

Snax

Tokenized Social Interactions

Snax Foundation

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Abstract

Over 2.5 billion people regularly use social networks [1] and messengers [2] in 2018. Majority of social platforms (Twitter, Facebook, Instagram, Youtube, and the rest) make their revenue by showing advertisements. At the same time, content creators do not receive any part of this revenue usually (except video-hosting partnership programs).

We want to offer a solution which allows to measure the value of a public content transparently and reward its creators without pushing social platforms to change established business models. Snax, a basis of this solution, is a blockchain-based system that can provide value for any social interaction on any public social platform. Any user, who has an account on Twitter, Reddit, Instagram or any other platform oriented towards the publicity of the posts, can receive SNAX tokens as a reward for their content engagement. Snax also provides the function of digital social currency [3] with free registration, instant zero-cost transactions and donation system.

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1. Introduction

1.1. People attention value

A wide spread of smartphones and high-speed mobile networks [4] results in social communications going online. From 2016 social media revenue from advertising rose 107% to \$68 billion for 2018 [5]. Thereby, it show \$22.84 in revenue per Internet user for 2018.

Social platform revenue is a result of content published by its users, which causes an interest from other users, that at its turn ends up in this users spending more time on the platform [6]. Value, created by content publication C on the online platform P is proportioned to people attention quantity and in general can be calculated as:

$$Value_c = AttentionShare_c Rev_p, \quad (1)$$

where $Value_c$ is the value of content C, Rev_p is the revenue of platform P for a period t, and $AttentionShare_c$ is the content C share of total attention, produced on platform P for a period t.

Granted that the majority of public content in social media is created by 15% of the most active users [7], it is possible to estimate the yearly content value per one publisher as \$150. Whereas a significant part of the value is created, in particular, by the social media platforms itself, publishers are still seen to be the primary source of it. Nevertheless, the more significant part of social media has yet to create solutions aimed to reward users for the creation of quality content.

1.2. Known implementations on blockchain

Today we are aware of a few dozens of projects, aimed to monetize content value and reward publishers using blockchain. All known models can be divided into two groups: self-decentralized social platform and overlay solution for existing social platforms.

1.2.1. Decentralized social platforms

Solutions of this group are oriented to create new decentralized platform instead of existing popular social networks such as Facebook, Twitter and the rest. Steemit was one of the first projects built after this model. The idea of a decentralized platform is to save every user's

action in blockchain (content publication, comments, likes, reposts, etc.), which allows to create an open system of ranking users and their content.

Strengths:

- the open ranking system allows to estimate value automatically and convert it directly into platform tokens, and, at the same time, it gives users a possibility to encourage other content publishers;
- absence of censorship.

Weaknesses:

- the problem of user ratings initialisation. Regarding that the newly-created decentralized platform does not have any content, the first ever users of the platform can significantly cheat with their ranks. Therefore, it will result in this users to get unfairly high rewards lately, and other users rank growth to be limited.
- the network effect issue and critical mass growth [8][9]. Popular social media exist for about ten years, and, consequently, show a strong network effect and formed UX. New decentralized platforms struggle to compete for the audience against Facebook or Twitter.

1.2.2. Overlay solutions for existing social platforms

Instead of creating own content publishing platform, overlay solution implies the creation of a decentralized application (dApp) to monetize value of content, published on existing social media.

One of the first overlay solutions was Reddcoin which positioned itself as a social cryptocurrency. Reddcoin offers its users to send donations to the publisher of the content they like in order to support this publisher.

Also, Brave should be mentioned — the browser, which estimates user attention time and rewards content publishers in proportion to the content viewing duration.

Strengths:

- publishers can receive rewards by creating content on social media platforms they are used to;
- content consumers can use economic influence directly on publishers through transparent blockchain mechanism.

Weaknesses:

- a content reward can be received only from people who installed a browser extension or mobile/desktop application or both;
- a content reward does not depend on social platform native KPI's such as likes, comments, retweets and so on;
- poor application usability, paid account registration [10] and other barriers to entry for new users.

2. Economics of social Interactions

2.1. Snax principles

As a solution to content value monetization issue Snax offers a blockchain-based social token, based on the following principles:

1. Social token priority is to save accumulated UX and existing network effects.
2. Account registration and transactions on blockchain should be instant and free.
3. Early registration of user is not a premise for any future preferences.
4. For token functioning as a digital social currency, its nature and application should be easily understandable for an average Internet user.
5. For the creation of an economically stable tokenized ecosystem, a commercial company should be granted a smooth integration into the blockchain platform.

2.2. Overlay solution on blockchain

On the basis of principle #1, Snax is on the way to create an overlay solution on the blockchain, which will be organically embedded in the existing social media ecosystem. At the same time, users do not have to change their experience of using social media platforms. SNAX tokens can be paid to any person, who creates content on social media oriented on publicity such as Twitter, Instagram, Reddit, etc.

SNAX is the basic utility token of its blockchain platform. Snax blockchain is based on EOS — popular open-source blockchain engine with DPOS consensus algorithm [11], but with free account registration, which allows Snax to implement principle #2 completely.

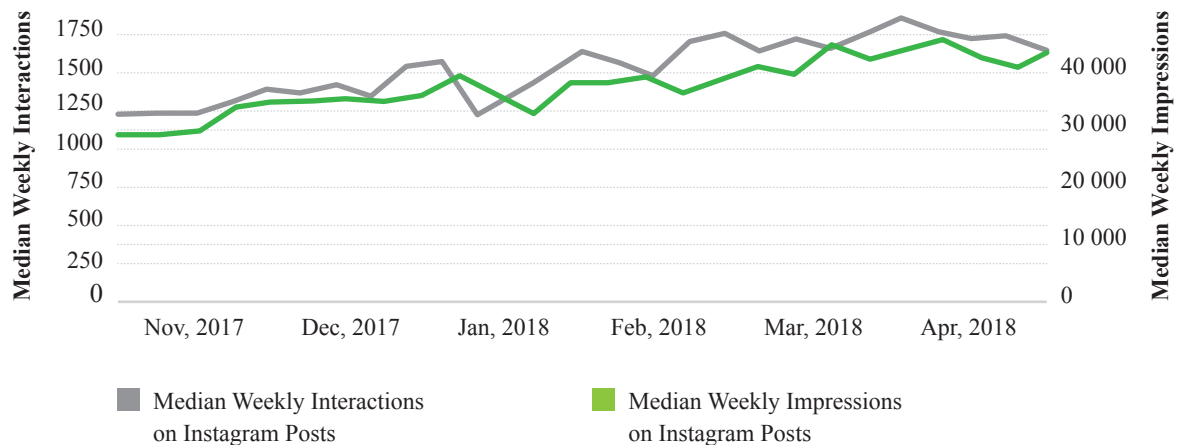
2.3. Value of Interactions

To calculate the content value (1), it is necessary to evaluate the share of all platform attention, which has been caused by this content. There is a well-known metric called Engagement Rate [12][13], which helps to measure content impact. Engagement Rate of content C can be calculated by the following formula:

$$ER_C = \frac{Interactions_C}{Reach_C}, \quad (2)$$

where ER_C — Engagement Rate of content C, $Interactions_C$ counts native metrics of content C such as likes, retweets, comments, etc., and $Reach_C$ represents the number of individuals who has been exposed to the content C.

Engagement Rate allows to estimate the amount of attention accumulated by some content. However, Snax as an overlay solution does not have access to the internal social media statistics for $Reach_C$ calculation.



Source: Socialbakers data
 Data Range: Oct 16, 2017 0 Apr 22, 2018
 Sample: 467 Instagram Brand Profiles

Studies [14], [15], [16] indicate that Reach of content is positively correlated with the count of content's Interactions. Therefore Snax introduces new concepts based on social interaction to estimate attention share of content.

Interaction Level (IL) — aggregated value of all social KPIs of the content for some period. The higher IL of content is the higher engagement this content has.

Account Weight (AW) — reflects the social impact of the account. AW changes over time and depends on activity, age and connections of an account on the social graph [17].

Followers Weight (FW) — displays an amount and influence of the audience who has the potential to get direct exposure to the posted content. Account Weights of the audience are taken into consideration when measuring FW.

Attention Rate (AR) — reflects total attention rate, accumulated by the content for some period.

Then, Attention Share of the content C can be calculated by the following formula:

$$AttentionShare_C = \frac{AR_C}{\sum_{i=1}^n AR_i}, \quad (3)$$

where AR_i is the Attention Rate of content i , calculated over the period t , and n is the total amount of the platform's content received any Interactions over the period t .

$$AR_C = IL_C FW_C, \quad (4)$$

where IL_C — Interaction Level of content C, calculated for the period t , and FW_C — Followers Weight of content C.

To calculate IL Snax uses all social interaction KPIs, provided by a social platform. For instance, for the content, published on Twitter, Snax takes into consideration likes, retweets and comments. Every KPI has its weight, calculated statistically for every account. A weight of KPI also depends on Account Weight of publisher.

Then Interaction Level of content C can be expressed as:

$$IL_C = \prod_{i=1}^k (W_i K_i), \quad (5)$$

where W_i — weight of KPI i for publisher of content C, K_i — total hits of KPI i for content C, k — total count of interaction KPIs on social platform.

Followers Weight is calculated as a sum of Account Weights of publisher's followers and accounts, engaged by his content:

$$FW_C = \sum_{i=1}^a AW_i, \quad (6)$$

where AW_i — weight of account i , a — total count of the accounts who has potential to get direct exposure to the posted content.

3. Token

3.1. Economy

SNAX is a utility token, which provides users with access to Snax economy, and is based on rewarding active and influential users on public social platforms. Users can transfer SNAX tokens to each other, stake SNAX to vote for block producers and buy computing resources for dApps. Any user has three main ways to earn Snax tokens:

1. Receive Regular Publisher Rewards.
2. Receive donations from other users willing to support the author of the interesting content.
3. To be elected as a Block Producer and receive Block Producer Rewards.

3.1.1. Regular Publisher Rewards

In total 100 000 000 000 of SNAX will be produced in the 1st stage of the supply emission. Users of public social platforms and Snax block producers will receive 84% of that 100 billion. After 100 billion of SNAX will be produced, no more than 1 billion of SNAX will be added to Regular Publisher Rewards every year in the 2nd stage of the supply emission.

The algorithm of receiving regular publisher reward for a user of a social platform is the following:

1. Register a free account on Snax
2. Confirmation of your rights to the account on a social platform and bind this account to your Snax account.
3. Receive SNAX tokens automatically at the end of every Scoring Round (look below).

Regular Publisher Rewards system motivates popular content creators and influencers to engage constantly with Snax economy.

3.1.2. Block Producers Rewards

Snax network produces 1 block every 0,5 seconds. Total reward for one produced block in the 1st stage of the supply emission is calculated as:

$$TBPR_t = \begin{cases} 0,000000001(TS - CT_t), & CT_t < 84145200000, \\ 15,8548, & \end{cases} \quad (7)$$

where $TBPR_t$ — Total Block Producers Reward, charging at the moment of time t ;
 TS — total supply of SNAX tokens in the 1st stage of the supply emission: 100 000 000 000;
 CT_t — total circulating SNAX tokens at the moment of time t .

After about 84 billion of SNAX will be produced, 1 billion of SNAX approximately will be added to Block Producers Rewards every year, which is 15,8548 SNAX per 1 block.

Total Block Producers Reward is divided into 2 equal parts. 50% of the TBPR pay goes to active producers and 50% goes to standby producers calculated from a percentage of the votes received.

Thus, the total yearly inflation rate of SNAX tokens will be approximately 2% after the 1st stage of the supply emission finished (1 billion for Regular Publisher Rewards + 1 billion for Total Block Producers Rewards). Furthermore, the inflation rate will slowly decrease, as 2 billions of added SNAX tokens per year are constant.

3.1.3. SNAX supply

The issuance of SNAX is carried out in a determined way under Scoring Rounds.

Scoring Round Time (SRT) — the period when Snax collects and process all content published on a platform: new posts, comments, likes, reposts and other Interactions. Every social platform has its personal Scoring Round Time, which depends on the amount of content, published on the platform per unit of time, and the audience of the platform.

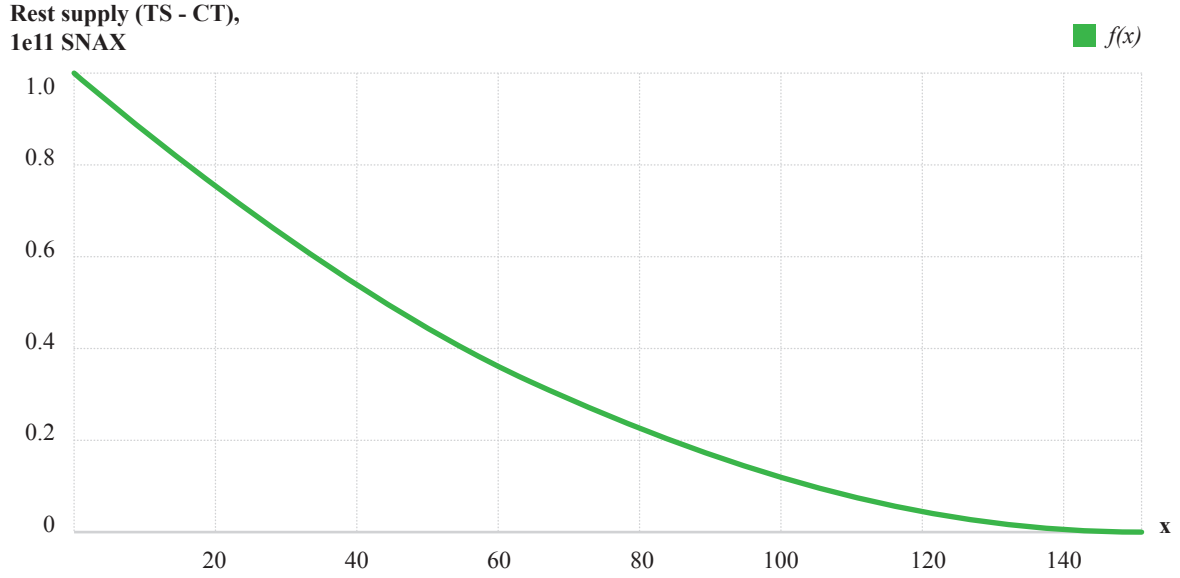
Total Round Supply (RS) — the maximum amount of tokens issued at some period for all platforms integrated into Snax. Round Supply is a difference between two points of the parabola defining the general rule of the issuance of SNAX tokens.

$$TRS_t = TS - CT_t - f(x_t + \delta_t), \quad (8)$$

where TRS_t — Total Round Supply at the moment of time t , TS — total supply of SNAX tokens in the 1st stage of the supply emission: 100 000 000 000, CT_t — total circulating

SNAX tokens at the moment of time t , $f(x)$ — general rule of the issuance of SNAX tokens:

$$f(x) = 4385772x^2 - 1324503311x + 100000000000, \quad (9)$$



$$x_t = x_{t-1} + \delta_{t-1}, \quad (10)$$

$$\delta_t = \begin{cases} \max\{SRT_1, \dots, SRT_i, \dots, SRT_p\}, & \text{if } \forall (x_t + SRT_i) < -\frac{b}{2a}, \\ -\frac{b}{2a}, & \text{if } \exists SRT_i : x_t + SRT_i \geq -\frac{b}{2a}, \end{cases} \quad (11)$$

where SRT_i — Scoring Round Time of platform i , p — total count of platforms, integrated into Snax.

Platform Supply Share (PSS) — a number between 0 and 1, reflecting the share of Round Supply to be distributed between users of the platform as a reward.

$$\sum_{i=1}^p PSS_i = 1, \quad (12)$$

where PSS_i — supply share of platform i , p — total count of platforms, integrated into Snax.

Then the value of content C created between a moment of time t and the moment of publication of this content on social platform i, can be calculated in SNAX tokens through (1):

$$Value_c = \frac{AR_c}{\sum_{j=1}^n AR_j} PSS_i TRS_t \frac{SRT_i}{\max\{SRT\}}, \quad (13)$$

where $Value_c$ — value of content C and a publisher reward for this content, based on people Interactions with C over Scoring Round Time period.

SNAX tokens will be issued in the total amount of $Value_c$ at the end of the Scoring Round if the following conditions apply:

1. Content C was created by publisher, registered in Snax.
2. Content C was published not earlier than 7 days ago.

3.1.4. SNAX utility

Transactions between accounts on Snax network are entirely free. Total available daily number of transactions for account depends on how much SNAX tokens was staked on this account. If a user needs to raise his transactions limit, he should stake more SNAX tokens on his account.

This is the primary utility of SNAX tokens, few other ways to use SNAX tokens are described below.

3.1.5. Donations

Any Snax user can donate to any account of the social platform integrated into Snax. The recipient does not have to be registered on Snax to be donated, but they should register to claim the donation. Links to media content can accompany donations: images, GIFs, videos. Also, donations can be sent as a virtual collectable gift, created with NFT [18].

3.1.6. Social dApps

As account registration and direct transactions are free on Snax network, developers can easily create dApps on Snax platform. The most beneficial areas for Snax dApps are social applications: games or mobile apps, integrated with some social platform. Developers of Snax dApps receive direct access to Social Transactions mechanism, so they do not have to think about the connection of accounts on social platforms with blockchain.

3.1.7. Social media marketing

Commercial companies can be involved in Snax economy in a few ways:

1. Cooperate with influencers.

A company can pay for a commercial article or series of posts or mentions of the brand on publisher's blog. Wherein the smart contract is the guarantor of the deal. It can completely control the fact of publishing paid content and its presence on the blog further on. Basically, such smart contract is an implementation of native advertising market on the blockchain.

2. Organize social media marketing campaigns using dApps and NFT.

For instance, simple promo-event: a company wants to reward every tenth follower for a repost of some promo-content. To implement this event, it is possible to create a simple Snax dApp, which will automatically calculate reposts and send winners gift certificates as an NFT for goods or services of the company. The company will treat NFT as a confirmation of the right to a gift. The blockchain will guarantee trust on every stage of the event, and a company will be able to run a promo dApp through a convenient Snax UI without programming.

3.2. Technology

Snax blockchain uses DPOS consensus. Nonetheless, Snax has a different perspective on a few basic blockchain ideas: account registration, computing resources management and initial coin offering. Snax also pays much attention to create the user-friendly interface to cover every stage of using blockchain. Its primary priority is to provide the ease of using blockchain for an average Internet user.

3.2.1. Free accounts and zero cost transactions

Registration of an account on DPOS blockchains usually requires to stake basic platform tokens for RAM, CPU, and NET usage. To free users from buying tokens during the process of registration, Snax conducts a pre-mine (see "Snax launch") to stake own tokens to create new accounts. So, since Snax stakes basic tokens on user accounts itself, direct transactions on Snax network becomes completely free. Despite apparent benefits for users, free registration removes economic obstacles for launching and scaling of dApps.

3.2.2. Fair RAM market for dApps

The concept of RAM market is inevitable for maintaining a stable work and scaling of blockchain. It is crucial to implement a proper operation of this market to provide fair RAM price to protect dApps developers from market speculations. For instance, RAM purchase is the most significant part of EOS dApps expenses as they have to register new accounts themselves in most cases, and RAM price on EOS network rose up 5000% in summer 2018 [19].

From Snax's perspective, it is necessary to differentiate the way user access resources regarding the way of use:

- to create new accounts (RAM is provided on the Snax expense);
- to carry out a transaction (RAM, CPU, NET is provided on the Snax expense);
- to use in dApps directly (by market pricing mechanisms of Bancor Relay [20]).

3.2.3. Social Transactions

Social Transactions mechanism provides a possibility for any user to send SNAX tokens to any account on a social platform, integrated into Snax. Snax.system smart contract has a list of platforms each of which has its own Platform Share Supply. Adding of new social platforms and changing of Platform Share Supply is adopted by voting of Snax block producers. For integration of a new social platform into Snax, a separate smart contract will be created. This contract is operated by a particular system account, which distributes Regular Publisher Rewards. The contract stores a map between the id of an account on a social platform and the account on Snax. For instance, to bind an account on Twitter with an account on Snax, a user must publish a particular tweet under this account to prove the ownership of it. Snax can also support an OAuth mechanism to verify the ownership of some social media account.

A significant part of Social Transactions mechanism is an opportunity to send tokens to an account whose owner has not registered on Snax yet. In this case, the transaction goes to the credit account of the Snax smart contract. If the owner of the recipient account registers on Snax, then smart contract immediately sends him tokens from his credit account. Social Transactions are of zero-cost for users.

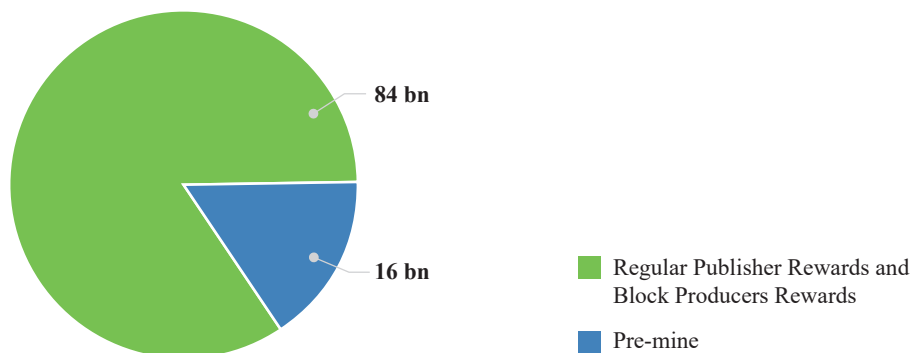
3.2.4. Platform Inbound Oracles

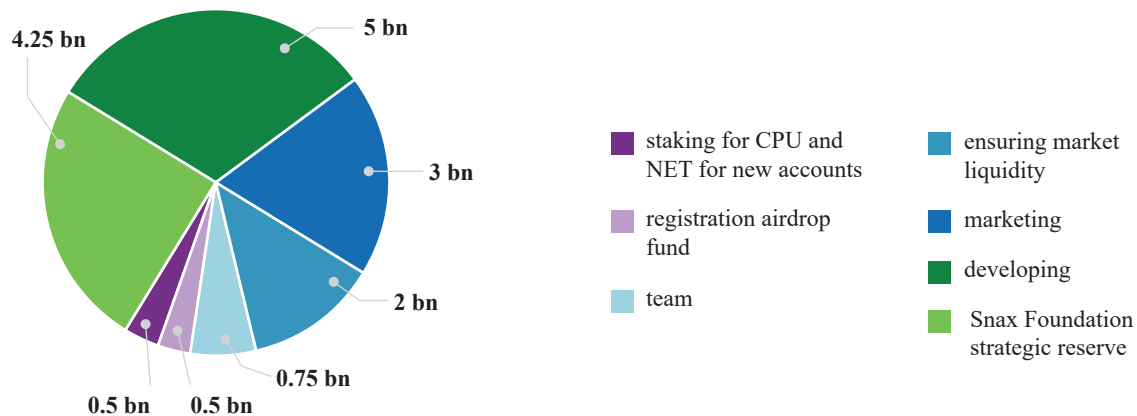
Smart contract of every platform must have own Inbound Oracle, responsible for collecting data and adding it to blockchain during the Scoring Round. Inbound Oracle is crucial for calculating Regular Publisher Rewards because the overlay solution cannot exist as a deterministic system since data of third-party social platforms is changing constantly. Nevertheless, the methodology of calculating content value (13) makes it possible to use Inbound Oracle and obtain results close to deterministic. Using the Monte Carlo method shows that the distribution of SNAX supply approaches specified Platform Supply Shares in long-term within a relative error of no more than 5% independently from Scoring Round Time of each platform.

4. Snax launch

As it was mentioned earlier, Snax Foundation will conduct a partial pre-mine of SNAX tokens instead of selling it during the ICO. Rest part of tokens will be mined by Snax users as a Regular Publisher Reward. This way of launch provides a fair tokens distribution, based on the social influence of users.

4.1. Token distribution





4.2. Registration airdrop

Registration airdrop fund will be created on the launch of the Snax mainnet. Airdrop is to be given to the new users, who bind their Snax account and account on a social network integrated into Snax (only Twitter will be supported after the launch). Registration airdrop is aimed to let the users, who are not successful publishers, to participate in Snax economy (e.g. to send donations).

4.3. Pre-mine effect decreasing

4.3.1. Escrow smart contract

All of the team, marketing, developing and reserved tokens will be sent to a particular system escrow smart contract, where they will be divided into 10 parts. Every part expires in half a year after the previous one, and the first one expires in 48 hours after transaction creation. Tokens, kept on escrow contract, can participate in voting and delegating, but cannot be released from escrow contract before it expires. Escrow contract allows Snax Foundation to control SNAX liquidity transparently and predictably.

4.3.2. Reducing of Snax Foundation votes

Snax uses DPOS consensus. It is necessary to distribute tokens between a large number of users to provide a fair mechanism for choosing block producers. The more users are involved in the voting process, the more equitable the result is. Elections process in the start

of the Snax network will have no effect, if all pre-mined tokens will be used for voting. To make transition to democracy smooth in the beginning, weight of Snax Foundation votes will be reduced by the following table:

Producer number	Escrow vote multiplier	Snax Foundation votes weight
1	1,0000000000000000	15 000 000 000,00
2	0,9000000000000000	13 500 000 000,00
3	0,8000000000000000	12 000 000 000,00
4	0,7000000000000000	10 500 000 000,00
5	0,5500000000000000	8 250 000 000,00
6	0,4000000000000000	6 000 000 000,00
7	0,2500000000000000	3 750 000 000,00
8	0,1000000000000000	1 500 000 000,00
9	0,0500000000000000	750 000 000,00
10	0,0250000000000000	375 000 000,00
11	0,0125000000000000	187 500 000,00
12	0,0062500000000000	93 750 000,00
13	0,0031250000000000	46 875 000,00
14	0,0015625000000000	23 437 500,00
15	0,0007812500000000	11 718 750,00
16	0,0003906250000000	5 859 375,00
17	0,0001953125000000	2 929 687,50
18	0,0000976562500000	1 464 843,75
19	0,0000488281250000	732 421,88
20	0,0000244140625000	366 210,94
21	0,0000122070312500	183 105,47
22	0,0000061035156300	91 552,73
23	0,0000024414062500	36 621,09
24	0,0000024414062500	36 621,09
25	0,0000024414062500	36 621,09
26	0,0000024414062500	36 621,09
27	0,0000024414062500	36 621,09
28	0,0000024414062500	36 621,09
29	0,0000024414062500	36 621,09
30	0,0000024414062500	36 621,09

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