



# **CUBE**

## Token Economics Whitepaper

**Cube Labs**



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## ● Tokenomics

Cube is a Layer 1 public and permissionless blockchain where the tokenomics is designed to maintain a stable and decentralized network, whilst promoting sustainable long-term development. Within the ecosystem there are three key roles: Nodes, Users and Developers. Together, these roles are what taken into consideration when designing the tokenomics.

**CUBE** is the native token of the ecosystem. it serves the following functions:

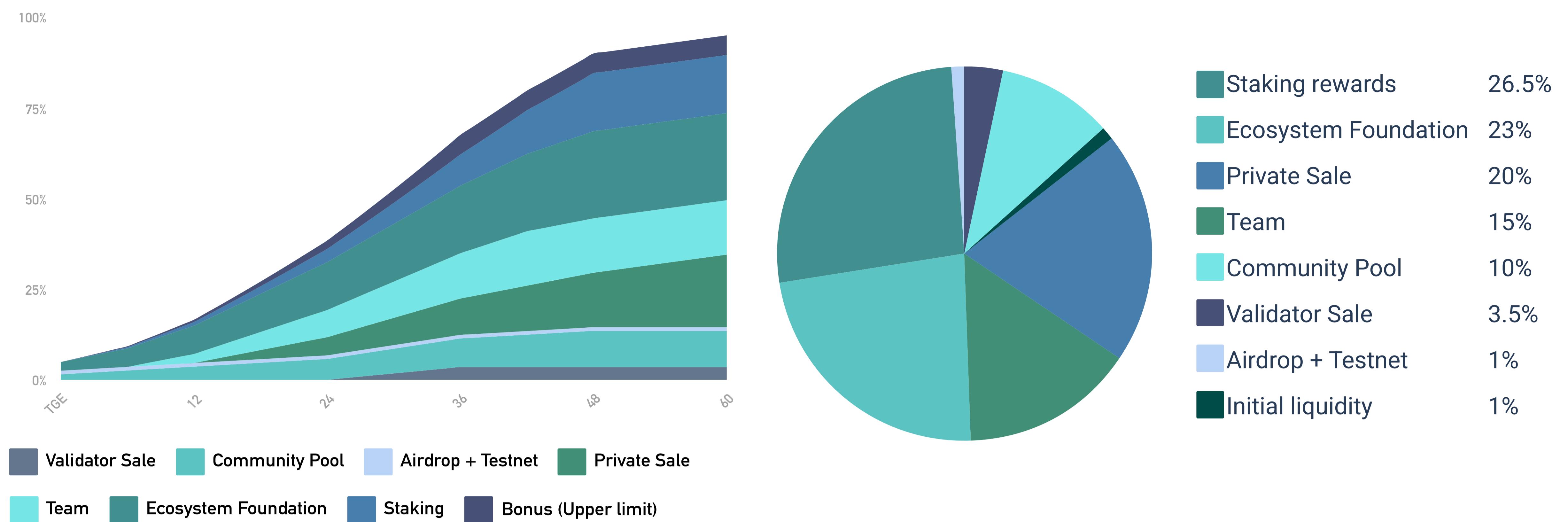


## ● Token Distribution

**CUBE** adopts the economic model of moderate inflation and the initial issuance of tokens is 1 billion. No additional tokens will be issued within four years after the mainnet goes online. Four years later, **CUBE** will start the process of moderate inflation. The Cube network uses dual-token model, the native token sCube and the governance token vCube. The generation and distribution of these tokens are determined by the staking amount and staking time, which will be described in detail later.

The release of **CUBE** tokens will begin immediately after the Token Generation Event (TGE) and will follow a linear vesting approach where once monthly a set amount of tokens become available for holders.

Portion	%	Vesting and Cliff
Validator Sale	3.5%	24 month cliff, 12 month vest
Community Pool	10%	15% at TGE, 48 month vest
Airdrop + Testnet	1%	No lock terms
Private Sale	20%	12 month cliff, 24 month vest
Team	15%	6 month cliff, 36 month vest
Ecosystem Foundation	23%	10% at TGE, 48 month vest
Staking rewards	26.5%	Released according to network stake rate
Initial liquidity	1%	Locked in initial Protocols



### Releasing Schedule

1.1

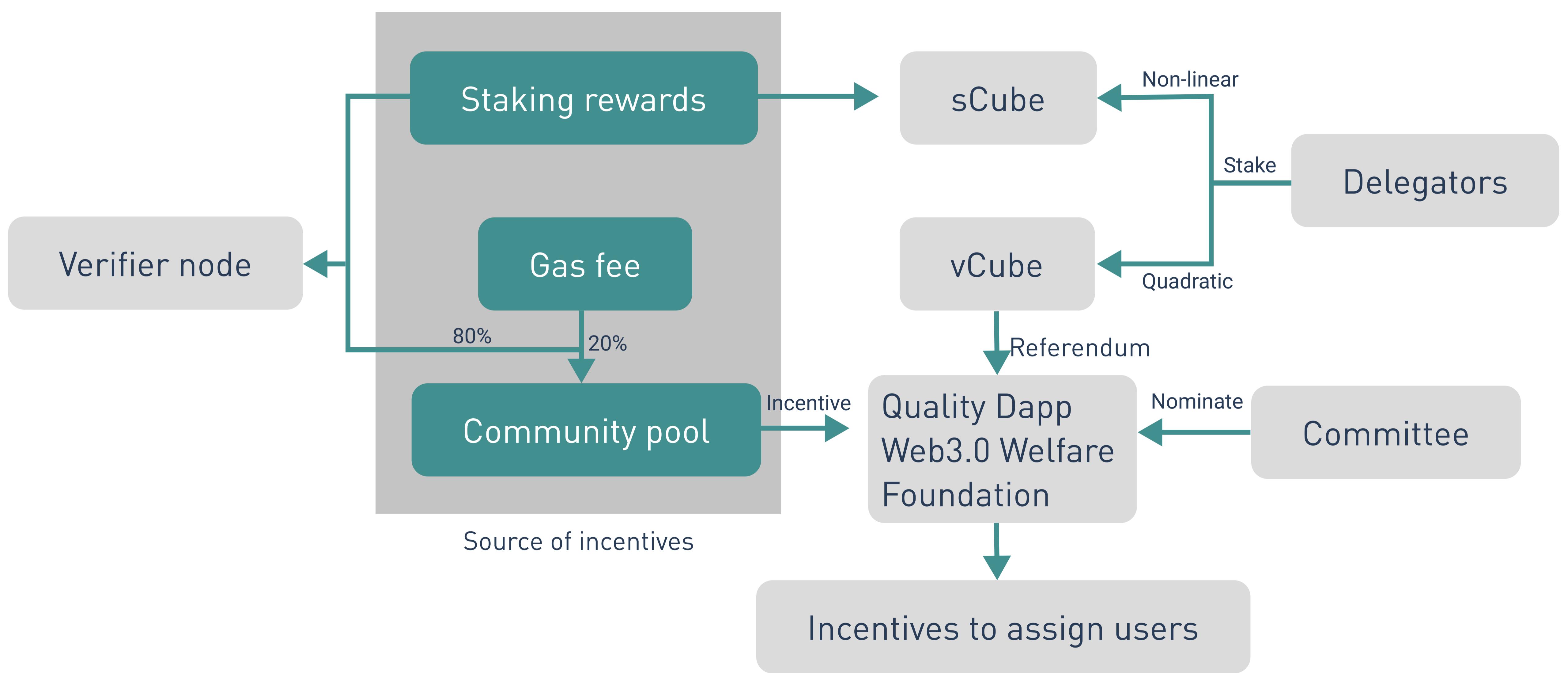
### Token Allocation

1.2

The token distribution plan includes a 26.5% staking reward, which goes to the node runners. The rewards will have been fully distributed by the end of the fourth year. It is divided into two integral parts, whereas the first part allocates a portion of staking reward to the functional nodes every week and the second part is to incentivize stakers to hold **CUBE** token for longer period of time.

## • Infrastructure Utility

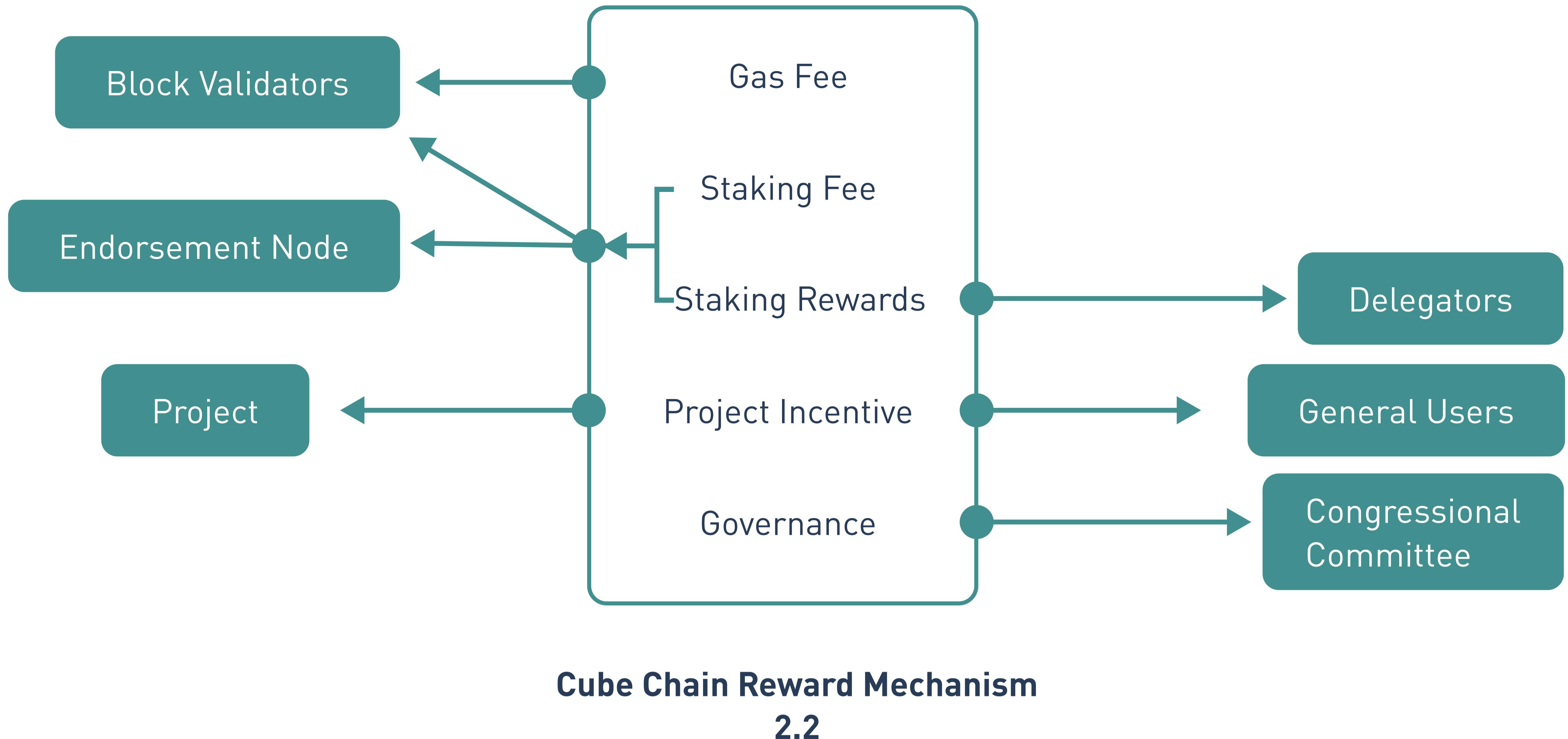
The Tokenomics outline the macro utility cases of **CUBE**. The Token Utility section will aim to specify how the ecosystem functions in macro detail.



### Function Flow Chart

2.1

As the main participant in the network, the verifier node rewards will come from transactions as. Other node types do not directly participate in network verification. Principally, nodes get part of the stake rewards for helping the node gain consensus. The specific reward categories of each role are shown in 2.1.



## • Staking CUBE

A key part of the utility of **CUBE** is the consensus mechanism which staking provides. When users stake, they have the choice to receive either vCube that carry voting power or sCube for rewards. vCube is used for community proposals and fuel the ecosystem projects (more detail can be found in the relevant section), whereas sCube is used to obtain staking rewards. There will be an identified parameters for how much tokens validators can stake ( $50,000 < x < 24,000,000$ ). There is no minimum number of tokens needed to vote in the node election campaign however, at least one **CUBE** is required.

### vCube Tokens

Community members who want to participate in governance must stake their **CUBE** to receive vCube. The ratio between vCube and **CUBE** tokens will be 1:1. vCube's sole purpose is to represent voting within the network.

### sCube Tokens

Similar to the vCube, in order to obtain sCube, users must stake their **CUBE** in a 1:1 ratio. sCube serves as a voucher to receive staking rewards. After staking **CUBE**, users may also receive additional rewards in Cube tokens.

The additional bonus is funded from staking rewards, accounting for 5.92% of the total issuance. After users stake **CUBE** and receive sCube, they can exchange sCube back to **CUBE** at any time and receive their assets back with a bonus.

Every time the user stakes, a timestamp is recorded along with the amount staked ( $t_i$  and  $a_i$  respectively)), as shown in the formulae below.

$$\text{Stake Amount} = \sum_{i=1}^n a_i$$

$$\text{Weighted Time} = \frac{\sum_{i=1}^n t_i * a_i}{\sum_{i=1}^n a_i}$$

When the  $b_m$  amount is withdrawn at the  $T_m$  time, calculate the staking period and staking reward:

$$\text{Stake Time} = T_m - S_i$$

$$\text{Staking Reward} = \text{MIN}\{3, \text{Staking Time}\} * \text{Annualized Fixed Interest Rate} * b_m$$

Where  $b_m$  refers to the number of **CUBE** being withdrawn at any given moment in time and  $T_m$  refers to a specific moment.

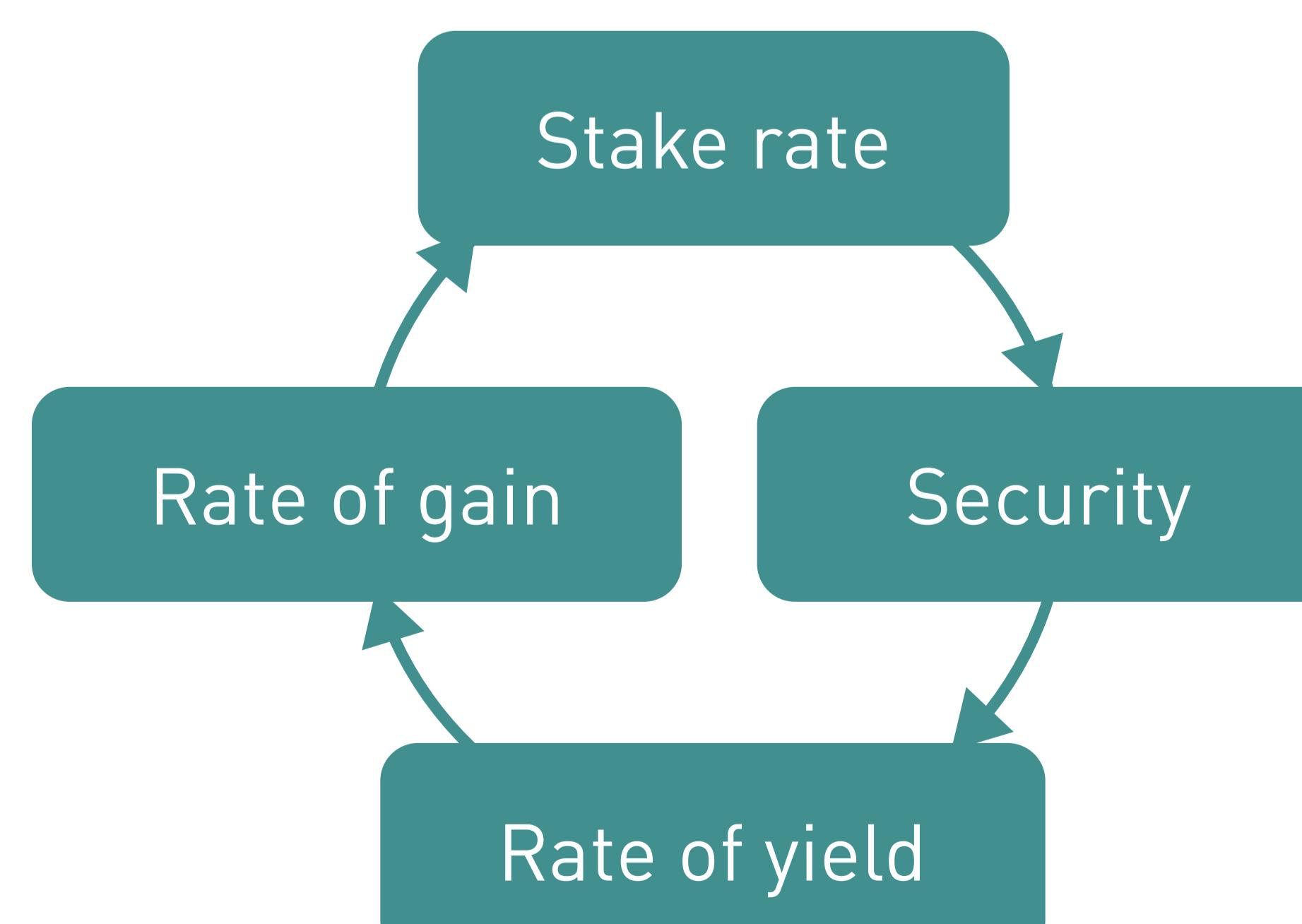
Stake Period	Interest Rate
Less than 3 months	0%
Between 3 months and 1 year	3%
Between 1 year and 2 years	6%
Between 2 years and 3 years	9%

Note: According to the limit value calculation, the maximum annualized fixed interest rate value is set at 9%, and the maximum stake reward duration is 36 months.

## Stake rewards

### Target stake rate

The stake rate of nodes is determined by the security of the network, the yield of nodes and the additional issuance rate of inflation. With these circumstances in mind, the target stake rate of the network is set at 50%.



### Design principle of the target stake rate

3.1

## • Validator Rewards

In order to ensure the security of the chain and increase the value of **CUBE**, the network encourages certain staking behavior. There are three roles involved in staking. These are: validator nodes, endorsement nodes and the delegators. The delegator obtains the corresponding staking rewards by staking **CUBE** at a trusted node, and the node will charge a commission fee. Both the delegator and the node will thus be sharing the risks and the rewards. If the node carries out improper actions on the network, they will share the punishment with the delegator.

The total stake rewards are maintained at roughly 20% for the first four years, and then, according to the regulation of additional token issuance, the range of the stake reward will fluctuate between 5% and 18%. In order to ensure fairness, the actual rewards of each node are distributed according to the proportion of the staked tokens to the amount of tokens staked in the network, which can be written as:

$$\text{Node rewards} = \frac{\text{Amount of tokens staked to node}}{\text{Amount of tokens staked across the network}} * \text{Total rewards released}$$

The node reward rate is related to the network stake rate, that is:

$$\text{Node return rate} = \frac{\text{Target stake rate} * \text{target rate of return}}{\text{Network actual stake rate}}$$

If the node is going to withdraw the staking tokens, it must wait 21 days to do so.

## • Transaction Fees

Each transaction on the network requires confirmation from the verifier nodes and is then packaged into the block. The network charges user's transaction fees based on two parameters:

- Nodes rewards – 80% of gas fees go to the verifier nodes
- Developer incentives – 20% of gas fees are distributed back to the community

Instead of a fixed price, the transaction fees are determined according to the current state of the network. Cube will provide users with low transaction fees and high performance output.



## ● Token Supply

**CUBE** has an inflationary model which adapts to a dynamic regulation mechanism formed around the target staking rate. The formula is expressed as follows:

$$-k * \frac{a' \% - a \%}{a \%} = \Delta b \%$$

In the formula,  $a\%$  is the target stake rate, namely 50%,  $a'\%$  refers to the current actual stake rate.  $\Delta b\%$  means the change rate in token inflation, and  $k$  stands for the coefficient of the relationship between the change of the stake rate and the change of inflation. The value of  $k$  can be adjusted through governance.

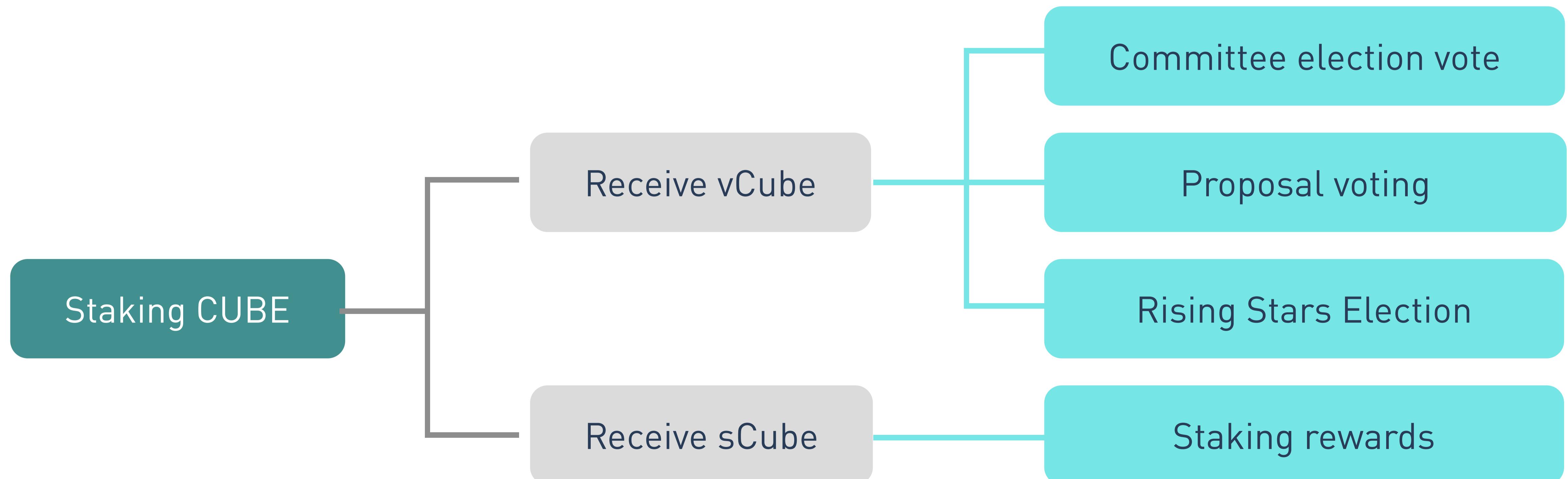
The token inflation rate is calculated once a week in the block, issuing 90% to nodes and the remaining 10% to the Community pool.

$$c \% = \frac{b \% * 0.9}{a \%} = 1.8 * b \%$$

In the equation,  $c\%$  is the node yield rate,  $b\%$  stands for the inflation rate, and  $a\%$  refers to the target stake rate. The range for the rate of token inflation is between 2.8% and 10%. If it exceeds the range, the rate is determined as the boundary value, and the corresponding node yield will be set to between 5% and 18%.

## ● Governance

Besides voting rights, holders of vCube can stake their tokens for incubating upcoming projects as well, known as “Rising Stars”



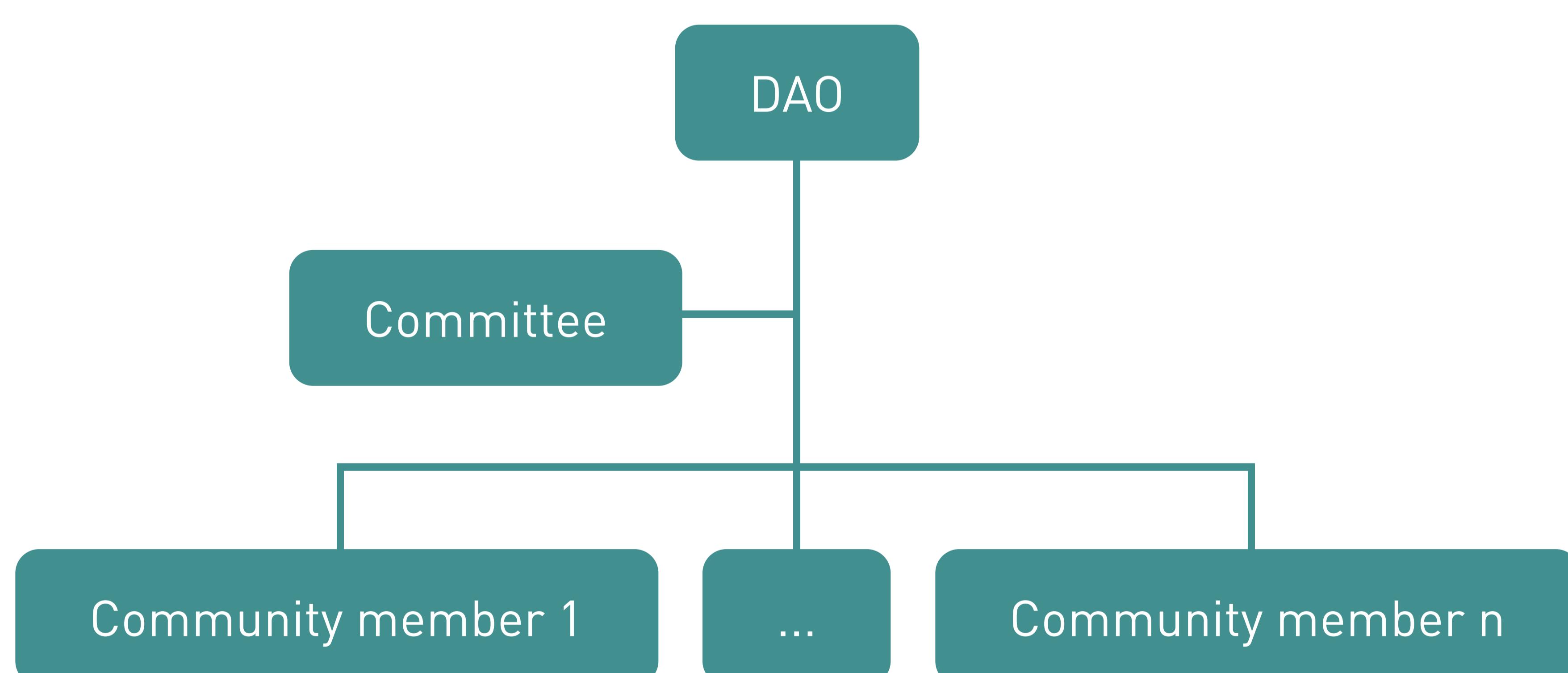
## Governance Principles

Although community can vote for how platform can be ran. There will still be a set of parameters and guidelines to help maintain balance of the network.

1. Respect community Autonomy – The community is responsible for most major decisions
2. Ensure the Security of the chain – Prohibit vote bribery and attack proposals
3. Act with Efficiency and fairness – Divide and review community proposals
4. Protection - protect the interests of token holders

## Voting Structure

Incoming proposals are voted on by DAOs. Any member has the right to initiate a proposal but penalties will apply to attack proposals or proposals designed to directly hurt the network. Proposers stake vCube in order to authenticate their proposal as genuine. The staked amount acts as a form of collateral which can be removed.



### On-chain Voting Structure 7.2.1

#### Committee

The committee regulates the DAO and is responsible for security and the handling of any emergencies that may arise. The committee consists of nine members, each serving a one-year term. In the initial stages, committee candidates will be nominated by the founding team and then elected by a community referendum. In the future, community members will be able to initiate votes of trustlessly in committee members via quadratic voting.

When vacancies occur, positions will be determined by elections, anyone can submit an application to become a committee candidate by staking vCube. Much like trustless votes, candidate elections will be determined by quadratic voting. After being elected, any staked vCube will be returned in full.

## Committee powers and responsibilities:

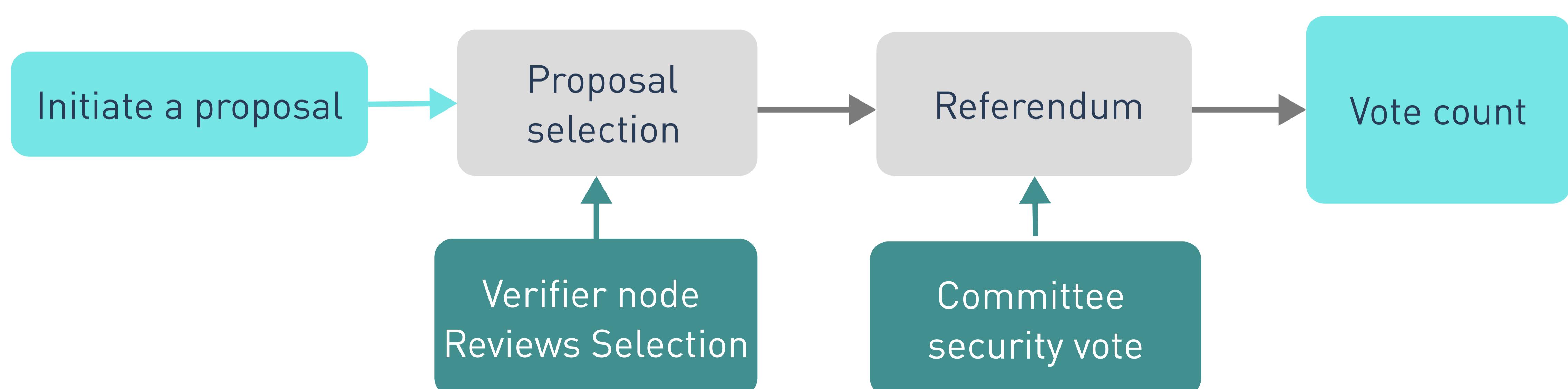
- Review proposals
- Act in the interests of the community in the event of major emergency
- Be responsible for the safety review of proposals before voting starts
- Have the temporary disposal right of major emergency events

## Procedural specification

A few procedural specifications are set in place to prevent corruption and malfunction. Firstly, the committee will only act when 51% of the network are in attendance. Secondly, committee voting will be conducted under a one-person one-vote system and when matters discussed are related to the personal interests of one or more members, the relevant party shall not participate in the voting. Thirdly, regular agenda items must be approved by more than half of all members, but major matters must be approved by more than two-thirds and a record of resolutions will be kept and signed by the members present and then publicized in the community afterwards.

Regular agenda items can be initiated by any community member through the following procedures:

- **Proposal initiation stage:** Any community member can put forth a proposal by staking a certain number of vCube (>100 Cube). At fortnightly intervals, the proposal with the top 20 staked vCube will enter the proposal Selection stage.
- **Proposal Selection stage:** Proposals entering the selection stage will be screened by the verification node to provide the committee with the most upvoted proposals for the community ( $x < 3$ ) to prevent excessive proposals from affecting the normal governance of the community.
- **Referendum stage:** The committee will vote on the proposals recommended by the nodes to prevent the emergence of proposals that are risky or harmful to the system. The proposal can be passed with a simple majority. If the proposal is not passed, the committee will provide feedback on their decision.
- **Referendum Vote Count:** In the referendum vote counting stage, users vote with vCube. After the proposal is passed, vCube will be locked for a period of time, and then returned to the user.

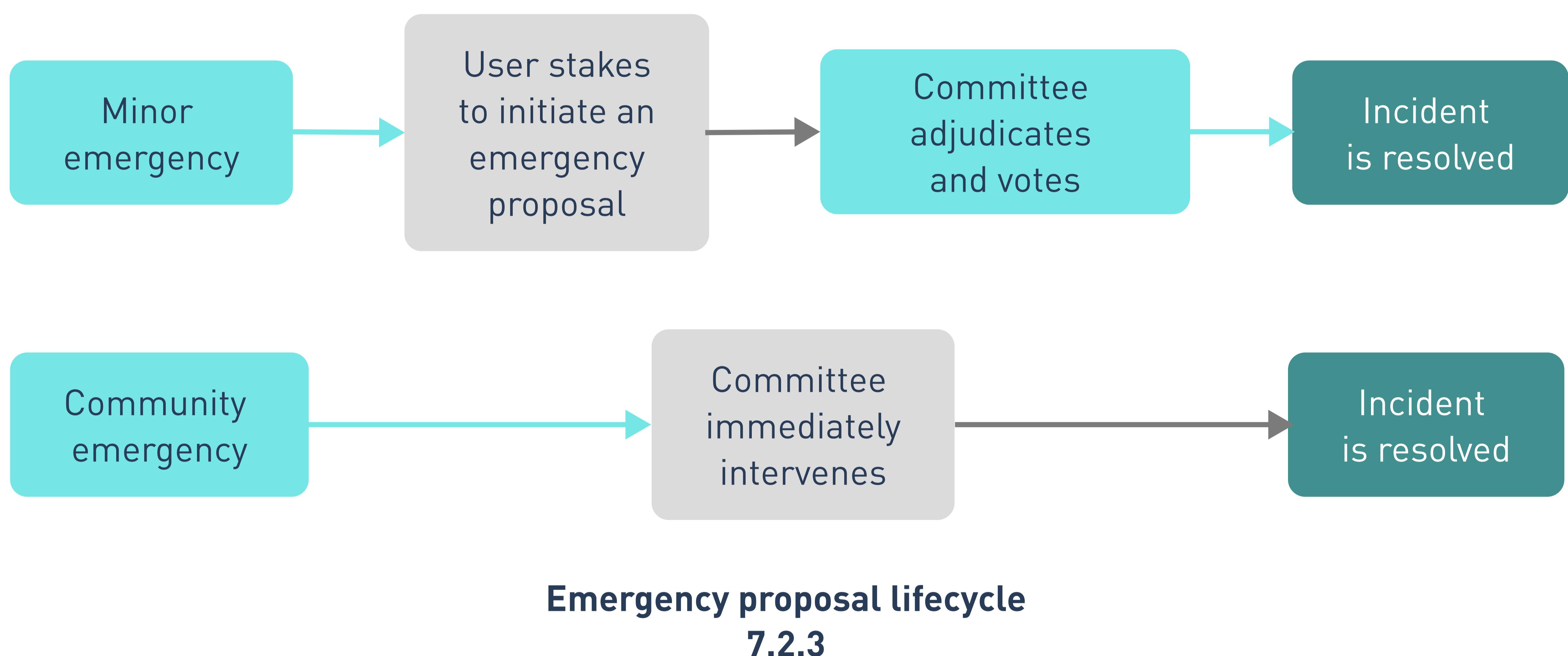


Flow chart of an ordinary proposal lifecycle

7.2.2

## Emergency proposals

For emergencies such as stolen assets, hacks and other major vulnerabilities, the community can quickly deal with these issues through the emergency proposal channel. If a community member abuses the emergency proposal channel, the vCube staked will be confiscated. The emergency proposal process is split between personal emergencies and community emergencies. When a user encounters an emergency they can stake a certain number of vCube, after which their proposal will be submitted to the committee for discussion. The community may dispose of the staked funds if the emergency system is used maliciously. For community emergencies, the committee will make a decision in order to handle the situation in the most equitable way possible. Major emergencies can be defined as events that endanger the security of the network.



## Protocol-level proposals

Major proposals will be submitted to the community by the developers and voted on by a referendum held by community members.



## Cube Rising Star

To encourage the creation of applications that contribute to the ecosystem, a portion of **CUBE** will be taken out from the community-treasury pool every month to reward the top ten applications voted on by users.

Candidates for this reward must be in the top 30 for either average daily TVL or total gas consumption and must have been online within the ecosystem for no less than two months.

The community can then select based on on-chain data and their own judgment. Community members with a specific number of vCube shall have the right to vote. Following these votes, the top 10 applications (accordingly to a simple majority) will be selected. The top 10 applications selected by the community members will share the bonus pool according to the proportion of the votes they secure. In order to encourage the long-term development of applications and prevent short-term tokens speculation, the bonus will adopt a deferred payment mechanism and distribute rewards to the top 10 applications on average every three months.

