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Tokenomics Review

Project: Secret Network

Initial Report Date: 15 April 2024

Final Report Date: 8 May 2024

secret network

Contents

Executive summary

This research analyzes the current state of SCRT tokenomics to understand existing issues with token design and create improvement proposals that will be discussed with the Secret Network community.

The report describes our analysis process and reveals key findings. Findings provide additional information that will help Secret Network governance in decision-making processes.

The SCRT token has three utilities: governance, staking, and transaction fees. Discovering new utilities or mechanics is out of the scope of the current project.

Key findings are:

- Inflation is capped at 9% after a reduction
- No minimum commission rate for validators
- Fixed gas prices without a fee market
- A secure bonding rate can't be achieved
- The foundation tax is set to 0%
- No ecosystem growth treasury

Findings describe the current state of the token economy that we consider an area for improvement. However, it doesn't necessarily mean that findings are issues that should be fixed.

Potential improvement proposals for the findings are:

- Introduce growth treasury, growth treasury tax, and Protocol Owned Liquidity
- Set validator minimum commission rate to 5%
- Set foundation tax
- Create a gas fee market via Skip Protocol
- Create "liquid supply bonding rate" monitoring

Proposals are our ideas that will be presented to community discussion. All changes should be made through the governance vote.

Our team also analyzed the recent inflation reduction to 9%. Results of our research confirm that the 9% inflation rate is reasonable for Secret Network - keeping validators in profit to run the nodes and having sufficient rewards for stakers. A price increase of SCRT token may allow to further reduce inflation to 6%.

SCRT Tokenomics As-Is

In the SCRT Tokenomics As-Is section, we outline the SCRT token's economic model and its utility. SCRT - native token of Secret network used to pay for transactions. It has 3 utilities within the Secret network:

Governance

SCRT tokens can be staked to participate in Secret network governance. SCRT enables holders to vote on network proposals. Each staked SCRT allows participation in decision-making processes such as protocol upgrades, parameters change, and resource allocation.

Voting on Secret Network is powered by the SCRT token: every staked SCRT is equivalent to 1 vote. Proposals have a 7-day voting period and delegators can change their vote until the last block.

Staking

The SCRT coin has dynamic inflation to maintain protocol security, rewarding participants for securing the network. Staked users and delegators earn rewards, while validators receive commissions to sustain their operations. Inflation varies based on staking ratios: currently at 9% if staked SCRT is below 66%, gradually declining to 7% if staked SCRT exceeds this threshold.

The community tax and foundation tax is taken from stakers rewards.

Staking yield is calculated via the formula:

$$Yield = \left(\frac{InflationRate}{BondedRate}\right) \times (1 - FoundationTax - CommunityTax) \times (1 - ValidatorCommission)$$

Transaction fees

On Secret Network, users must pay a gas fee for the blockspace in a block. Validators determine fees through their node settings. Transaction fees on Secret Network are distributed to stakers, increasing their yield.

Gas price is currently fixed to 0.05 uSCRT (Low), 0.1 uSCRT (Medium), and 0.25 uSCRT (High) per unit. However, validators may vote to change the gas price per unit.

Findings

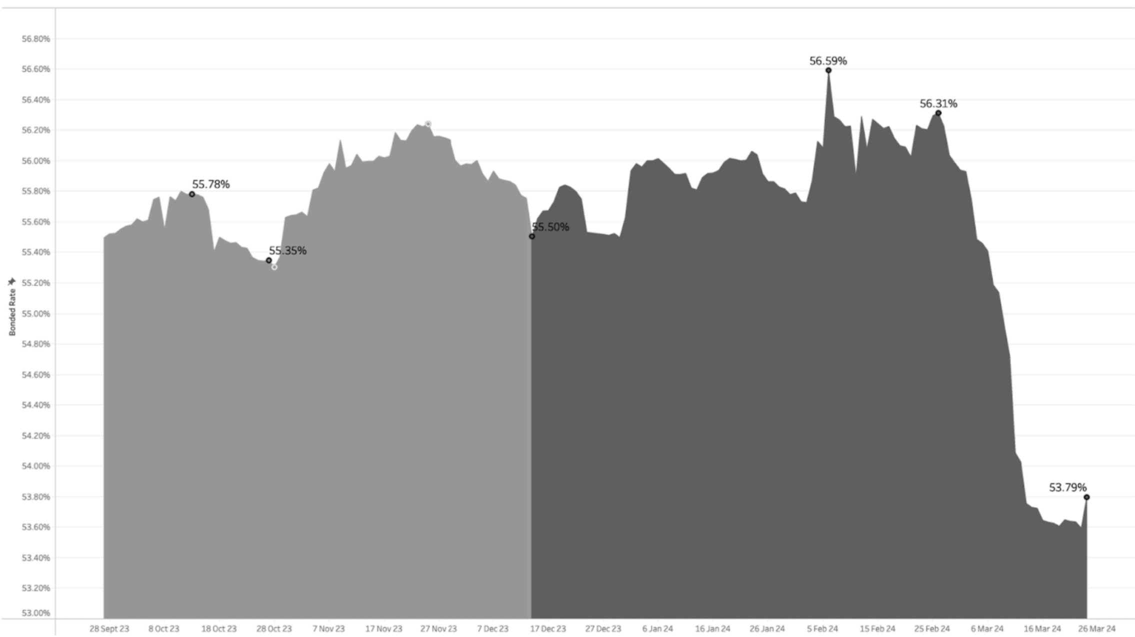
The Findings section provides a comprehensive overview of the results obtained through the tokenomics review. This section aims to highlight the key observations and issues identified during the analysis.

Inflation is capped at 9% after a reduction

In December 2023, Secret governance decided to reduce the max inflation rate to 9% via [Proposal 287](). It reduced inflation from 15% to 9%. As a result, we can observe:

- Staking APR reduced from 25% to 15%
- Validator rewards were reduced by ~40%
- The number of validators was not changed
- Inflation hit and always stayed at max inflation rate - 9%

Bonded rate was not affected by inflation change as we can see on the graph below. The bonded rate was mostly affected by price growth because we can observe CEXs SCRT inflow at the beginning of March 2024.



Additionally, the price of SCRT on the 7th of December 2023 (proposal vote date) was ~0,37$. Thus, to have the same yield and validator rewards in USD terms, the price of SCRT should be ~0,6$.

Because the bonding rate decreases, inflation hits the maximum value and stays at 9%.

No minimum commission rate for validators

Secret Network doesn't force validators to charge any minimum commission amount. As a result, it creates several risks for the ecosystem:

- Centralization risk - most of the validators rely on commissions to cover node operations. Some validators have as low as 0-1% commission which makes their delegation more attractive to SCRT holders. However, other validators take 5+% of the commission to cover expenses and they either need additional incentives or they may leave the ecosystem, which creates a centralization risk.
- Competition in Commission, not in quality - no floor for commission creates competition for commission reduction, not in node operations quality, for example, governance participation, uptime, or block misses.

At the moment of report 18 out of 75 validators have less than 5% commission totalling ~35% of voting power. The validators' commission distribution is the following:

Fixed gas prices without a fee market

On Secret Network, there's no fee market, so there's no fee-based prioritization in the standard tendermint binary for Secret's operation. Increasing transaction fees will attract more validators to process the transaction, potentially speeding up confirmation, but it won't prioritize the transaction in the queue.

The current gas fees were determined by Proposal 289 - 0.05 uSCRT (Low), 0.1 uSCRT (Medium) and 0.25 uSCRT (High).

Note. All gas fees are distributed as validator rewards, however, the total amount of fees is much lower than inflation rewards.

Max gas per block is set to 6 Million gas and block time is ~6s. Routed DEX swap on Shade swap can take 1-2 Million of gas, which means that one block can have no more than 6 routed swaps per block = 1 TPS for the network. It may create a transaction queue during high load periods and the transactions won't be prioritized by fee.

There is also no reason to set higher gas for network users because it won't change execution time.

A secure bonding rate can't be achieved

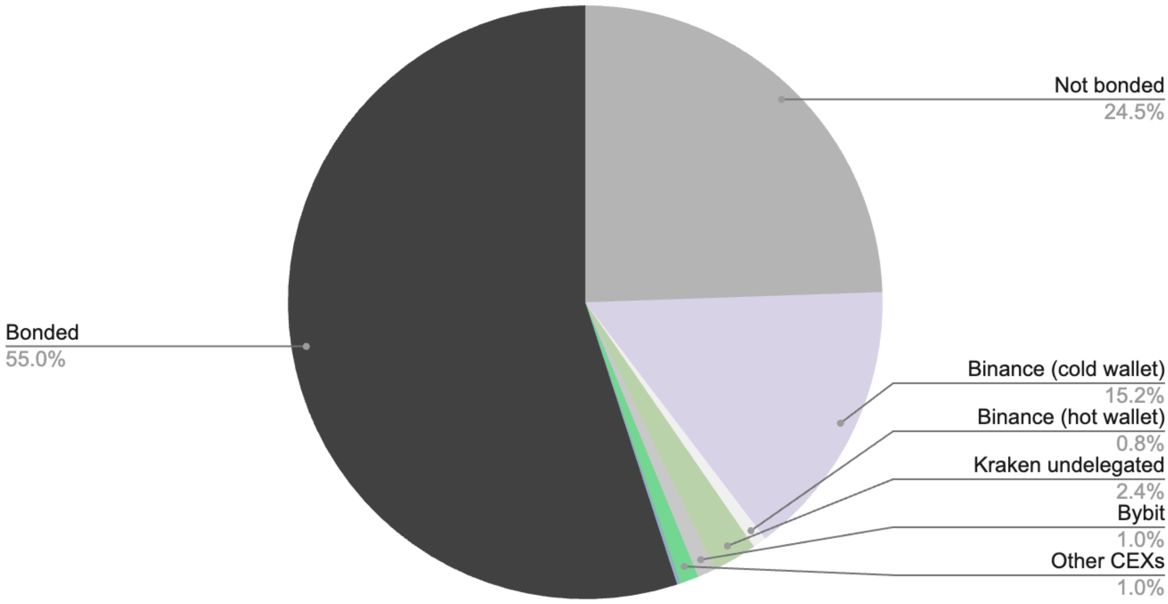
The target bonding rate of Secret Network is 67%. However, a big part of the supply stays on CEXs, which don't delegate SCRT (even if they have the option):

- Binance (cold wallet) - 41.1M SCRT Tokens (~15.2% of total supply)
- Binance (hot wallet) - 2M SCRT Tokens (~0.75% of total supply)
- Kraken undelegated - 6.39M SCRT Tokens (~2,4% of total supply)
- Bybit - 2.66M SCRT Tokens (~1% of total supply)

Additionally, Kucoin, Mexc, Gate, and other exchanges got >1% of the token supply in their wallets.

Also, some SCRT is locked on-chain, for example, Shade sSCRT - staked SCRT pool has ~0,2% of SCRT supply.

The distribution of the supply is presented as of the 1st of April 2024.



It makes 20+% of SCRT tokens impossible to bond, thus, it's practically impossible to achieve a secure bonding rate.

The secure bonding rate is not achieved by most of the Cosmos ecosystem chains:

Chain	Bonded Tokens, %
Cosmos Hub	62.2%
Osmosis	55.7%
Injective	60.8%
Fetch	27.4%
Celestia	54.5%
Canto	22%
Dymension	57.4%
Secret Network	**55%**

The foundation tax is set to 0%

The yield for the SCRT stakers is taxed via community tax (2%) and foundation tax (0%). The foundation tax was temporarily set to 0% via Proposal #239, which was executed in May 2023.

However, the foundation tax is designed to create SCRT inflow in the Foundation treasury that can be used for operations and funding of ecosystem initiatives.

Setting a 0% foundation tax caused a minor increase in stakers' APR, thus, increasing the supply side of the SCRT token.

No ecosystem growth treasury

During the analysis, our team identified that there are no allocated tokens to fund growth within the Secret Network. Ecosystem growth is currently funded by Secret Labs and Secret Foundation, which is limited and not sustainable. It also limits the possibilities of ecosystem support and incentives for new projects and new users.

For example, Arbitrum Foundation introduced a short-term incentives program in 2023 that incentivized projects and users to grow activity and TVL. As a result, Arbitrum TVL growth from 1st OCT to 29 FEB was 1,5b USD.

Growth treasury could be used as:

- Protocol-owned liquidity that creates TVL for specific projects or pairs and earns revenue
- Project incentives that can be distributed to either the ecosystem project or its users
- Funding marketing campaigns and quests to attract new users and liquidity to the chain

Proposals

The Possible Solutions section of the report outlines our vision of action steps to address the issues identified during the research. This section aims to provide actionable insights and strategies to mitigate risks, improve tokenomics, and enhance overall performance.

Introduce growth treasury, growth treasury tax, and Protocol Owned Liquidity

Growth treasury - tokens treasury that can be used for ecosystem incentives, growth, and especially Protocol-Owned Liquidity (POL) and business development. We propose to create a growth treasury for the Secret Network that will be managed by either the Secret Network Foundation or a special governing body created separately. We suggest funding it by % from the inflation supply to generate ongoing inflow to the treasury. The secondary option that could be considered is funding Growth treasury from temporary inflation increase.

To determine the optimal growth treasury tax (GTT) we created the Secret Network inflation model in the Google Sheets and monitored several parameters based on different growth treasury tax inputs (Parameter Sensitivity Analysis).

We used current values for inflation (9%), community (2%), and foundation (0%) tax, bonding rate (54%) and 5% for validator commission. We analyzed the staker's APR change due to the introduction of GTT, and the results are:

Tax %	0%	5%	10%	15%	20%
Yearly inflow to growth treasury	0	1,305,000	2,610,000	3,915,000	5,220,000
Staker APR	15.52%	14.73%	13.93%	13.14%	12.35%
Growth treasury as % of supply	0.00%	0.45%	0.90%	1.35%	1.80%

We consider 5%-10% as low GTT because 1,3M-2,6M SCRT per year is not enough to run big growth campaigns. For example, if 2.6M SCRT is distributed as liquidity to 10 projects, it would be ~20k SCRT per project per month.

After that we calculated edge case staker APR with 67% of bonded rate and got 9,95% for 20% GTT, however, it's important to keep staker APR over the psychological level of 10%. Thus, we consider reasonable growth treasury tax as 15% which would sufficiently cover growth initiatives and keep staker APR around 13%.

We propose POL initiatives to increase the DeFi liquidity both on Secret Network and on other chains where SCRT is traded.
The protocol-owned liquidity can be distributed in two ways:

1. Providing liquidity to pairs
2. Providing incentives for LPs

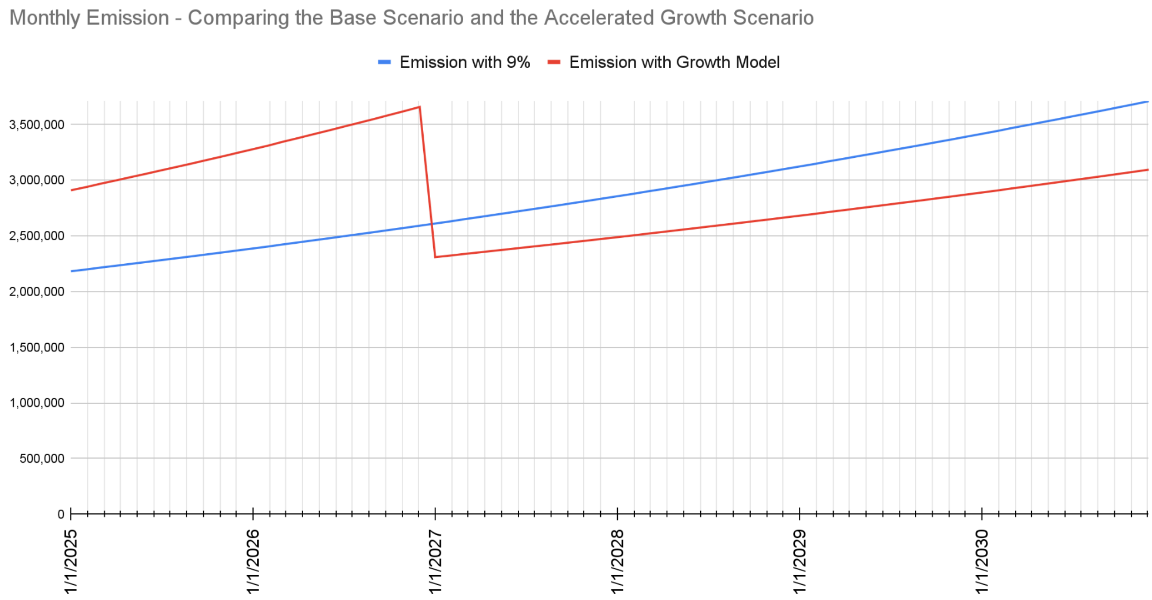
In our experience, and from past experience on Secret Network, direct incentives for LPs have a limited effect. Firstly, there is a lot of competition in the market for LPs and APR should be high to maintain liquidity. Secondly, LPs need special relations or business connections with the foundation, thus, LPs may remove liquidity after the rewards stop.

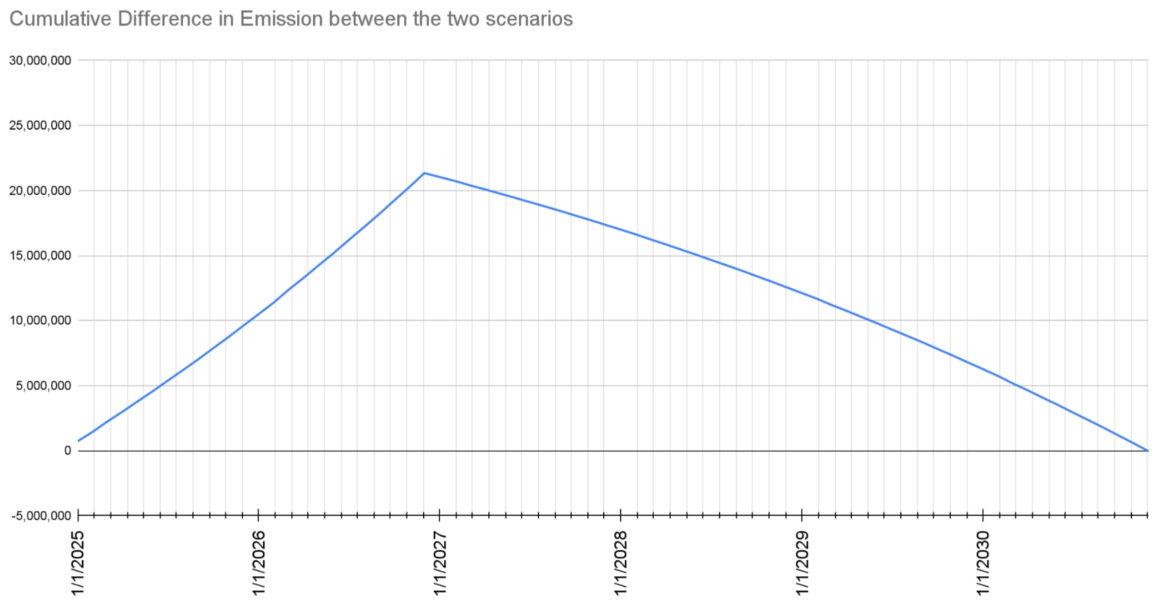
Therefore, we propose providing liquidity from the Growth Treasury directly to DeFI projects. A process or committee can be established to govern the distribution of liquidity. We recommend carefully evaluating both technical and impermanent loss risks while providing liquidity, and creating an easy way to monitor the performance.

Collected fees from POL should be retained in the growth treasury to create a growth flywheel that constantly boosts new and existing protocols on the Secret Network.

The second option to fund growth treasury is to temporarily increase inflation to generate growth funds, and then decrease it to keep the total emission constant over the time period. For example, the inflation can be increased for 2 years, followed by a temporary decrease in inflation for 3 years, so that the total amount of SCRT emitted over five years remains the same as it would be with the 9% inflation. For this approach, APR for the stakers wouldn't be changed during the increased inflation stage but would go down during the decreased inflation period. Additional inflation tokens from a growth treasury would never be sold but used as liquidity provision and re-used within the network. Tokens that were not deployed after a certain period, e.g. 36 months, should be burned. A small trusted governance body may be appointed to govern the allocation of POL funds to various initiatives - the body to be comprised of prominent community members, representatives of key projects, and the Foundation.

As an example of this strategy, inflation can be increased to 12% in the first 2 years and then decreased to 7.5% for 3 years. The monthly emission and the cumulative difference in emission in the base scenario and the accelerated growth scenario are shown in the charts below:





We've assessed the potential growth treasury inflow for different inflation increase parameters.

Inflation Increase	**1%**	**2%**	**3%**	**4%**	**5%**
Yearly inflow to growth treasury	3.2M	6.4M	9.6M	12.9M	16.2M
Staker APR	15.83%	15.83%	15.83%	15.83%	15.83%
Growth treasury as % of supply	1.00%	2.00%	3.00%	4.00%	5.00%

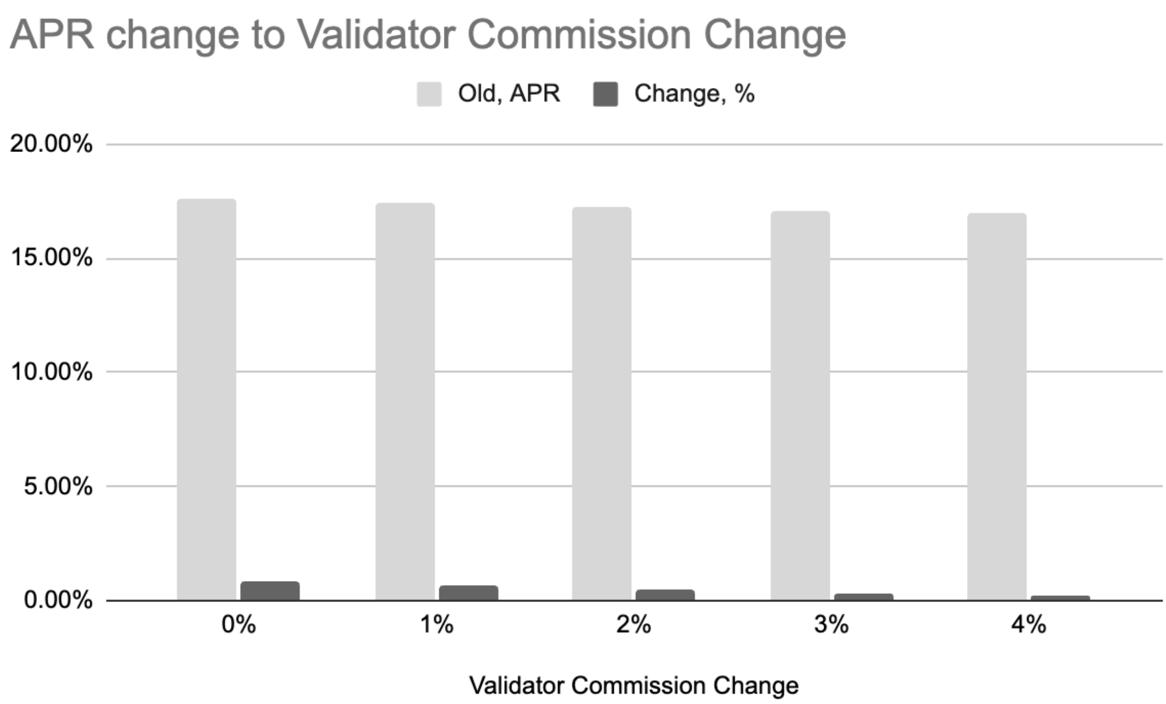
Set a minimum commission rate

The minimum commission rate of 5% for staking rewards is a best practice for most of the chains within the Cosmos ecosystem. We analyzed the top 10 Cosmos chains by Market Cap and found that only one chain has a lower commission rate than 5%. Fetch has a 0% minimum commission rate; Cronos, Atom, Injective, Celestia, SEI, Akash, DYDX, KAVA, Axelar, and Osmosis have a 5% minimum commission rate. However, Fetch has very low bonded tokens % - 27,4%.

The 5% minimum commission rate will incentivize validator competition over quality and create a fairer and friendly environment for smaller validators.

However, some validators don't want to take the commission. For this case, we recommend not to force the validator to take commission for itself but burn it. Thus it will further reduce the inflation of the Secret Network. For the assumption that validators with <5% commission will burn extra commission tokens, it will be ~330k SCRT tokens yearly, reducing inflation. by ~0,12%.

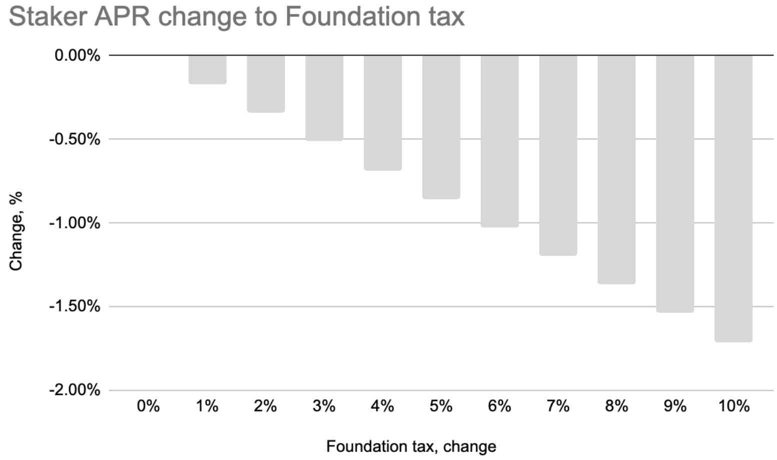
Also, making a minimum commission rate will reduce the APR for stakers who stake with validators with lower commissions. The APR change would not exceed 1%:



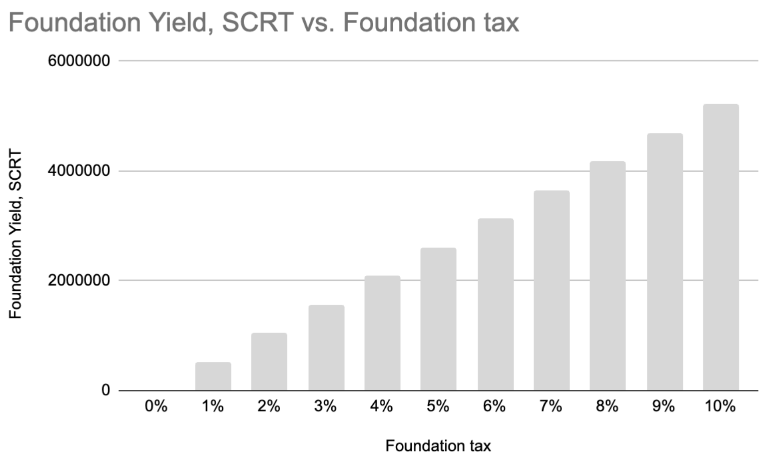
Set foundation tax

The foundation tax is temporarily set to 0%. However, the foundation needs predictable SCRT income to plan and execute growth activities. Currently, the foundation limits its activities and campaigns to either free or low-cost. The foundation's purpose is to promote the SCRT ecosystem, and its roadmap includes a comprehensive strategy to achieve this across content, partnerships, messaging, influencers, social media, and ecosystem support and incentives, most of which can only be undertaken with an ongoing source of predictable income.

The increase of foundation tax will decrease APY for stakers, thus, it will decrease the supply side of SCRT token. As far as foundation tax is constant % from inflation, the staker APR change would be dependent on tax percent linearly: -0.17% APR for each 1 percent increase. Staker APR changes for the different levels of foundation taxes:



The foundation treasury income depends on the foundation tax:



As we can see from the graphs when the foundation tax is set to 6%, Staker APR is reduced only by 1%, however, it funds a foundation with ~3.1M SCRT tokens that can be used for various campaigns and activities. Thus, we propose to introduce a foundation tax however the actual % should be agreed via governance vote.

Create a gas fee market via Skip Protocol

We recommend creating a fee market for the Secret network, where gas prices should depend on block space demand. It would create a self-regulated market for transaction fees and, potentially, increase value capture by the protocol.

We consider the Skip protocol as the best way to implement the gas fee market for several reasons:

1. Cost and time. The development of the custom fee market requires a lot of development effort. Integration of the Skip protocol will save a lot of foundation resources. Moreover, the development of a new fee market will take several months, heavily delaying the launch. The integration can be done within several weeks.
2. Security. Skip protocol has passed audits and a proven track record with existing integrations within the cosmos ecosystem. On the other hand, a custom solution needs to have audits (which take money and time) and introduce additional security risks to the network.
3. Searchers. Skip protocol has its own searchers that can be easily onboarded to operate on the OFA. Custom solutions will require additional effort from searchers to integrate and additional effort from the foundation to onboard searchers.

Skip protocol has built-in transactions backrun, which introduces a new revenue stream. This revenue stream can be used for foundation reserves or can be burned. SCRT burn will introduce EIP-1559-like deflation mechanics to the Secret network.

Create "liquid supply bonding rate" monitoring

Bonding tokens is an economic security measure to secure PoS blockchains. The target bonded rate is 67%, however, it can't be achieved in the Secret network due to high balances of SCRT tokens on CEXs. Moreover, most of the Cosmos ecosystem chains can't achieve a target bonded rate as well. We propose to introduce a new parameter liquid supply bonding rate.

Liquid supply bonding rate (LSBR) - % of token bonded to the total supply minus exchanges supply. We consider CEXs as good actors that won't execute economic attacks on the network. Thus we can calculate the liquid supply bonding rate using the formula:

$$LSBR = \frac{Bonded\ Tokens}{Total\ Supply - Sum(CEXs\ SCRT\ Balances)}$$

Real-time monitoring for LSBR will ensure the economic security of the Secret network.

Current LSBR would be ~69% which can be considered as secure, compared to the bonded rate of 55%.

Inflation Analysis

The Inflation Analysis section provides an overview of the results of our inflation research. This section aims to evaluate the fairness of 9% inflation.

Methodology

Our team created a Google sheet that models the current inflation mechanics of Secret Network. It contains all parameters from the inflation formula and additional growth treasury tax parameter (it can be set to 0 for the current implementation). The model can be used as a calculator template for both stakers and validators.

Our methodology was based on Parameter Sensitivity Analysis where we checked how to change staker APR and validator rewards based on different inflation parameters.

We also had several hypotheses for the current research:

1. A validator with 5% commission and 600k delegated SCRT should earn at least 200 USD per month. The hypothesis is based on some validator's feedback. 600k SCRT was taken as a benchmark because it's enough to have 600k SCRT to be in 95% of cumulative Voting power and it represents ~0,4% of the total supply.
2. The price range for the SCRT token is 0,4-0,8 USD as a range of the last 3 months from the final report date. We'll be focusing on the average validator reward value for 5 prices in the range.
3. Staker APR should be higher than 10% as psychological value for stakers based on community members' feedback
4. Validator rewards are taken 100% from inflation
5. Parameters values that are used as current conditions: Community tax - 2%, Foundation Tax - 0%, Growth Fund Tax - 0%, total supply - 290000000 SCRT.

The inflation model used in the spreadsheet can be summarized via 2 formulas.

$$ValidatorReward = \left(\frac{DelegatedAmount}{BondingAmount}\right) \times Supply \times InflationRate \times 5\% + TxFees$$

$$Yield = \left(\frac{InflationRate}{BondedRate}\right) \times (1 - FoundationTax - CommunityTax) \times (1 - ValidatorCommission)$$

Outcomes

1. Validator rewards satisfy 200+ USD/month revenue criteria when inflation is higher than 7% (current conditions)
2. Validator rewards satisfy 200+ USD/month revenue criteria when inflation is higher than 8%. (current conditions with secure bonded rate 67%)
3. Validator rewards satisfy 200+ USD/month revenue criteria when inflation is higher than 8% (current conditions with 4% foundation tax and 15% growth treasury tax)
4. Validator rewards satisfy 200+ USD/month revenue criteria when inflation is higher than 10% (current conditions with 4% foundation tax, 15% growth treasury tax, and secure bonded rate 67%)
5. Validator rewards satisfy 200+ USD/month revenue criteria when inflation is higher than 9% (current conditions with price range 0.4-0.8 USD)
6. Stakers APR satisfies 10+% criteria when inflation is higher than 6% (current conditions).
7. Stakers APR satisfies 10+% criteria when inflation is higher than 8% (current conditions with secure bonded rate 67%).

Additionally, we observe that the number of validators hasn't changed after the inflation reduction. It proves that the validators' rewards are sufficient with current price levels.

From the analysis above we can see that 8% is the minimum inflation rate that satisfies our criteria at the current conditions. However, 9% is totally reasonable value that is much lower than the previous value of 15% and protects validators from slight price drops.

Further inflation reduction down to 6% can be targeted as a mid-term goal if the price goes to the higher range or validators start earning higher transaction fee rewards.

Disclaimer

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