, similar to the minting schedules of many traditional blockchains, such as Bitcoin.

The vesting decay rate is strategically established with a two-year half-life, equivalent to = $\frac{\ln 2}{2 \text{x} 365}$ This carefully chosen rate strikes a balance between maintaining controlled inflation rates and serving as a valuable supplement to staking rewards.

Half of the Staking Support Fund reserves will be paid out as rewards in the next two years offering the highest rewards to the early stakers of QRDO.



STAKING SUPPORT FUND VESTING SCHEDULE



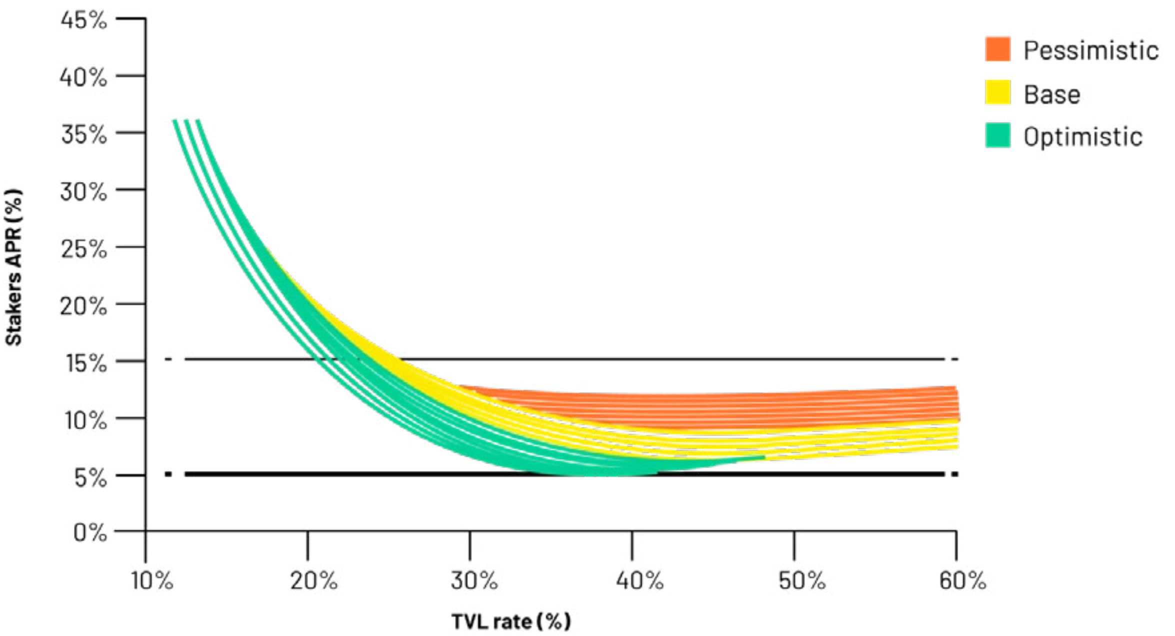
REWARD DISTRIBUTION

The new staking model has been designed to work for FPoS and DPoS, with all rewards pooled together. In FPoS, stakers delegate to the validator pool rather than individual validators. Therefore, in the transition phase from FPoS to DPoS, the validator commission is a fixed rate set by the network. Validators are eligible for 70% of the reward pool, and their share is distributed based on their performance. **Stakers are eligible for 30% of the reward pool**, and their share is distributed proportionally to the amount staked.

In the new staking model, stakers no longer receive a fixed annual percentage rate (APR). The market decides on the optimal rate. In general, higher TVL leads to lower APR and weekly rewards, which creates an incentive for early joiners to lock their tokens at the outset of FPoS implementation when TVL is low. Total available rewards do not vary proportionally to TVL. On average, stakers' APR is expected to vary between 5% to 30% depending on the staking sentiment and TVL.

In this case, APR refers to the QRDO-denominated return rate over a year, considering both the TVL and the rewards on a specific day. It's important to emphasize that these APRs do not reflect the actual rates a staker would experience over a year. Because the interest rate will fluctuate daily, the APR simply represents a "synthetic" annual rate experienced on a particular day.

TVL vs APR – OPTIMISTIC STAKING SCENARIO



This model allows us to balance security with staker profitability and provide the highest incentives for early adopters.

TOKEN DISTRIBUTION

When the QRDO token was launched, its maximum supply was set at two billion. Initially, one billion tokens were allocated, while the remaining one billion were reserved for future growth incentives. A key goal of our revised tokenology is to determine the allocation and vesting schedules for this second billion. We propose that the new QRDO token allocation be distributed in the following way:

Public Goods Fund: This fund will be used for user adoption incentive programs and partnership projects to cover initial protocol fees. The tokens will be unlocked based on sign-ups and grants approved in the governance forum.

Ecosystem Fund: This fund covers the protocol fees for protocol-subsidized transactions and acts as a repository for tipped service fees.

Staking Support Fund: This fund aims to bootstrap decentralization efforts and support the staking model by providing a predictable source of rewards.

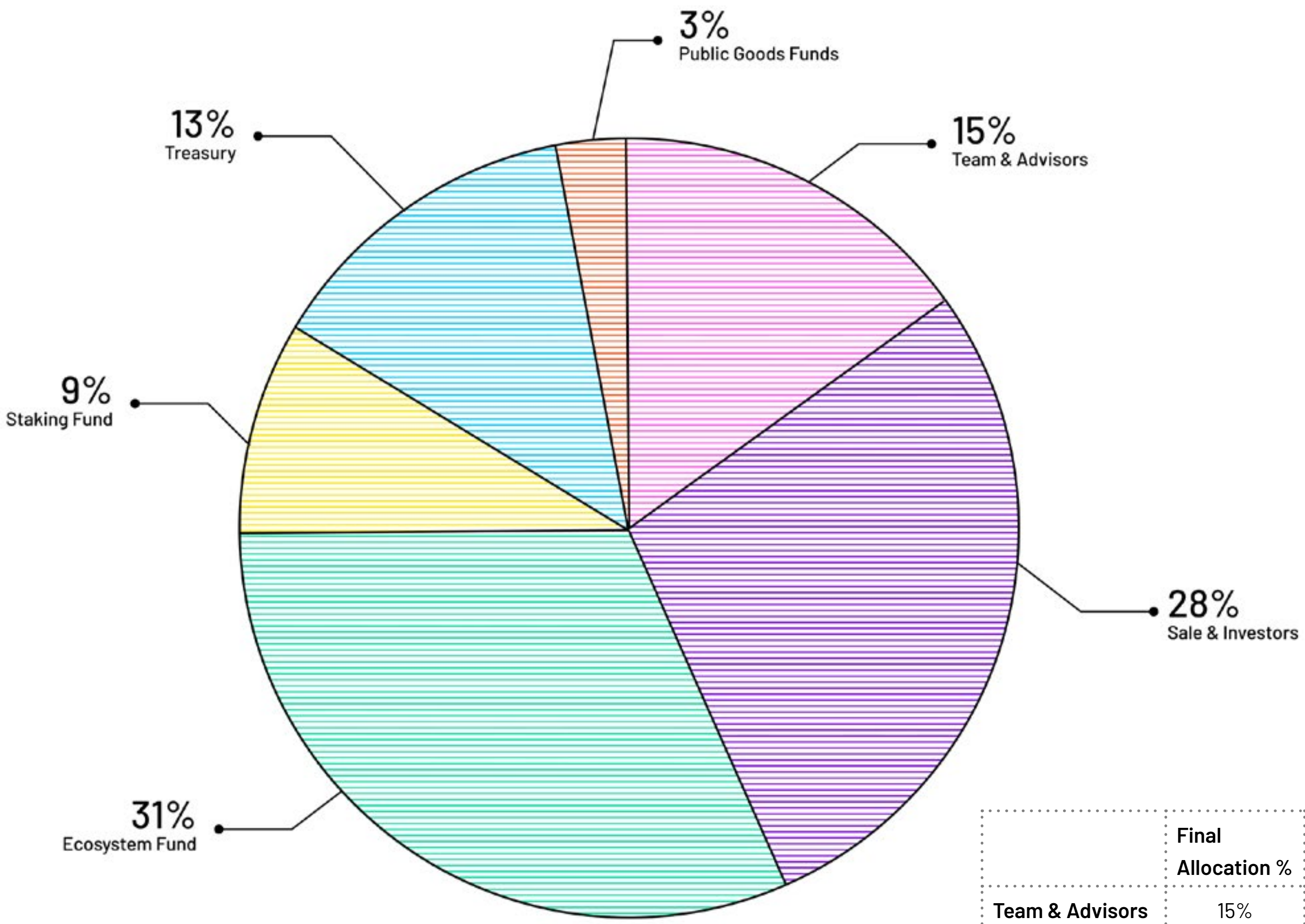
Treasury Fund: This fund is dedicated to the development and growth of the Qredo ecosystem, including the further development of Qredochain 2.0 and the commercialization of Qredo Labs' initiatives.

Burn: The purpose of the burn is to decrease the max supply and mitigate shock in the circulating supply caused by the new QRDO token allocation.

ALLOCATION

The following table summarizes the new token allocations and how they impact the overall distribution of the total two billion QRDO token supply. Table units are denominated in millions:

	Current Allocation	New Tokens	Final Allocation	Final Allocation (%)	Allocation % from TS
Burned	140	235	375	19%	-
Team & Advisors	251	0	251	13%	15%
Sale & Investors	457	0	457	23%	28%
Ecosystem Fund	110	390	500	25%	31%
Staking Fund	0	150	150	8%	9%
Treasury	42	175	217	11%	13%
Public Goods	0	50	50	3%	3%

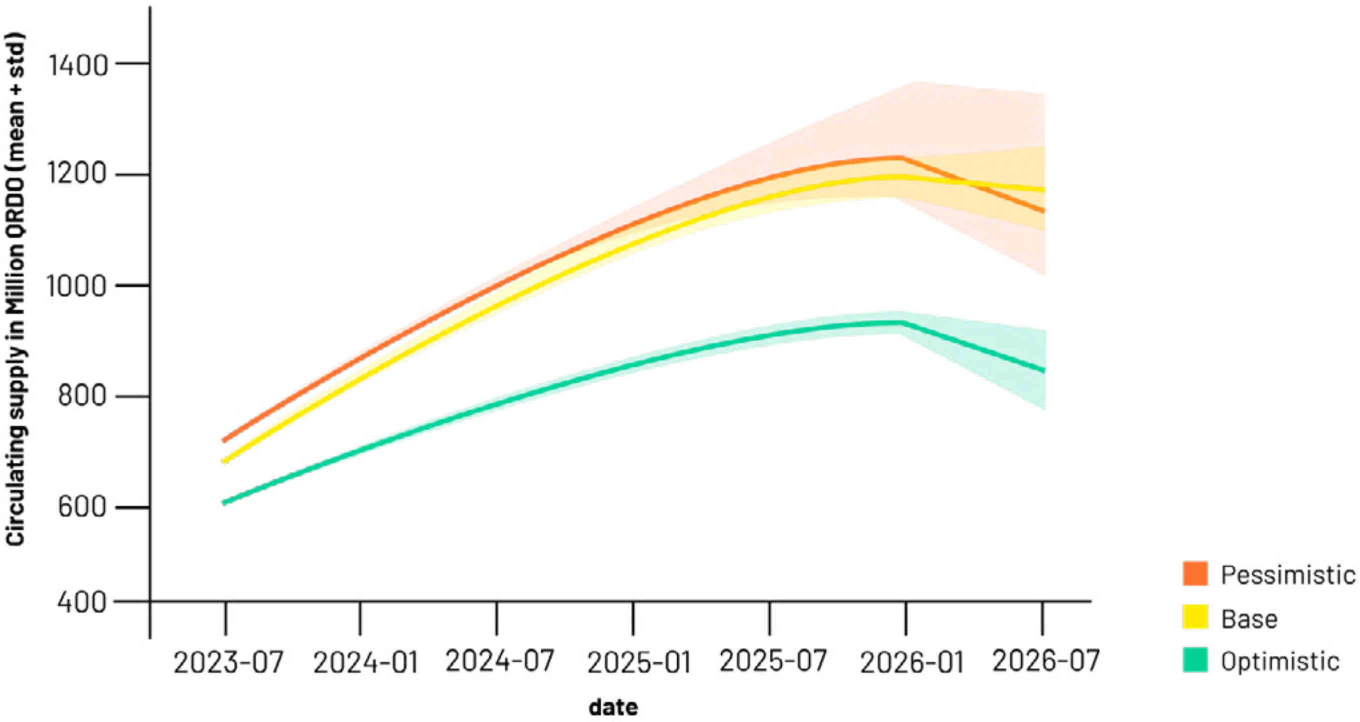


	Final Allocation %
Team & Advisors	15%
Sale & Investors	28%
Ecosystem Fund	31%
Staking Fund	9%
Treasury	13%
Public Goods	3%

VESTING

The below chart depicts how the proposed QRDO token allocation and vesting schedule may potentially impact circulating supply taking token price, network usage and staking sentiment into account post-implementation:

CIRCULATING SUPPLY FORECAST BY COMBINED SCENARIO



For the **Qredo Team and Advisors**, the allocation and vesting schedule remains unchanged.

For **Public Sale Qredo Investors**, the allocation and vesting schedule remains unchanged. Note that Private Sale Qredo Investor vesting has already concluded.

For the **Ecosystem Fund**, a proposal to expedite vesting of the remaining allocation of ~55 million tokens and allocate an additional 390 million tokens for staking rewards. Tokens in this fund will be locked and released based on the release rate function.

For the **Staking Fund**, a proposal to allocate 150 million tokens for decentralization bootstrapping. Tokens in this fund will be locked and released based on the vesting decay rate.

For the **Treasury Fund**, a proposal to expedite vesting of the remaining allocation of ~25 million tokens and an allocation of an additional 175 million tokens to fund partner programs, grants and loans to market makers and exchanges to improve QRDO liquidity in the market.

For the **Public Goods Fund**, a proposal to allocate 50 million tokens that are to be instantly vested and locked. As the fund will primarily be used for airdrops to incentivize transactions, it is expected that the majority of these fees would be used for protocol fees and will ultimately be burned.

For QRDO Token Burns, a proposal to burn 235 million QRDO tokens.

All funds will be deposited in designated vaults to ensure complete transparency. A staking dashboard will allow users to monitor the health and activity of the Qredo protocol.

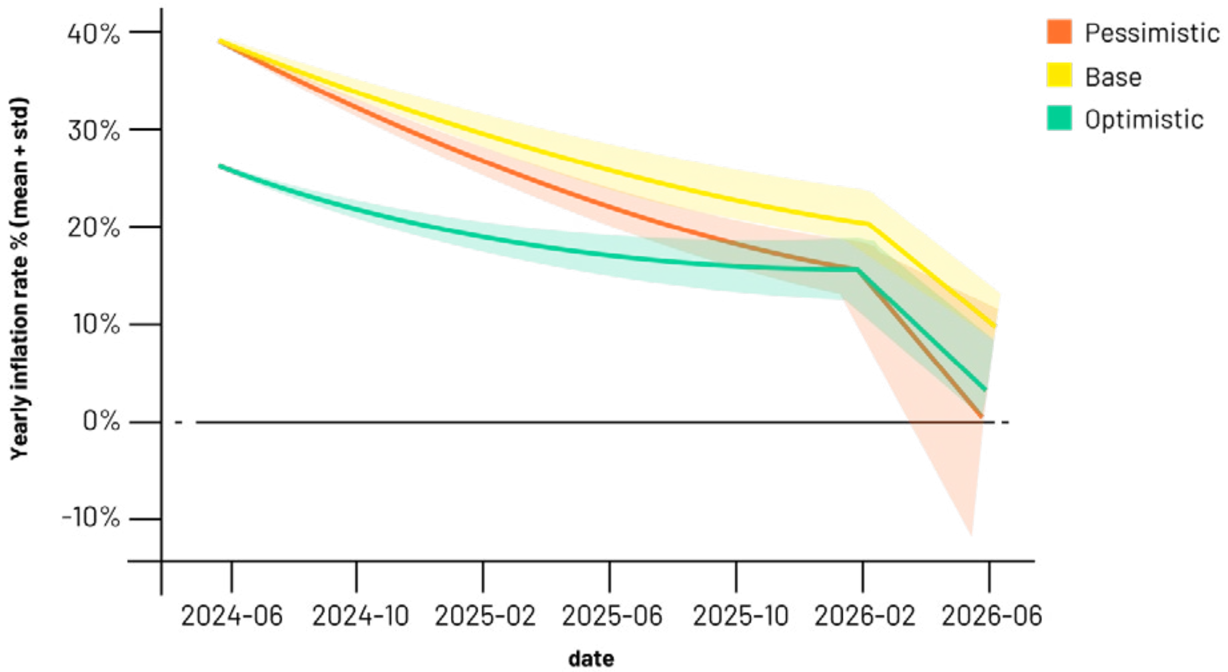
TOTAL CIRCULATING SUPPLY AND INFLATION

Due to the accelerated vesting of the remaining Treasury Fund allocation (~24M QRDO), immediate vesting of a new 125M QRDO token allocation to the Treasury Fund and 50m QRDO token allocation to the Public Goods Fund, we anticipate an increase in the circulating supply from ~388M to ~587M QRDO tokens. The distribution is planned in the first week of September 2023. The Public Goods Fund has been created to support protocol fee grants and will never enter the secondary market, as all protocol fees are burned.

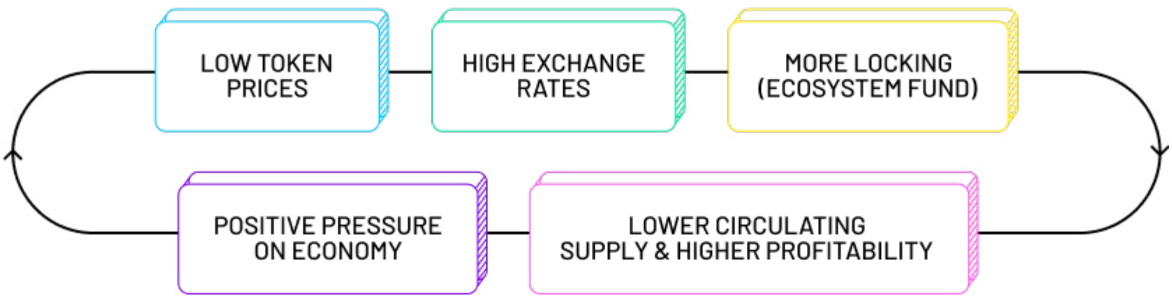
Afterward, the circulating supply will stabilize and continue to grow steadily for the next two years. The expected annual inflation during this period is projected to decrease by over 40% compared to the current tokenomics model. Supply growth rates will significantly decelerate in all scenarios at the beginning of 2026, when legacy vesting schedules will come to an end.

While this represents a significant supply shock, we believe that in the medium term it will have a positive impact on the QRDO ecosystem. The new token distribution model will help reduce uncertainty stemming from the large Total Circulating Supply (TCS) to Total Supply (TS) gap, and the market-driven staking model will boost TVL. Furthermore, both the FPoS and DPoS staking models' token lock-up requirement effectively removes tokens from the liquid circulating supply.

YEARLY INFLATION RATE FORECAST BY COMBINED SCENARIO



The new model also includes a **Price/Supply Balancing Mechanism**. During challenging economic conditions caused by low token prices, this mechanism reduces the circulating supply while simultaneously increasing the long-term pool of tokens available for the staking rewards.



Lower token prices result in a decrease in circulating supply, as more tokens are purchased and locked into the Ecosystem Fund through the service fees tipping mechanism. Increased network usage and positive staking sentiment both contribute to lower circulating supply. As more transactions are executed, additional service fees are collected and more tokens are staked, leading to more tokens being burned and locked.

DEFLATIONARY MEASURES

The new Qredo Tokenology utilizes three deflationary measures:

- Staking
- Locking
- Burning of tokens

Staking entails locking up tokens, effectively reducing the circulating supply. As an increasing number of users participate in staking and lock up their tokens, the available circulating supply decreases, potentially creating scarcity and driving upward price pressure.

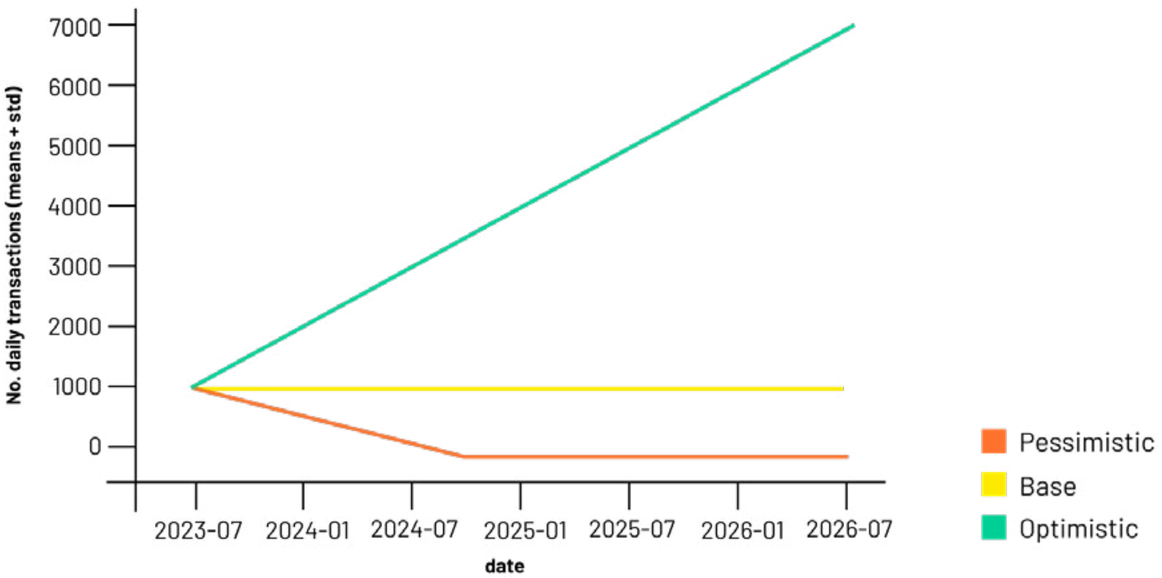
Staking on Qredo will be incentivized in three ways:

- **Rewarding stakers for securing the network.**
- **A requirement for voting in specific governance proposals.**
- **A condition to unlock advanced user features - batch transactions, etc.**

Locking plays a crucial role in the Price/Supply Balancing Mechanism, which has a deflationary impact during periods of low token prices. As more service fees are exchanged and tipped, a greater number of tokens are locked in the Ecosystem Fund, effectively removing them from circulation.

Burning of protocol fees initially will have a negligible impact on the total circulating supply. However, with the introduction of features like ClearVault and Web3 API, which facilitate high transaction velocity, we can expect the impact to grow. When tokens are burned, they are permanently removed from circulation, leading to a reduction in the total supply and contributing to deflationary pressures.

NO. DAILY TRANSACTIONS FORECAST BY USAGE SCENARIO



Expedited vesting and locking of the Ecosystem Fund will reduce the outstanding supply and eliminate the uncertainty regarding the allocation of unvested tokens. Moreover, in addition to the previous burns, further burning of 235 million tokens will result in a 19% reduction in QRDO's Total Supply (TS).

The new tokenology model places QRDO at the heart of its economy, aligning its participants with the growth of the network and enhancing its utility. The revamped staking model establishes a robust framework capable of fully capturing the value generated by the network. The reward distribution will be driven by the market, and the model's multiple deflationary measures will reduce the inflation rate.

As our network continues to grow, we anticipate this new tokenology will allow QRDO to fully capture the value created by its ecosystem.

THE NETWORK
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