DeFiCON: ICON Decentralized Finance

Contribution proposal by iCONsolidation

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Contents

Abstract

ICONsolidation is the ICON network Public Representative actively involved in securing the network and representing the community in the ICON network governance. In this paper, we will try to explain the weak points of the current governance model and try to introduce a solution that will try to improve the decentralization of the votes and stimulate the community and the teams to work on increasing the value of the ICON network.

The current stake and reward distribution model need to be revisited as it relates more to the traditional Proof of Stake (POS) or Delegated Proof of Stake (DPoS) rather than the intended Delegated Proof of Contribution (DPoC) governance model. The ICON Incentives Scoring System (IISS) needs to be adjusted to reflect the current state of the ecosystem and further improve the incentive to actively engage all the ecosystem participants in the network expansion.

The project will be represented in the two categories, development and community activities. With the main focus on the financial governance irony, the project will be developed under the name of Deficon.

> *Deficon—A neoconservative who claims to be dedicated to preventing wasteful budget spending, but only ends up increasing the Nation's debt. They also tend to like cutting social programs for the poor to give the rich a free ride.*
>
> Deficon. (n.d.). In *Urban Dictionary.* Retrieved from the Urban Dictionary

1. Introduction

Over the years the blockchain technology and its application have grown and new blockchains with different consensus algorithms were created. Proof of Work (PoW) is the first and currently most popular consensus algorithm for blockchain applications where miner needs to solve a series of cryptographic puzzles to create a new block. Proof of Stake (PoS) consensus algorithm was created as an alternative to PoW where the creator of the next block is chosen according to how many coins he stakes (holds). The Delegated Proof of Stake (DPoS) is the further evolution of PoS where a democratic governance model is introduced with the implementation of technology-based democracy with all relevant voting and election processes.

All of the mentioned consensus algorithms were developed to improve the weak areas of the former models they were based on. ICON did the same by introducing the Delegated Proof of Contribution (DPoC) consensus algorithm which was designed to improve the DPoS centralization and passive community problems.

> *"ICON has improved the existing 'Delegated Proof of Stake (DPoS)' to prove various items related to network activity, such as smart contract executions and proof of stake. This is measured by using the 'Delegated Proof of Contribution (DPoC)' consensus algorithm based on the ICON Incentives Scoring System (IISS).*
>
> *To determine a reliable representative, the ICON Network evaluates all participants according to their contribution to the network and quantifies them. Given a fair assessment of their respective contribution and the corresponding rewards, participants will develop and propagate the ecosystem, ultimately increasing its value. Participants with sufficient contribution can be judged to be credible and may be selected as a representative. In the same vein, reliability can be proven by receiving delegated contributions from other participants. The delegated contribution is an indicator that the participants are trusted.*
>
> *The central philosophy of the ICON Network reward distribution is fair compensation based on relative contribution. Each participant can demonstrate their contribution through the ICON Network's unique contribution evaluation system. In the end, the contribution is the most important value shared within the ICON Network and therefore will be the sole standard in the network. Delegated Proof of Contribution (DPoC), as described herein, is the sole justification for electing representatives."*
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> *ICON Foundation 2018, ICON Yellowpaper - ICONstitution and Governance*
> *ICON Foundation 2019, ICON Decentralized Autonomous Governance System*

The current stake and reward distribution model need to be revisited as it relates more to the traditional Proof of Stake (POS) or Delegated Proof of Stake (DPoS) rather than the intended Delegated Proof of Contribution (DPoC) governance model. For the various reasons that will be addressed later in the paper, the Proof of Contribution is showing characteristics of a rather restrictive model where reward/return rates are favoring the 'lazy' nodes.

There is a positive initiative from the community to address the staking distribution problem. While there are some truly interesting approaches, we believe none of these solutions are strong enough to tackle a complex problem like this. One of the reasons lies in the fact that almost all initiatives start and end as an isolated effort. For the same reason, we propose that the problem is addressed in a more professional and a permanent form.

In this paper, we are proposing an improvement to the current Delegated Proof of Contribution (DPoC) reward distribution model. Paper will provide an insight into all ecosystem participants, practices in the place and interactions between them. The different incentives will be analyzed and presented with their goals to improve the existing governance model.

2. DeFiCON project plan

DeFiCON is split into the six stages of project planning, starting with the initial Project idea phase where imperfections of the current DPoC model and all related subjects were observed. The idea to propose a better and more decentralized solution for the ICON ecosystem was formed.

The true beginning of the project came with Phase 1 or the Initiation phase. The main objective was to transform the idea into the initiative with defined objectives. Contribution proposal with a detailed project plan, the scope of the required research and key performance indicators were written. DeFiCON was officially announced as an ICON community forum contribution proposal:

https://forum.icon.community/t/contribution-proposal-deficon-icon-decentralized-finance/376

The initial objective of the contribution proposal was to get support from ICON Foundation through a community grant program to deliver the objectives from the proposal and to transition the project from the Intention to the Project form.

In just a week since we broadcasted our proposal, the feedback and opinion from the community and the P-Reps were fantastic. We did not only manage to get support for the proposed funding, but support was so overwhelming that we received the full funding to deliver the DeFiCON proposal. This came as a clear sign that the community sentiment is aligned with the points we brought in our proposal and the vision we have for fairer and stimulating ICON governance.

Since we got fully backed by the community, the ICON Foundation stimulation proposal was withdrawn and the project became a community funded project.

We are proud that in such an early stage DeFiCON already won a major achievement, **a 1st community-funded proposal on the ICON network**.

3. ICON Ecosystem - ICONists

The ICON ecosystem participants (ICONists) are considered to be network stakeholders and they are divided into the following groups:

- ICON Foundation
- Public Representative nodes (P-Reps)
- Voters
- Others (contributors)

All the participants are interconnected, meaning they are interacting with each other on different levels and at the same time they are dependent on each other. This connection is very important because it reflects our opinion that a problem cannot be solved unless solutions for participants are presented.

ICON Foundation oversees the ICON project's core activities which include the promotion and development of the ICON protocol. A week after our proposal was submitted, Foundation started a community discussion by introducing governance and the ICON Incentives Scoring System (IISS) improvement points. The majority of the given points are directly aligned to the topics introduced in our DeFiCON proposal and they will be described in more detail in the relevant chapters. One month after an official IISS 3.0 improvement points were announced introducing the improvement we already worked on. It was decided that our scope of the work will be expanded and that proposed improvements will also be described in this paper.

Foundation interacts with P-Reps regarding the governance and network proposals, development and community services. The grant proposal fund is still centralized and under the Foundation control and is a place where all participants can interact to get funding to develop their ideas. This is a valuable part of the network and should be deployed in a way to serve as a network balance system.

3.1 Public Representative Nodes (P-Reps)

Public Representative nodes are the basis of a sustainable and secure network. They are producing blocks and verify transactions on the ICON Network and they are acting as the main delegates of the decentralized governance system. P-Reps are ranked based on the number of votes they get from the voters. A positive competition needs to be accomplished between the P-Reps in the stimulating ecosystem.

In the current ecosystem, 100 P-Reps are receiving the P-Rep reward, where the top 22 are the Main P-Reps and the other 78 Sub P-Reps. Besides the normal P-Rep reward B2, main P-Reps are receiving an additional block producing reward B1 and they have a bigger influence in the governance. All of P-Reps can be divided into two activity groups regardless of their rank and number of votes.

3.1.1 The ‘Lazy’ nodes

The first group consists of the P-Reps that are displaying mostly passive characteristics which we will call the ‘Lazy node’ group. The motivation and transparency of the team running the node are not known as there is little or no communication from their team members. No information about development plans or any similar activity is presented which makes hard to evaluate

them on a factual basis. The only possible evaluation of these nodes is by comparing them to the node behavior observed in the similar DPoS projects.

The lazy node is a P-Rep that is feeding on the node rewards with little or limited value returned to the network besides providing basic node functions. They can be divided into the following groups based on how the node rewards are distributed:

- Self-staking nodes
- Staking as service nodes
- Self-staking service nodes

Self-staking nodes are ICONist(s) whose investment in ICX is big enough that they are running their nodes to get an additional reward on their ICX capital. These P-Reps are rarely selling their node rewards. They are restaking most of their rewards intending to increase their staking capital. The rare reward selling occasions are related only to monthly node operation costs. These kinds of nodes can be classified as positive passive nodes. Their passive contribution can be justified by the positive re-staking incentive that helps the network by reducing the circulating amount of ICX and displaying the long commitment intention of the stakeholder.

Staking as service nodes represent traditional staking service nodes where the node operators are running the node and sharing the node rewards to the users that are using their services. Staking as service P-Rep teams are keeping the percentage of the reward as the fee for their service. The most common activity of these nodes can be seen in a daily/weekly reward distribution transactions. They are distributing the rewards to the users either directly to their accounts or through the exchange wallets to mask the origin of the funds. This kind of P-Rep behavior is not allowed and it can be classified as a vote-buying service. In the current system, this kind of behavior may be obvious but it is hard to prove it unless an insider staking service user delivers the on-the-chain proof. There is not much that can be done to efficiently stop this without starting the witch hunt that can divide the ecosystem and make more damage to the entire ecosystem.

A Self-staking service node is a combination of the two previously described nodes, a self-staking node with additional staking as a service operation. They are primarily P-Rep teams whose initial capital is not matching their ambition and are looking to increase their staking income by being involved in a disallowed vote-buying activity. As it is the same case with the Staking as service nodes, it is hard to prove and efficiently stop this type of node behavior.

The self-staking nodes that are seen as the passive positive network participants represent the only lazy node entity that has a certain potential to leave its comfort zone and more actively participate in the governance. Due to their passive nature, only a small portion of these nodes will react proactively to the stimulation efforts. The majority will tend to stay passive unless they are stressed with the self-preservation call when their node comes to the danger zone of losing rewards (falling out of top 22 or top 100 ranks). ICON P-Rep network expansion with an increased amount of P-Reps (140+)is probably the required threshold for activation of these P-Reps. Because of the passivity, we will not further target this group but will rather leave them for now to the side effect of the network growth.

3.1.2 Active nodes

The P-Rep teams that are actively contributing to the ICON network are called the active nodes. The type of contribution P-Reps are providing is different for each of the teams. The difference between the P-Reps is healthy for the ecosystem as the different P-Rep activities are promoting the wider impact and adoption of the ICON network.

To evaluate contribution, the P-Reps and their contribution need to be distributed in the different categories:

- Development
- Infrastructure
- Education
- Community/Social media
- Marketing

At the moment the majority of the active P-Reps are contributing to the network in one of the noted categories. Only a few of the main P-Reps with multiple team members are ready to expand and to contribute in 2 or 3 categories. The majority of the P-Reps at the moment are falling into the single contribution category with occasional attempts into another one. The contribution value presented to the voters is disproportional and in the big favor of the Community/Social media focused P-Reps only because it falls into their main working domain. It does seem that the teams that are focused on other as important categories like development are falling behind, just because of their focus on development and not on the social media and community outreach. This makes the distribution of the remaining 20% of the active voters even more centralized.

3.2 Voters

Voters are Iconists that are staking and delegating their votes to the P-Reps. One of the downfalls of the classic DPoS system is the community apathy where it is a common thing that the community is staking their coins with delegates that are promising the best rate of investment ratio. Once the perfect delegate is found, staker interaction with the project or its governance is minimal. Delegates and their stakers will stay in symbiosis as long both parties are enjoying the benefits of it. In the long term, this approach is not good for the project as the community has no incentive to more actively influence network growth.

To tackle the community inactivity, ICON proposed an improved version of DPoS where stakers can't only stake but are also required to vote to receive the staking rewards. Dividing the staking and voting process is an important part of the governance ensuring that staking as dividend yield process is independent of the network governance process.

ICON Delegated Proof of Contribution is designed that the voters can delegate their votes to the representatives they believe are providing the most contribution to the network. While the voting process was intended to more actively involve the community into the network governance, the behavior of the community seems to follow the typical DPoS principles. We are glad that the problem is recognized and that besides our initiative, the Foundation also acknowledged the need to improve the voter's incentive and are working on IISS improvements.

3.2.1 Lazy voters

Lazy voters represent the majority of the votes. They are following the typical DPoS staking pattern where no interaction with the project or the delegates is intended. This group of voters is following the less active pattern of claiming the I_score every week or even less often. They are not following much of the progress of the team or the network as they are the only incentive is financial, the staking dividend yield.

We believe these voters are distributing their votes based on Proof of good intention. Because they don't have time themselves to look for the PoC factors, they follow the thought that the

community already researched them and that the P-Rep list corresponds to the real contribution value. This would work perfectly if this group does not represent the majority by a huge difference. Instead of adding to the contribution value, they are the main reason for the bigger centralization of the votes where the first movers are ripping rewards based on that fact.

This group of voters needs to be readdressed and more actively involved in the governance processes. We believe they are the main drive that produces lazy nodes. After all, we are all humans. If you choose between doing little or nothing and rip the 80% of the rewards or have a full-time job for 100% rewards, what would you choose?

3.2.2 Active Voters

In the current state of the network, we are assuming that around 20% of the total voters are active voters. The 20% came from our observation of the P-Rep big delegations and the frequency these voters are collecting rewards or changing their delegations. Active voters are the Iconists that are closely following the news around the Icon and actively participating in Icon social media channels. They are the ones that are actively searching and self-evaluating the Proof of Contribution of the P-Reps. They are delegating their votes according to the impression they receive about the contribution value of each of the teams.

It is most common for these voters to claim the I-Score at least every week and restake/revote the rewards. On every revote it a common thing to see that they are reshuffling the votes to follow the recent P-Rep contribution opinion. This group of the Iconists represents what an intended ecosystem voting participant should look like. The most common issue this group has is the lack of information or the amount of the sources that need to be checked to track different team progress.

4. ICON Incentives Scoring System (IISS) Bond

ICON Incentives Scoring System (IISS) is an evaluation system for the contributions of ICONists within the ICON Network. The ICON network governance is currently operating under the IISS 2.0 with the announced IISS 3.0 changes that are under the discussion. While the Bonds are not present in the current system, the idea already existed in similar DPoS projects.

Introducing the Bond to the ecosystem isstimulating governance variable that will improve the ecosystem for the following reasons:

- The P-Reps need to be accountable for network security and the infrastructure. In the reference to the global financial crisis of 2008 where banks were bailed out by the tax voter money, we believe a bond system needs to be in place so the P-Reps are sharing the penalty risk with the voters.
- Teams with a lot of votes are incentivized to buy/earn and hold a lot of ICX. This will have a positive effect on network security by increasing the % of network staked and it will also reduce inflation by reducing the staking rates. Taking the ICX out of circulation supply can have a positive impact on the price too.
- The bond system is another countermeasure against vote-buying and reward sharing. The bond requirement will drastically reduce the reward amount for the nodes that are serving purely as a staking service and taking the fees for distributing

the rewards to the stakers. This will either make this type of service unprofitable or it will reduce the voting power and the influence of the node.

- P-Reps will need to more actively participate in a Contribution proposal system and look for additional investments based on the planned project or activity. Active participation in the Proposal system will stimulate the teams to implement real-life business models and help them learn all the aspects of how to run a transparent and accountable company. The ultimate goal is that P-Rep grows into a self-sustainable business that is not dependant on ICON to pay for their salaries and living costs.
- P-Rep will need to self delegate portion of the reward to increase the treasury. This will directly decrease the selling pressure and promote bigger financial consciousness and accountability of the teams.
- For security purposes, a secondary wallet needs to be used.
- The Bond and Contribution proposal Fund requirements will bring a better self-financial control impacting the overspending on team salaries, running costs, and all other non-productive expenses
- the negative side of the bond is that it may increase the number of the lazy self-staking nodes to a certain extent (if the stake amount is going to keep them in the top 100)

The bond requirement has our support from the start. It is a great initiative to rule out a lot of potential bad actors from the game. We were supporting the higher bond requirement to provide extra stimulation for the P-Reps to go through the CPF to fund their projects. As mentioned before, we don't lack the funds, we are lacking good ideas and the projects.

4.1 IISS 2.5 Bond requirement

Our proposed bond proposal was based on the IISS 2.0 system. Since Foundation came out with IISS 3.0 proposal while we were in the middle with our work, this paragraph will be kept for information purposes if it ever comes to the point that IISS 3.0 measures need to be reconsidered. For this reason, the proposed changes will be addressed as an IISS 2.5 proposal.

In the IISS 2.0, the difference between the main and sub P-Rep rewards are in the block producing rewards B1. At the time of writing, the regular annual reward B2 for the top 100 P-Reps was ~12% of the vote amount. The annual block reward for the main 22 P-Reps was ~ 6% of the vote amount. We propose two different bond requirements depending on the type of P-Reps :

- 12% bond for Sub P-Rep means that Sub P-Rep is bonding around 12 months worth of the revenue generated.
- 18% for main P-Reps also equals to 12 months worth of the revenue generated with the additional block reward included in the revenue
- The strong bond requirement's main purpose is to redirect the P-Reps to participate in the CPF and deliver the projects in a transparent way.
- The bond % means that the P-Rep will need to stake and self vote % of the total votes to receive the maximum reward.

4.2 IISS 3.0 Bond requirement

ICON Foundation proposed Bond requirement in their IISS 3.0 enhancement forum discussion group:

Bond Requirement: *Many voters are scared of being burned and we think this is an issue. We also think it is an issue that many P-Reps have nothing at stake themselves and voters are taking all the risk of holding ICX. We believe P-Reps should be accountable for their actions and should also have "skin in the game". We are still deciding on the size of the bond requirement, but it will be a percentage of the total delegation received. This will also lower the advantage of vote-buying because P-Reps will need to post a larger bond as they get more votes. If they can't post the full bond they will not get full rewards. This will also incentivize P-Reps to not sell some of their ICX because they need to have it as a reserve to post a bond as they get more votes.*

We propose the following bond requirements:

- Since the IISS 3.0 proposal published by ICON Foundation during the mid-March is suggesting the removal of block generating reward B1 our double bond suggestion is not anymore valid. Directing the B1 block producing reward from the main P-Reps into the Contribution proposal fund is reducing the annual ROI of main P-Reps from ~18% to ~12%.
- To follow up on the changes, we are proposing a unique bond value for all the P-Reps of 9% which equals the average IISS 3.0 annual node reward (~12 months) for the top 50 nodes.
- The 9% bond value would equal to an average of 14 months of rewards for the top 22 P-Reps
- The 9% bond value would equal to an average of 10 months of rewards for the P-Reps ranked 23 to 100
- The difference in time required to accumulate the bond requirement is a small step to help decentralize the votes more by slowing down the growth difference between the P-Reps
- A decrease in node rewards caused by this measure needs to be reduced by increasing the I_rep values back to 50000 until the balance is achieved
- The 12-month bond requirement will create a strong incentive for the P-Reps to raise their treasury

The strongest opposition to the Bond requirement is the fear of the P-Reps that they will not have enough funds for the development as they will have to redirect the funds to the bonds. A better understanding of the CPF and an initiative to work with it is needed to realize a lack of funds is not a valid argument.

5. Contribution Proposal Fund (CPF)

Our strong belief is that a stimulation hub like the Contribution proposal system needs to be a backbone of the governance model that will provide balance to the ecosystem. To make the system effective, a community fund will keep the funds and distribute them to contributors to

promote and develop the approved projects. The same system will be a measure of contribution where proactive proposal owners will be rewarded upon delivery of the project objectives.

> *Issues that have become apparent include vote-buying attempts, excessive competition leading to emotionally charged infighting and instability in the social media communities, excessive advertising/self-promotion in the public channels, a lack of clear incentives to collaborate vs. compete, and a lack of direct rewards for direct contributions.*

The Contribution proposal system needs to provide and guard a healthy and honest competition between the P-Reps. If a team proposes a project through the system than the project and idea should be bound to the proposer team until certain conditions are met.

5.1 Contribution proposal grant - IISS 2.0

In November 2019, Foundation established an off-chain community Grant category where Foundation and P-Reps can use the rewards to fund the development of the network. The offchain solution is the first step before a more decentralized solution is produced. ICONists can submit a contribution proposal request to receive the funds to work on specific projects. This grant is based on the goodwill of P-Reps to share a portion of their rewards or as in the majority of cases, the willingness of Foundation to fund the projects.

When applying for the funds to write this paper, we were looking to try the different funding approaches. Instead of the usual contribution proposal lump sum investments that are having a direct impact on the treasury, we tried to test the stimulation option where the funds are not directly spent but rather deployed as an intended stimulation fund. Our original stimulation proposal is described as the following:

> *''All of our work that leads to this paper is self-funded. For further development, we want to stay budget responsible by spending our funds. All previous contribution proposals were based on the lump sum investment from the ICON Foundation. As a part of our DeFiCON solution, we are proposing a different approach to the funding.*
>
> ***Stimulation proposal***
>
> *Our proposal for ICON Foundation is to stimulate our project by supporting proposal owner P-Rep iCONsolidation with* ***300 000 unused Foundation votes for a minimum period of 30 days****:*
>
> - *iCONsolidation will earn around 3500 ICX (~1400 $) over 30 days from the extra votes*
>
> *Benefits:*
>
> - *The actual cost of ICON Foundation—0 ICX*
> - *Strong budget control, ICON Foundation has full control of votes and can withdraw them as soon as project diverts from the plan*
> - *The incentive for the proposal owner to develop a strong and financially sustainable project plan*
> - *The incentive for proposal owner to report progress and KPIs*
> - *Opportunity to deploy unused Foundation votes''*

The main benefit of the stimulation funding instead of lump-sum funding is hidden in the DPoC intended design, to stimulate the large majority of the 'lazy' voters.

The lump-sum investment is usually resulting in the proposal owner selling the funds and at the same time, it has a direct effect on the Community treasure decrease. The P-Rep that receives the funds are focusing on the project and very little of the proposed contribution is transferred to the community. The community can easily misinterpret the lack of communication and start to put the P-Rep in the lazy node group. For this reason, the P-Rep increased contribution can be counter-productive, instead of getting the increased notion they may suffer the loss of the voter's support.

On the other hand, the stimulation proposal funding is showing a significant improvement for the DPoC model:

- it is used as a more accountable and self-sustainable way of keeping the Community treasury fund level at the product level. This means that the treasury is not going to experience a problem where overfunding of the single project can drain the treasury and prevent future funding.
- Full control of the funds is bringing a dynamic budget control where funding amounts can be adjusted between different projects at any given time, depending on the project goals and KPIs delivered.
- Indirect stimulation – besides the treasury votes, the increased amount of votes will put the proposal owner closer to the look of the lazy voters. The higher P-Rep position or short time increase in the votes will attract some of the passive voters following the flow.
- Indirect decentralization - The longer the proposal owner teams are exposed with the stimulation votes, the bigger the chance to attract an increased number of the passive votes. Once the passive votes move it is most likely they will follow the same behavior and follow the new team for a long time.

Over time, we were receiving the stimulation, we observed that an increased amount of votes and higher P-Rep rank did influence the passive income of the votes. While we believe the majority of the extra votes came from the active voters who followed our activities, the certain increase in the votes during the quiet social activity indicates a certain percentage of votes came from the "lazy" voters who just followed the increased rank.

During the period we received around 150 000 extra votes from the community. While we can directly relate to 100 000 votes that came from the voters who directly supported our activities, there are still around 50 000 votes that we can't directly relate to. Having in mind the current state of the community and the voters, we still believe that a majority of the extra votes came from the active voters that are following the activities around the ICON but prefer to stay quiet in the social channels.

As for the conclusion of the stimulation funding experiment, we believe that a certain level of success was achieved. We managed to actively engage the community in our effort and we received around 10-15% of the extra stimulation votes, which is a great result. These votes mostly came from the active part of the community. The only unsuccessful part of the stimulation experiment is attracting less passive votes than expected. Passive voters can be in the best-case scenario accounted for 1-2% of the delegated votes. Since we run the scenario for only a single month, the 1-2% passive vote engagement reflects only a short term result. We are unsure about a long term commitment of the passive votes and will try to monitor future changes and conditions.

5.2 Contribution proposal fund - IISS 2.5 proposal

This CPF treasury proposal below was based on the IISS 2.0 system. Since Foundation came out with IISS 3.0 proposal while we were in the middle of our work, this paragraph will be kept for information purposes if it comes to the point that IISS 3.0 measures need to be reconsidered. For this reason, the proposed changes will be addressed as an IISS 2.5 proposal.

The Contribution proposal fund is intended to be a treasury that will be used by the governance to support and fund the project on the ICON network. The CPF treasury is from the dynamic percentage of the rewards received by the main P-Reps.

We suggest only the top 20 P-Reps to be included in the dynamic fee model. We want to leave main P-Reps ranked 21 and 22 out of treasury system as voting dynamics for these ranks are significantly higher than the top 20 places and for that reason, they will be excluded.

5.2.1 CPF treasure fee

The dynamic community treasury fee will consist of two parts. The fixed multiplier, which is provided through the governance vote, and the daily dynamic fee function that will be based on the top 20 main P-Rep vote distribution. The fee is dynamic because it is changing constantly and adjusting to compensate for the uneven vote distribution.

Community treasury fee (CF) = fixed multiplier (*M_rep)* x dynamic fee function (F)

CF=M_rep x F

Dynamic fee function= P-Rep vote amount/average vote amount per P-Rep

F= V_rep / dV_rep

Fixed multiplier M_rep is a parameter that represents the default basic fee (in percentage %) for the top 20 main P-Reps. The fixed part will have the values from 0-20 that will represent the fee values of 0-20%. For practical reasons, we propose the two ways of defining the fixed parameter:

1. M_rep is defined once a month through the P-Rep governance voting. For the stability purpose, we suggest that the consensus value of the parameter can't vary more than +/- 1 per month. Initial voting consensus over the Fixed parameter can be achieved off-chain with a possibility of moving it on-chain if it passes the testing and ICONists approval.
2. M_rep is defined as the function of the existing governance variable. We propose the use of the existing I_rep parameter where fixed multiplier will be defined as:

   M_rep = ¼ x (I_rep/10000)

If the fixed multiplier is defined through the P-Rep governance voting, we strongly believe that a deployment value of the fund needs to be decided by the governance consensus where the top 100 P-Reps will choose the fixed multiplier (*M_rep*). Three possible solutions are possible:

- **Pre-vote** – top 100 P-Reps will cast a vote before deployment where the consensus value from the votes will be taken. iCONsolidation as P-Rep will support the initial *M_rep* of 10. It will take several months to build the treasury to the level where it will be able to

support meaningful projects. With the higher initial fee, the treasury build speed will be increased and the first treasury contribution proposal deployment would be shortened. That is the main reason why we prefer to start with the highest *M_rep*.

- **No pre-vote** – Community treasure will be started with the *M_rep* value of 5 which will present the middle ground from which the direction and the future fees of the treasury will be decided through the P-Rep governance. While this option is more inert than the previous one, it probably represents the most democratic way to deploy the treasury.
- **Initial investment plus pre-vote** – there is a possibility that Foundation or P-Reps dedicate initial funding to the Community treasury. For the Foundation it means that some of the ICX that has been staked but not voted can be redirected into the fund. For the P-Reps it means they could allocate a portion of their rewards to help boost the start of the fund. If this scenario happens then a pre-vote can decide what speed of treasury fund growth is needed taking into account the number of initial funds.

Dynamic fee function represents a variable showing how far is a P-Rep vote amount from the average vote amount per P-Rep. If the P-Rep vote amount is less than the average than the multiplier is less than 1 and indicates the decreased contribution to the CPF. If the P-Rep vote amount is more than the average, than multiplier over 1 indicates the increased contribution to the CPF.

Dynamic fee function is based on a strict parabolic distribution function where the average number of votes is observed over the top P-Reps. A less strict model is available by reducing the amount of P-Reps used to calculate the average vote amount from 100 to 75, 50, …

No matter which method of treasury deployment is chosen we expect the system to balance itself in 6-12 months from the deployment date.

5.3 Contribution proposal fund - IISS 3.0 proposal

The Foundation proposed the following model of CPF funding in their IISS 3.0 proposal:

> *All P-Reps with greater than 1% delegation will allocate a portion of their earnings to the CPF. Here is the formula to calculate an individual P-Rep's allocation to the CPF:*
>
> ***Greater than 1% Delegation:*** *(Delegation % x i_rep / 2) - (SQRT(Delegation %) x i_rep/2)*
>
> *It is the difference between the IISS 2.0 vote reward (B2) structure and the IISS 3.0 reward structure*
>
> ***All Main P-Reps:*** *(Greater than 1% Delegation Allocation Formula) + i_rep / 2*
>
> *Main P-Reps also allocate the block production reward (B1) to the CPF -* ***this is essential to disincentivize exchanges and whales from running Main P-Reps.***

The proposed initial cap of the Fund is 1,000,000 ICX with the option to be adjusted to match the development and network status. The entire Fund's additional income after the cap is reached is going to be burned. This is a positive measure that will further reduce inflation. As mentioned before, we are at the stage where we don't lack the funds but we are lacking the good projects. The dynamics of the fund will match the dynamics of the ideas. The detailed information can be found at the IISS 3.0 proposal page.

5.4 CPF governance

The deployment of the CPF funds needs to decide through the decentralized governance process. However, the deployment phase of the CPF should start as a centralized initiative with the Foundation as chairman ensuring the Fund decentralization is adopted in the right way.

The deployment of the CPF fund is starting with the proposal seeker writing a contribution proposal. A contribution proposal is a detailed project plan with the defined project scope and development plan. The budget projection with a budget request for the whole project or separate phases is defined.

The CPF governance committee is the one responsible to review and to cast votes for the proposal funding. The initial centralized phase needs to be lead by the Foundation who will be responsible to ensure the voting process is fair. The governance committee consists of the main P-Reps that are reviewing, comparing and evaluating the proposals. They are casting the votes based on their evaluation and if positive consensus is achieved, the proposal is accepted and funds delivered.

The real-world business practices need to be incorporated where the proposal seekers need to promote and present their projects and project updates in a transparent and accountable way. The CPF will establish several templates for writing the proposals and project plans to define a uniform way how projects are presented, compared to each other and finally evaluated.

6. Reward distribution models

In this section, we will look into the IISS 2.0, 2.5 and 3.0 models and see how each of the models reward distribution projection over the different periods (0-10 years) and how centralized each model tends to become.

6.1 IISS 2.0 reward distribution

The IISS 2.0 model distribution is based on the current system where all P-Reps are receiving B2 reward which is at the moment has an annual return of ~12% of the delegated vote amount. Besides this reward, the top 22 P-Reps or the main P-Reps are also receiving the block producing reward B1 at the moment has an annual return of ~6% of the delegated vote amount.

First, we will take a look at the basic reward and vote distribution model over time using the following criteria:

- only B2 rewards taken into the account,
- all P-Reps are restaking full B2 rewards,
- all voters are restaking rewards and vote for the same P-Reps.

The IISS 2.0 reward distribution model is showing the following characteristics when observed over the different periods:

- it is a typical linear distribution model where each of the participants maintains the same percentage of the votes
- the vote amount and monthly reward increases linearly
- the linear factor is the vote percentage, the bigger the percentage displays the steeper line

- the vote distribution model is neutral, it is not trying to either centralize or decentralize the votes
- the model is aiming to maintain the distribution of the votes, i.e. the P-Rep with 5% and one with 10% of the votes will maintain the same percentage of the total votes but their total amount of votes will grow faster.

If we look at the full reward and vote distribution over time using the following criteria:

- all the rewards (B1 and B2) are taken into the account,
- all P-Reps are restaking full rewards,
- all voters are restaking rewards and vote for the same P-Reps.

The IISS 2.0 reward distribution model is showing the following characteristics when observed over the different periods as shown in *Table 1. IISS 2.0 P-Rep reward distribution model* at the end of the document*:*

- it is based on the linear distribution model where each of the participants maintains the same percentage of the votes

- the basic vote amount and monthly reward increases linearly

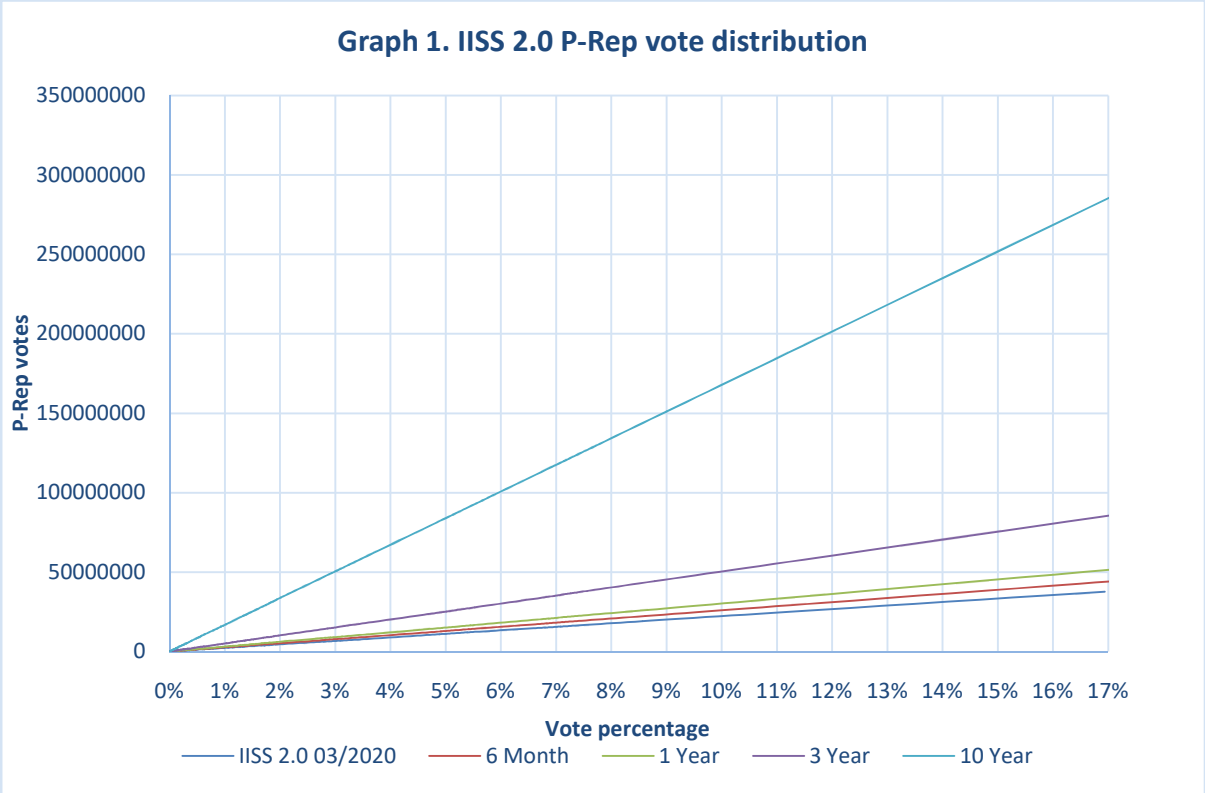
- the linear factor is the vote percentage, the bigger the percentage displays the steeper line

- the vote distribution model is centralized where additional B1 reward is directing more of the vote distribution toward the main P-Reps

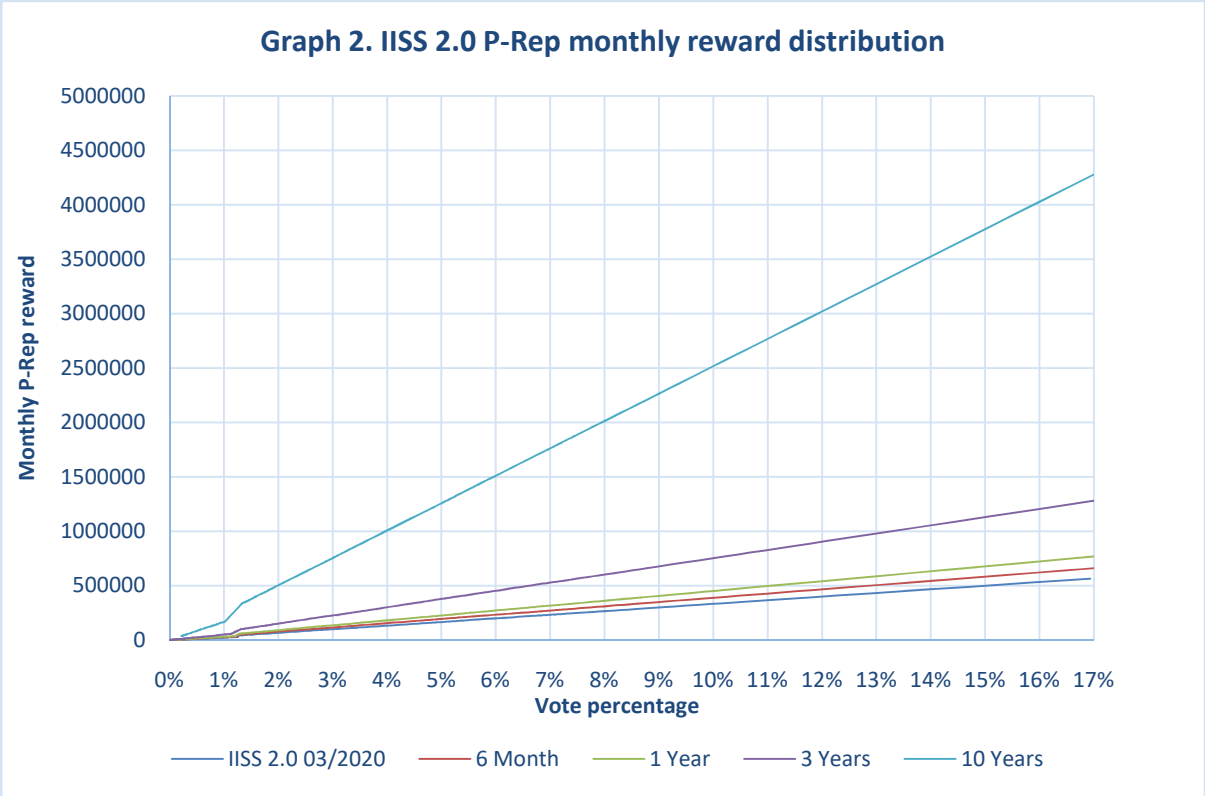
- the amount of votes is rapidly increasing in the favor of the main P-Reps and their vote percentage is growing too which leads to the additional gap between the P-Reps and increased centralization of the votes

- the sub P-Rep amount of votes are growing at a slower pace than the main P-Rep ones. Over time this will affect a decrease in the percentage of the sub P-Rep votes.

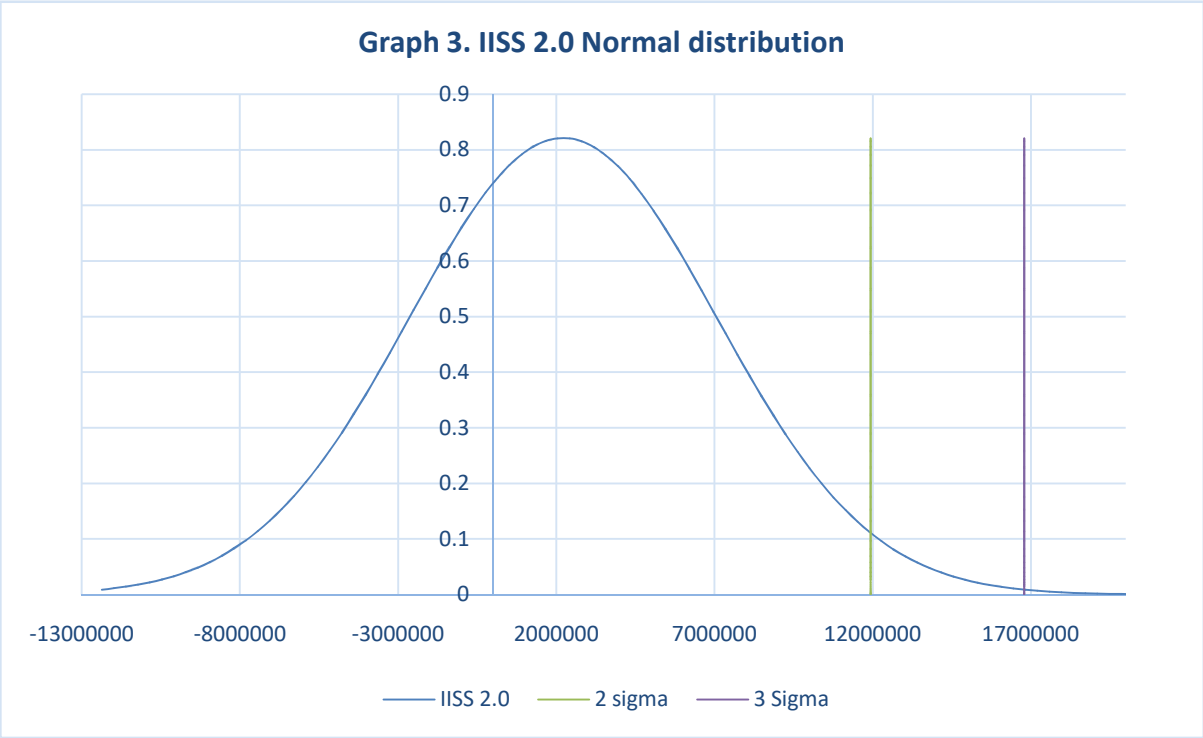
The IISS 2.0 model is very centralized and is increasingly favoring the main P-Reps. Over time the vote amount gap between the teams is getting so big those whole governance dynamics is lost as it is visible in graph 1.



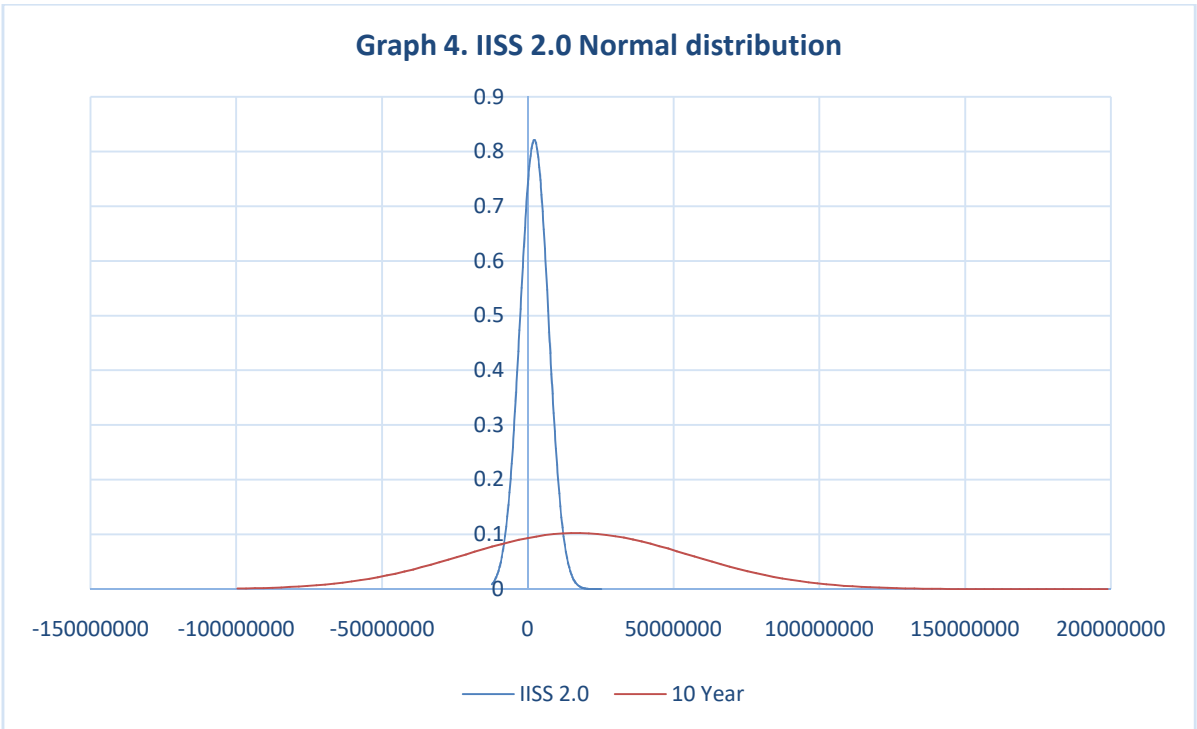
The P-Rep reward distribution is displaying the same linear characteristics where the difference between the P-Rep rewards is increasing, i.e. *the difference in votes between the P-Reps ranked 22 and 23 will increase from 40,000 to over 5,000,000 over the 10 years (Table 1).*



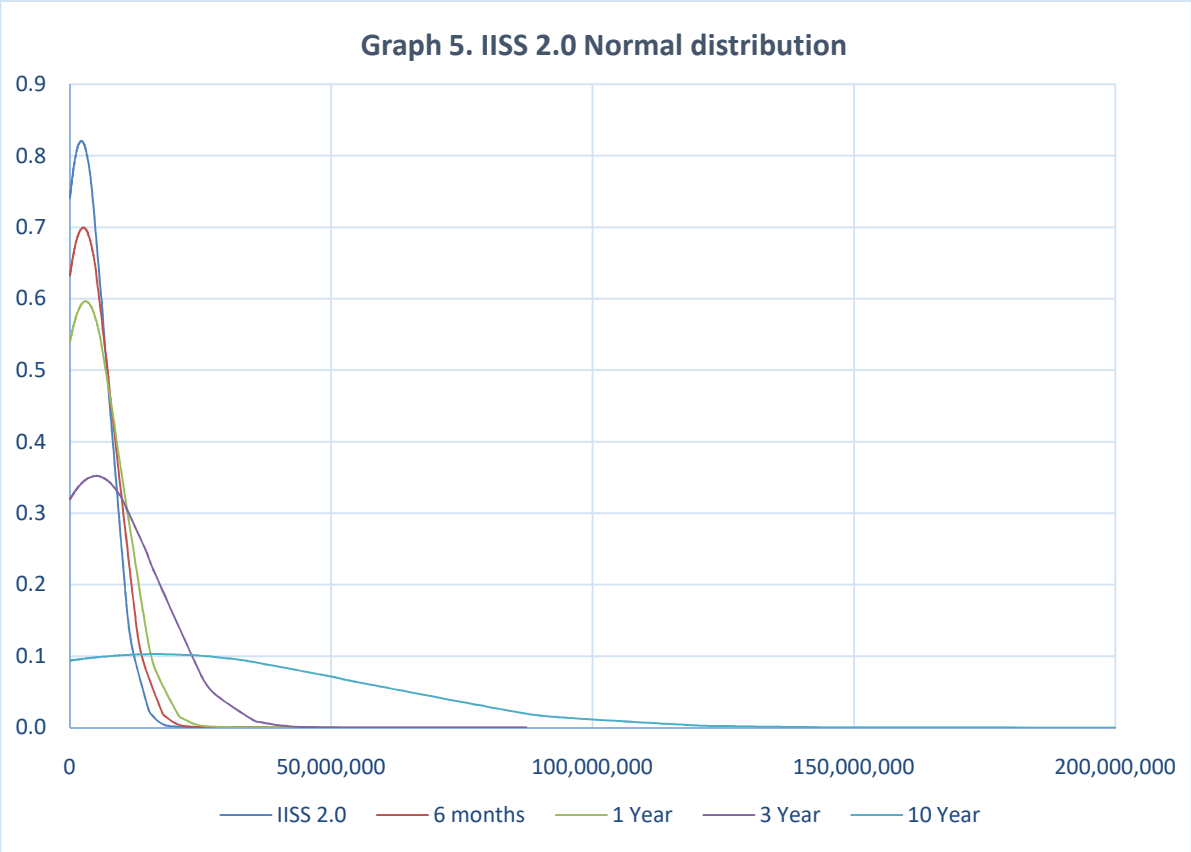
Graph 2 is showing that the reward distribution model of IISS 2.0 is the closest to the linear distribution model, i.e. *the difference in reward between the P-Reps ranked 22 and 23 will increase from 15,000 to over 165,000 over the 10 years (*Table 1).



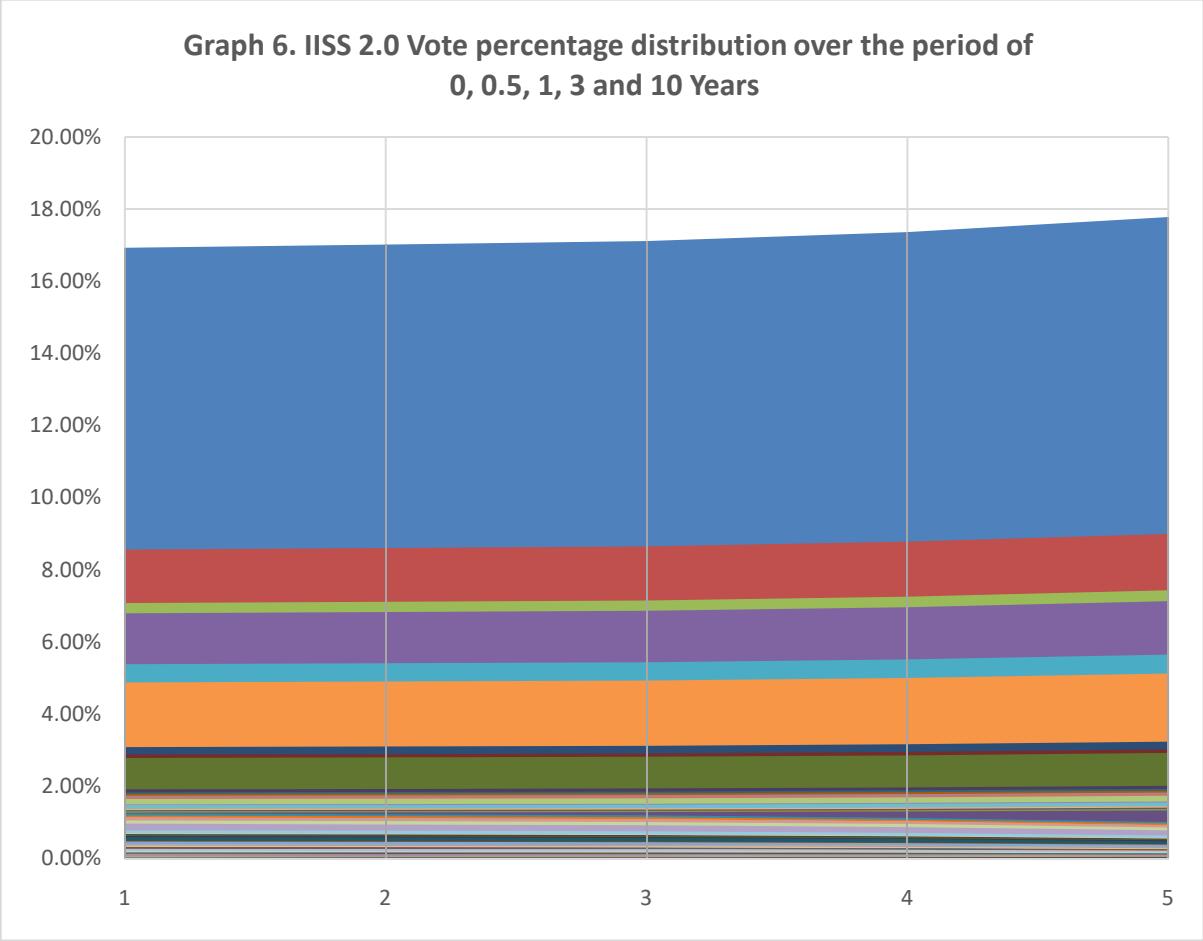
If P-Rep votes are displayed as a normal distribution function in graph 3, then 95.45% of the P-Reps are within the two standard deviations from the mean vote value. The initial model means vote value is distributed between the P-Reps at 28th and 29th place. The number of P-Reps that are falling outside of the 2 sigma is 5. These top 5 P-Reps are holding almost 45% of the total votes.



The 10-year projection of the IISS 2.0 model is also displayed in graph 4.as the normal distribution function. In the 10-year projection, *the top 5 P-Reps are now holding more than 47% of the total votes*. However, only 2 P-Reps are now beyond the 2 sigma mark and they hold a total of 27% of the votes.



The progress of the P-Rep vote distribution through the different periods is displayed in graph 5. It is showing an increased tendency of IISS 2.0 to negatively spread the votes towards the higher end. The starting IISS 2.0 model is dense and presents a dynamic governance model where a small spread between the P-Rep votes is stimulating a positive competition between the teams. The 10-year model prediction is showing a more spread model of votes where the difference between the team's votes is getting so big that is almost impossible to do any changes to the governance rankings.



The difference in the rewards P-Reps are receiving will have an increased effect on the P-Rep growth rate. Over time this will affect a decrease in the percentage of the sub P-Rep votes, as it is visible in graph 6. The IISS 2.0 is stimulating the top P-Reps to increase their vote share just by holding the high amount of votes and restricting the sub P-Reps who are losing vote percentage, i.e. *the difference in vote share between the P-Reps ranked 22 and 23 will increase from 0.02% to 0.32% over the 10 years (*Table 1).

6.2 IISS 2.5 reward distribution

Our IISS 2.5 proposed model distribution is based on the previously explained IISS 2.0 system. All P-Reps are receiving a B2 reward of ~12% and the main P-Reps are also receiving the block producing reward B1 of ~6.

The existing model vote distribution is improved by the introduction of the Contribution proposal Fund. The Fund is financed by redirecting the portion of the main P-Rep rewards to the fund.

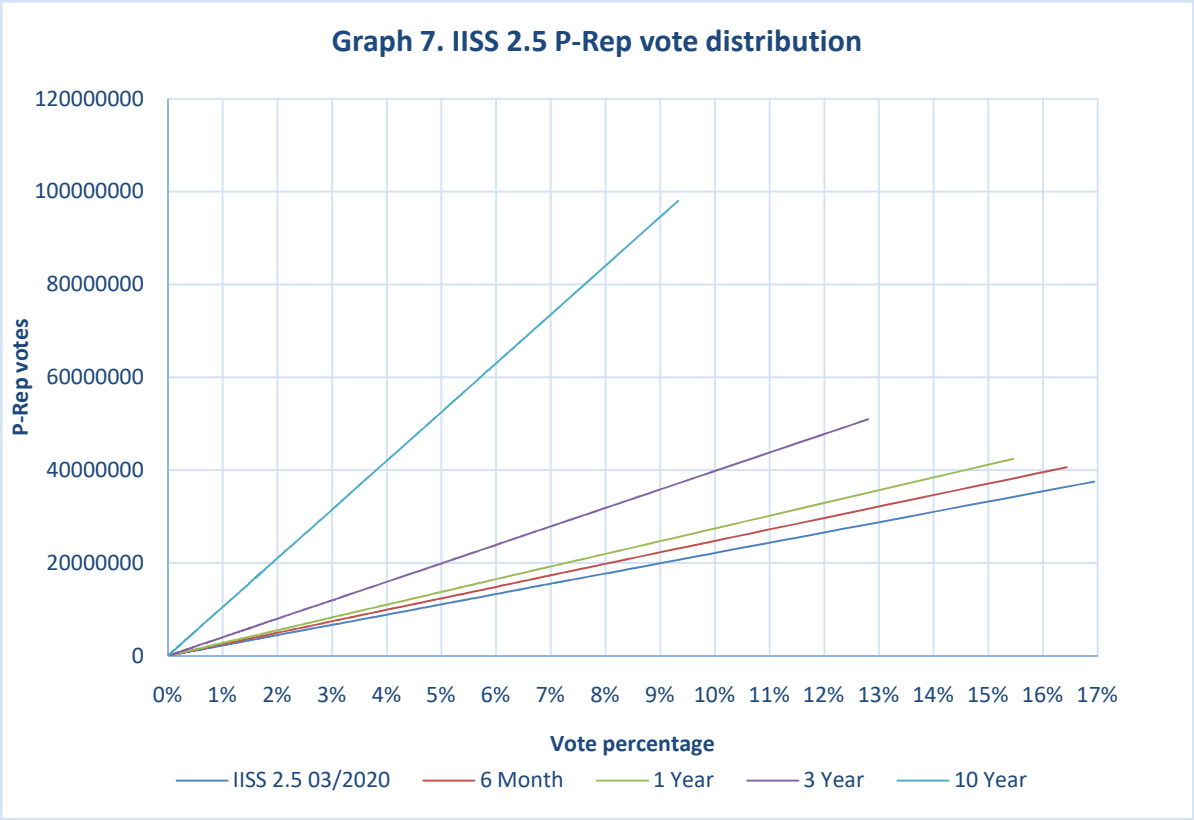
The reward and vote distribution model is observed over the intervals of time using the following criteria:

- all the rewards (B1 and B2) are taken into the account,
- all P-Reps are restaking full rewards,
- all voters are restaking rewards and vote for the same P-Reps.

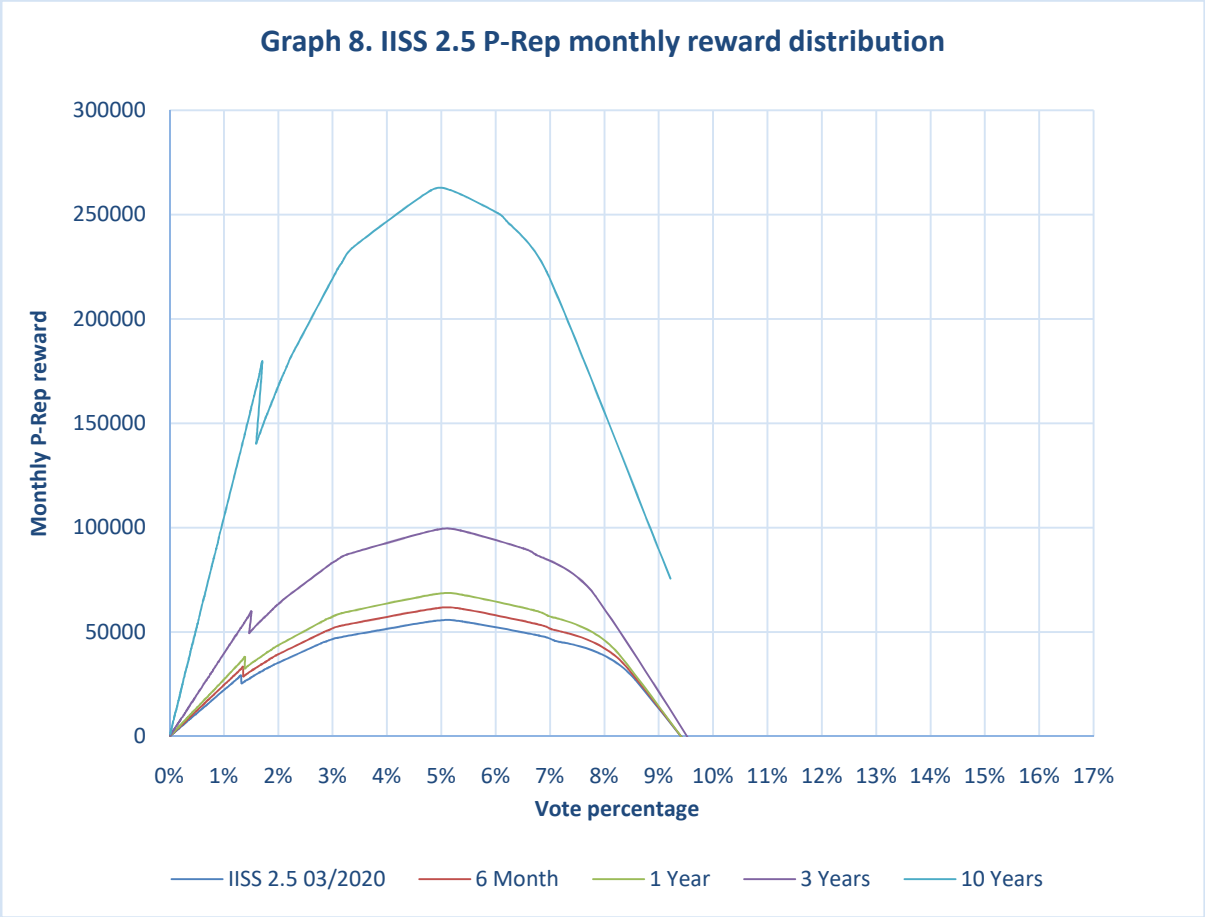
The IISS 2.5 reward distribution model is showing the following characteristics when observed over the different intervals as shown in *Table 2. IISS 2.5 P-Rep reward distribution model* at the end of the document*:*

- it is based on the parabolic distribution model
- the basic vote amount and monthly reward follows a parabolic distribution
- the parabolic distribution is trying to stimulate P-Rep votes to form a more dense governance formation. The center of parabola represents the average vote amount of the P-Reps. The P-Reps with a lower vote than average vote amount will get increased reward stimulation. The ones with the higher vote amount will contribute more to the CPF and as a result, receive a decreased reward.
- the sub P-Rep amount of votes are growing at a faster pace than the main P-Rep ones. Over time this will affect an increase in the percentage of the sub P-Rep and half of the main P-Rep votes. Only the P-Rep with the aggregated vote amount much higher than average vote number will see a decrease in their vote share percentage
- parabolic distribution model highly demotivates single big entities to gather a significant amount of votes to take over network governance like the big exchanges.

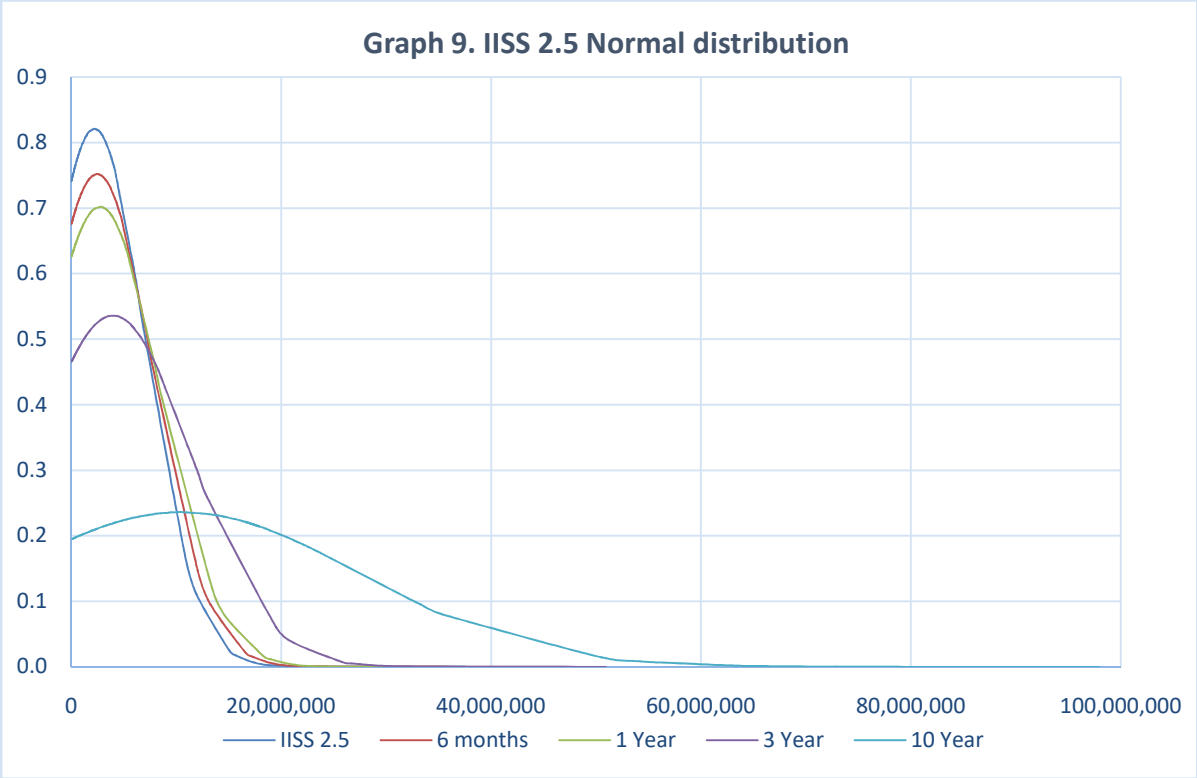
The IISS 2.5 model is trying to decentralize the governance by stimulating the widespread of the votes. Over time the vote amount gap between the teams is trying to be smaller than compared to the IISS 2.0 model as it is visible in graph 6. The top P-Reps are still receiving the increasing number of votes but their vote share is decreasing.



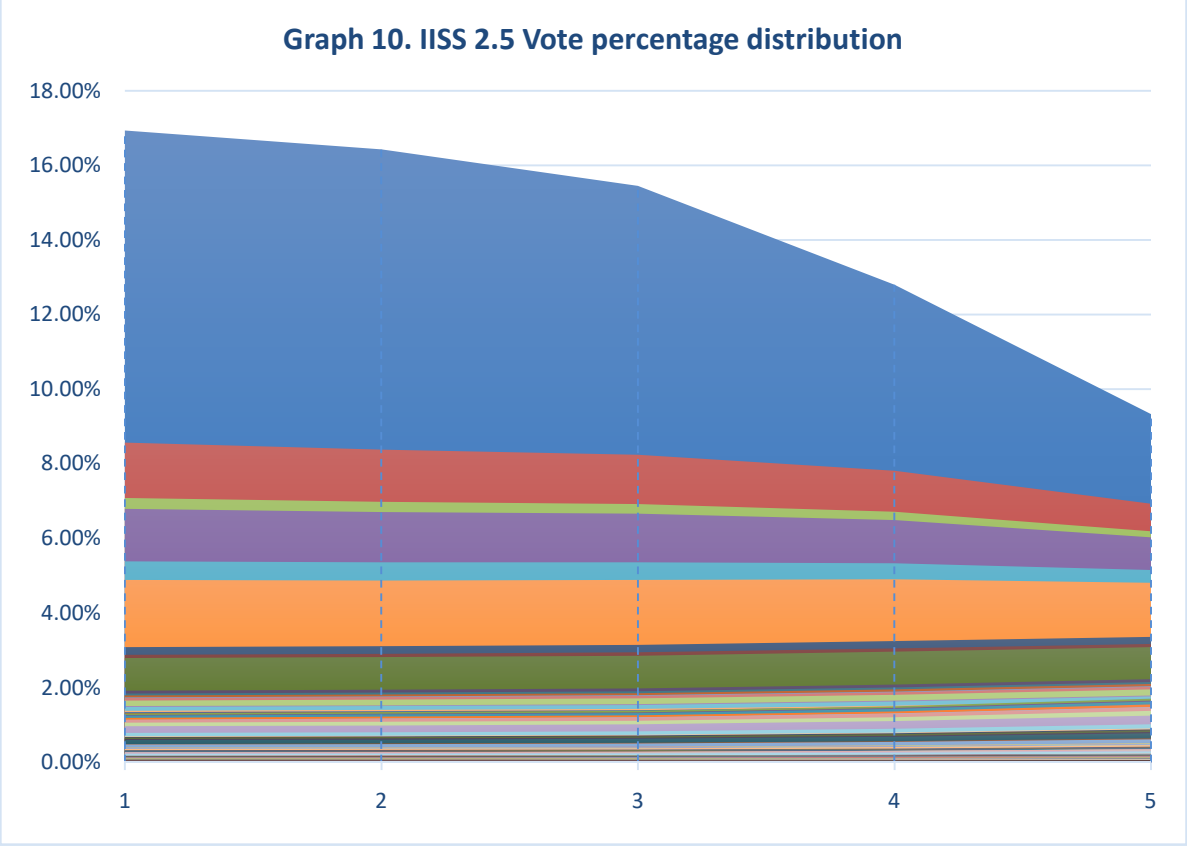
The IISS 2.5 P-Rep vote distribution graph 7 is showing how the model is developing over the years. The graph displays a clear indication of how a P-Reps are accumulating more votes over the years and yet their vote percentage is stimulated towards a unique, more dense and equal governance share.



The graph 8 is showing that the reward distribution model of IISS 2.5 is the parabolic distribution model. Parabola is defined by the focus point representing the average vote percentage of the top 20 P-Reps. The left side of parabola represents the nodes with less than average votes with the upward trend of the rewards received. The right side represents the heavy nodes with over the average number of votes. The heavier the node is, the bigger is the taxation, i.e. *the difference in reward between the P-Reps ranked 22 and 23 will increase from 500 to over 3000 over the 10 years (*Table 1).



The progress of the P-Rep vote distribution through the different periods is displayed in graph 9. It is showing how the growth and vote distribution over the years are concentrated. The 10-year curve compared to the IISS 2.0 one is more concentrated and showing the differences between the P-Rep votes are more compact.



The IISS 2.5 vote distribution model is trying to prevent the P-Reps that are holding the big majority of the votes to keep increasing their percentage of the network owned. At the same time, it is trying to stimulate the growth of the lower-ranked P-Reps with increased rewards.

The vote percentage of the top 6 P-Reps will decrease over the 10 years. All the other P-Reps will see an increase in the vote percentage over this period, i.e. P-Rep ranked 20 will have an increase from 1.32% to 1.59%, the one ranked 10th increase from 1.92% to 2.24% and the one ranked 5th a decrease from 5.39% to 5.16%. More detailed information is presented in Table 2. IISS 2.5 P-Rep reward distribution model.

6.3 IISS 3.0 reward distribution

The Foundation introduced a new improved distribution of rewards in their IISS 3.0 proposal where all the P-Reps with the vote percentage greater than 1% will allocate the part of the reward to the CPF:

> ***Greater than 1% Delegation:*** *(Delegation % x i_rep / 2) - (SQRT(Delegation %) x i_rep/2)*
>
> ***All Main P-Reps:*** *(Greater than 1% Delegation Allocation Formula) + i_rep / 2*

All the main P-Reps will also allocate the block production reward (B1) to the CPF. The distribution of the rewards will reduce the accumulation of the rewards on the heavy vote delegated nodes.

The reward and vote distribution model is observed over the intervals of time using the following criteria:

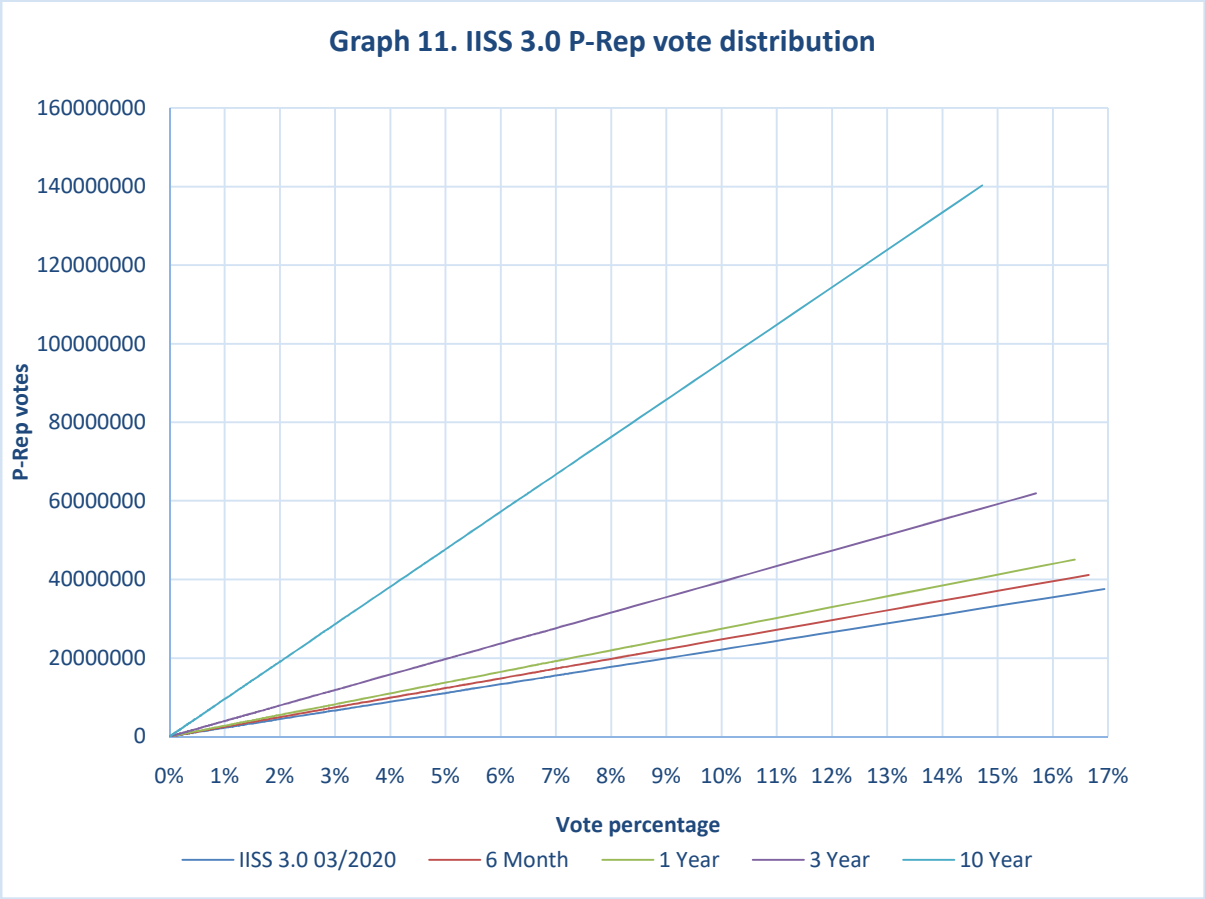
- all the rewards (B1 and B2) are taken into the account,
- B1 rewards are sent to the CPF
- B2 rewards are reduced for the nodes with the vote delegation of more than 1%
- all P-Reps are restaking full rewards,
- all voters are restaking rewards and vote for the same P-Reps.

The IISS 3.0 reward distribution model is showing the following characteristics when observed over the different intervals as shown in *Table 3. IISS 3.0 P-Rep reward distribution model* at the end of the document*:*

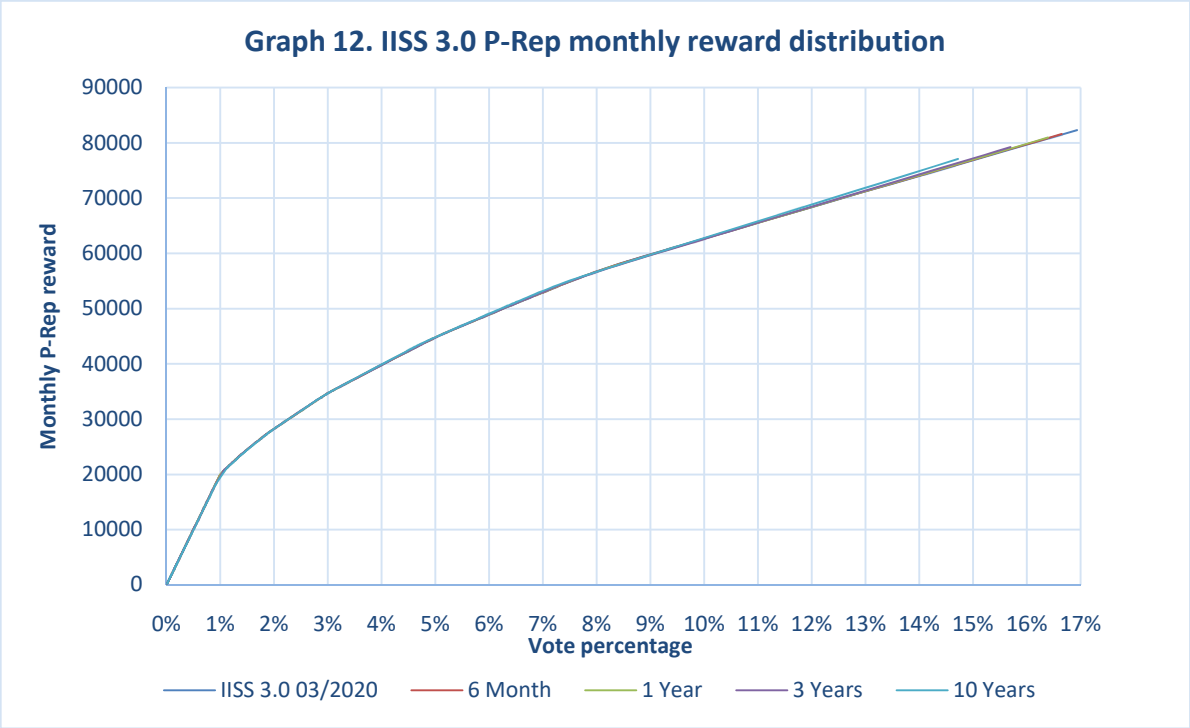
- it is starting as a linear distribution model for the P-Reps with less than 1% of the votes
- it changes into the parabolic distribution model for the P-Reps with more than 1% of the votes
- the parabolic distribution is trying to stimulate P-Rep votes to form a more dense governance formation. The center of parabola represents the average vote amount of the P-Reps. The P-Reps with a lower vote than average vote amount will get increased reward stimulation. The ones with the higher vote amount will contribute more to the CPF and as a result, receive a decreased reward.
- the sub P-Rep amount of votes is growing at a faster pace than the main P-Rep ones. Over time this will affect an increase in the percentage of the sub P-Rep and half of the main P-Rep votes. Only the P-Rep with the aggregated vote amount much higher than average vote number will see a decrease in their vote share percentage

- parabolic distribution model for the heave vote delegated P-Reps highly demotivates single big entities to gather a significant amount of votes to take over network governance like the big exchanges.

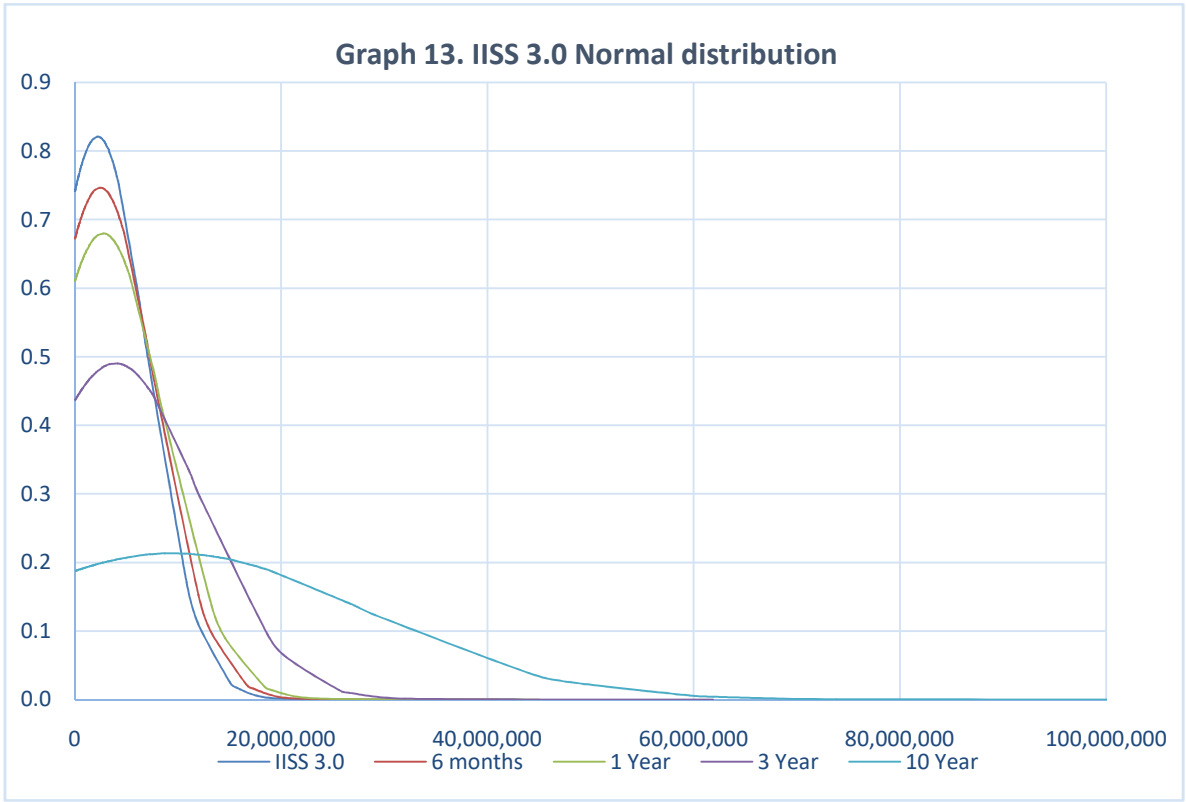
The IISS 3.0 model is trying to decentralize the governance by stimulating the widespread of the votes. Over time the vote amount gap between the teams is trying to be smaller than compared to the IISS 2.0 model as it is visible in graph 6. The top P-Reps are still receiving the increasing number of votes but their vote share is decreasing.



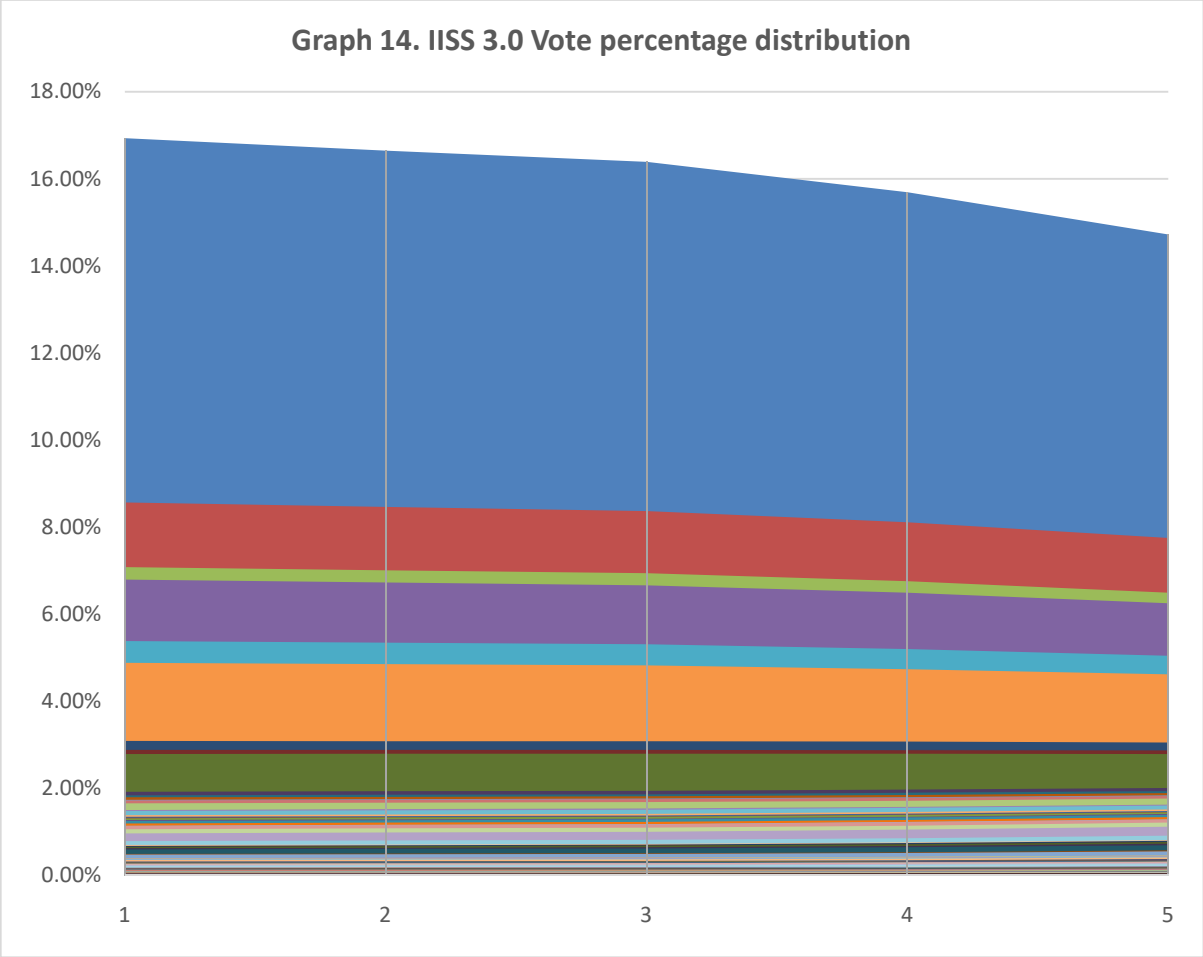
The IISS 3.0 P-Rep vote distribution graph 11 is showing how the model is developing over the years. The graph displays a clear indication of how a P-Reps are accumulating more votes over the years and yet their vote percentage is stimulated towards a unique, more dense and equal governance share.



Graph 12. is showing the transmission of the IISS 3.0 reward distribution model from linear to the parabolic distribution model. The point of transmission is at vote percentage of 1% which represents a value where CPF contribution starts. The higher the percentage of the vote a P-Rep has, the further the parabolic function moves away from the linear distribution line. The heavier the node is, the bigger is the taxation i.e. *the difference in reward between the P-Reps ranked 22 and 23 will be minimal with a decrease from 180 to 160 over the 10 years (*Table 3).



The progress of the P-Rep vote distribution through the different periods is displayed in graph 13. It is showing how the growth and vote distribution over the years are concentrated. The 10-year curve compared to the IISS 2.0 one is more concentrated and showing the differences between the P-Rep votes are being more dense and concentrated.



The IISS 3.0 vote distribution model is trying to prevent the P-Reps that are holding the big majority of the votes to keep increasing their percentage of the network owned. It is trying to stimulate the growth of the lower-ranked P-Reps by keeping the same rewards.

*The vote percentage of the top 6 P-Reps will decrease over the 10 years. All the other P-Reps will see an increase in the vote percentage over this period, i.e. P-Rep ranked 20 will have an increase from 1.32% to 1.46%, the one ranked 10th increase from 1.92% to 2.01% and the one ranked 5th a decrease from 5.39% to 5.05%.*More detailed information is presented in *Table 3. IISS 3.0 P-Rep reward distribution model.*

6.3.1 IISS 3.0 reward distribution P-Rep rewards only

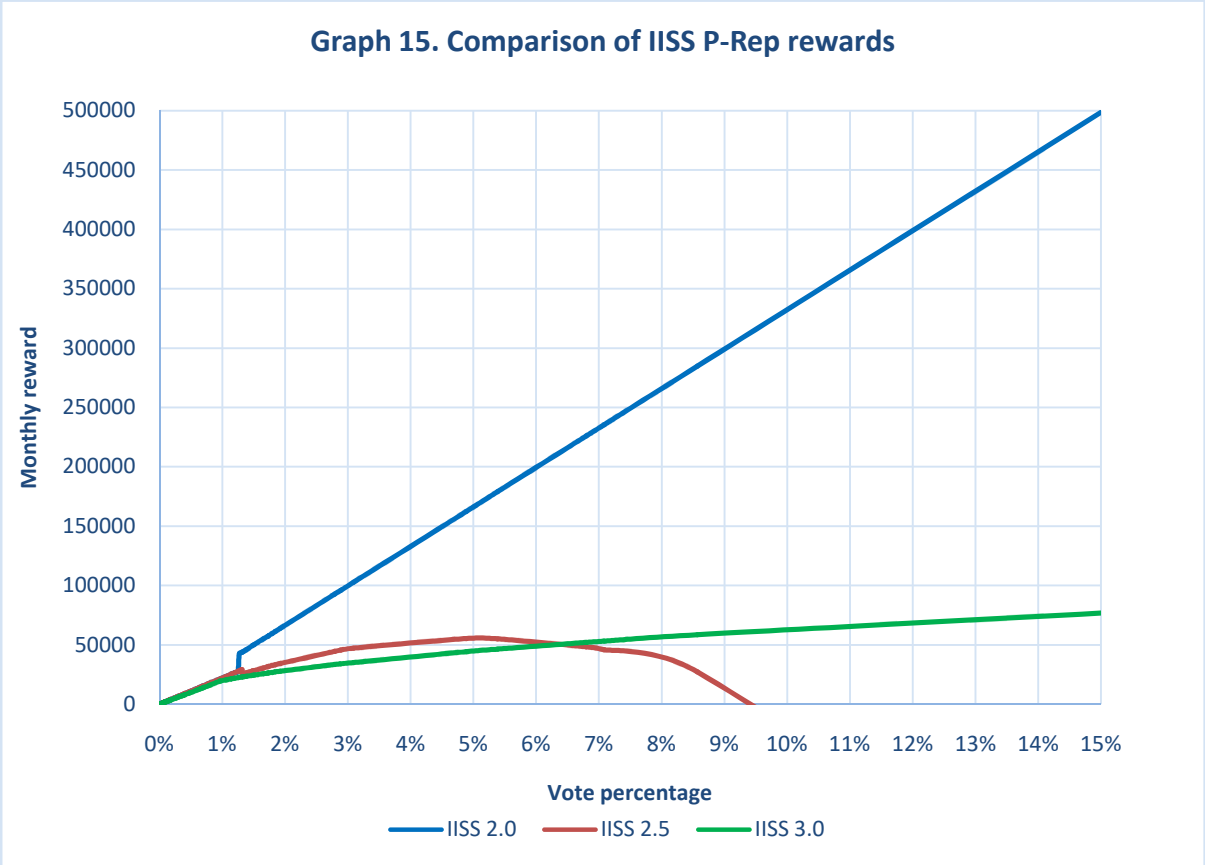
To evaluate the influence of the passive votes to the proposed IISS 3.0 model, the projection of reward distribution without the voters reward is displayed in *Table 4. IISS 3.0 P-Rep reward distribution model- P-Rep reward only.*

Over the 10 years, the P-Rep ranked 20 will have an increase from 1.32% to 1.57%, the one ranked 10th increase from 1.92% to 2.08% and the one ranked 5th a decrease from 5.39% to 4.75%.

Compared to the normal vote delegation percentage in the regular IISS 3.0 model it is clear that the ICONists vote has a major influence on the delegation distribution. If we follow the typical behavior of the voters where 80% of the votes can be assigned to the passive voters, we can conclude that this ecosystem group can slow down the greatest improvement of the governance model significantly. The future governance improvements need to target this group to actively participate in governance.

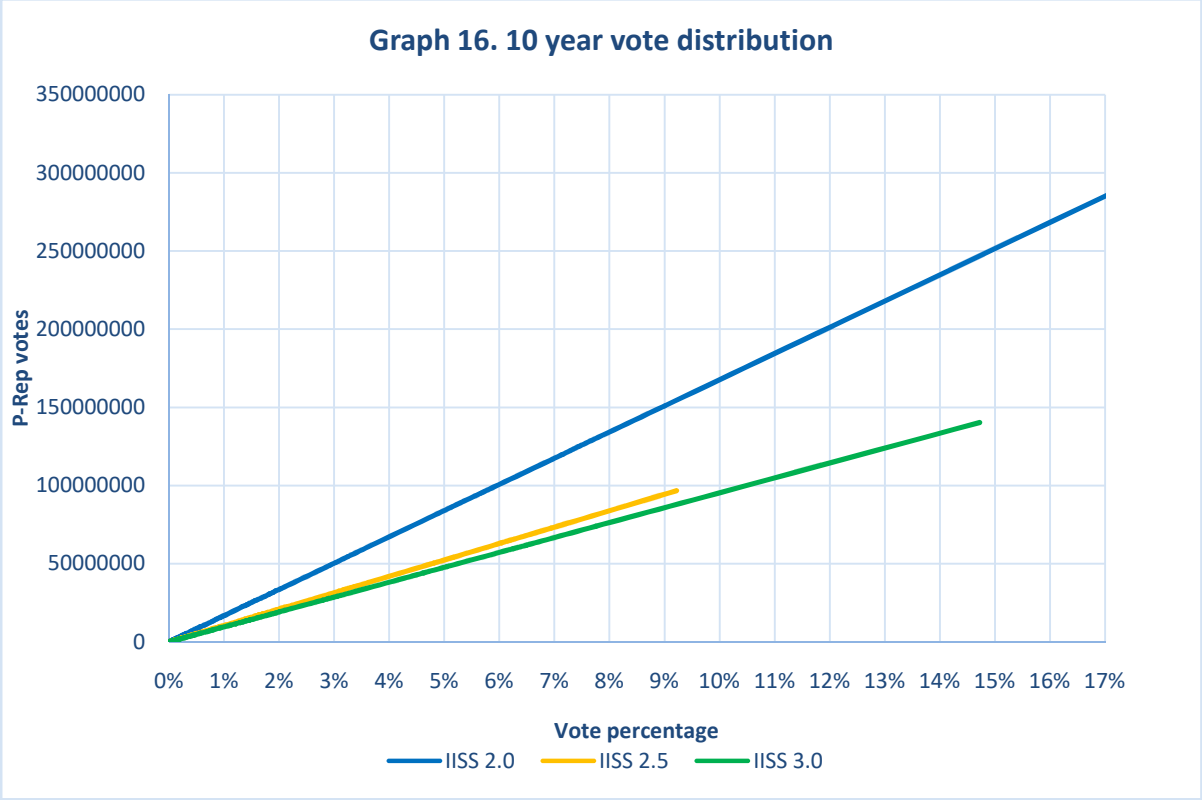
6.4 Comparison between the IISS models

The detailed information and the figures for each of the IISS proposals were explained in the previous chapters together with the numbers displayed in tables at the end of the document. To have a better understanding of the progress of each of the models, their data is displayed together for a better comparison.

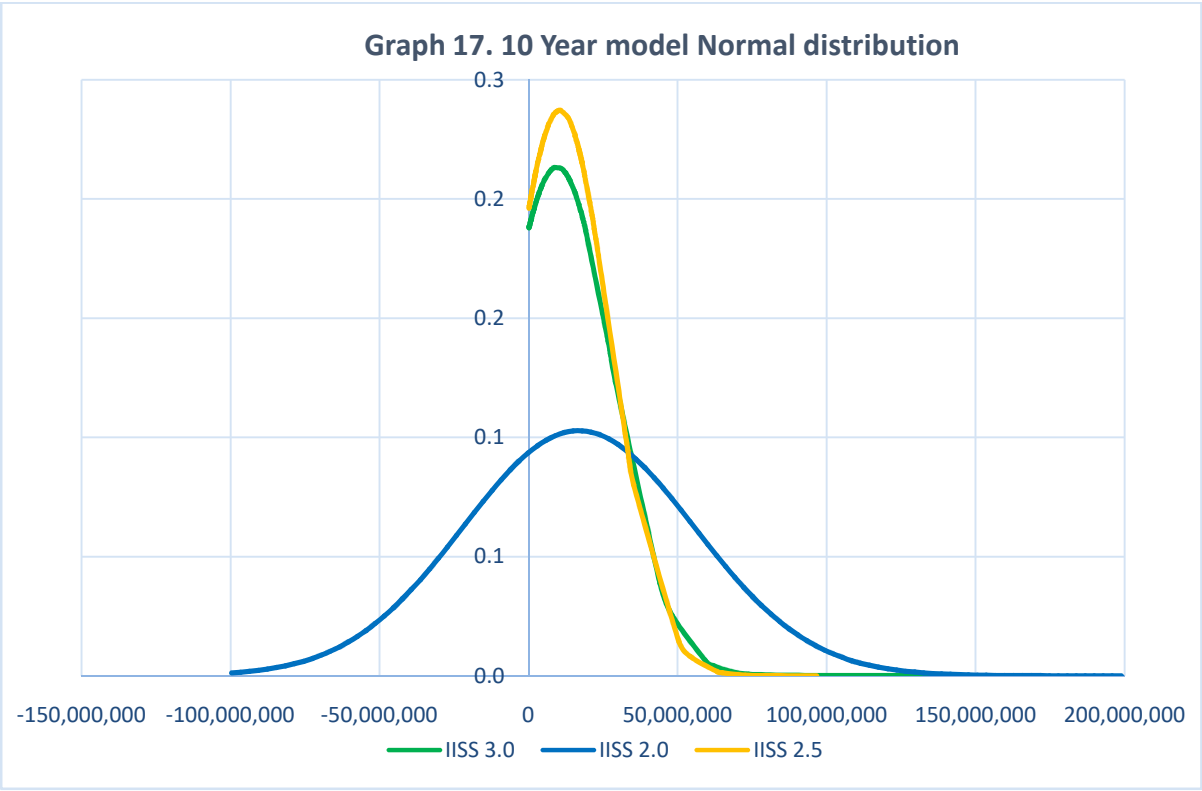


The graph 15 Displays the distribution of the monthly P-Rep rewards. The tendency of reward distribution for each of the proposals is visible. The IISS 2.0 model is providing the most generous rewards and it is a model that is adding the most to the node reward inflation. The 3.0 model is the intermediate one that is primarily focusing on the higher end of the vote delegation table.

The 2.5 model is the most restrictive model for the highest-ranked vote delegations. At the same time, it is more stimulative to all other delegations compared to the IISS 3.0 model as it is visible from the graph and the points where two models are crossing each other.



The graph 16 displays the distribution of the P-Rep votes on the 10-year projection models. From the graph, it is visible how each of the models is influencing the vote delegation percentage. The IISS 2.5 and 3.0 models are both decreasing the vote percentage of the top-heavy delegated nodes. IISS 2.5 is in particular very restricting when it comes to a rebalancing of the huge vote delegations, the top P-Rep vote percentage is reduced from an initial 17% to 9% over the 10 years.



The normal distribution graph of the 10-year IISS models is showing how each model tendency to distribute votes appears after the 10-year simulation. An ideal normal distribution function is a dense curve similar to IISS 2.5 or 3.0 one with the focus point moving to the right as the staked amount increases.

7. Conclusion

ICON introduced the DPoC governance model to build an ecosystem that incentivizes Iconists to act honestly and build a decentralized community. As in every other governance model, the whole process is dynamic and it evolves as the network growth and matures. This paper describes the current state of the ecosystem and its governance. The additional focus is on the proposed adjustment to further reduce the inherited DPoS governance weak points.

The detailed analysis of the existing IISS model and proposed improvements main goal is to display the stimulating and restrictive sides of each of the model for the wider audience. The 10-year projection of the reward distribution models is describing the expected development of the decentralized governance to the Iconists to bring the options on how we want the future governance to look like.

The Contribution Proposal Fund is the most important part of the improvement proposal. It is a pillar of the decentralized development and the decentralized governance voting/election system. In recent weeks a few great initiatives started that will be a great addition of the Fund governance tools. ICONsolidation plans to stay involved in the governance process development and continue the work on further improvement of DPoC and CPF features.

8. Contact details

Official team name: iCONsolidation

- Candidate detail: https://icon.community/iconsensus/candidate_detail/157/
- Telegram: https://t.me/iCONsolidation
- Telegram group: https://t.me/iCONsolidationChat
- Twitter: https://twitter.com/iconsolidation
- Medium: https://medium.com/@iCONsolidation
- Proposal paper: https://github.com/iCONsolidation/Icon-P-Rep/raw/master/DeFiCON%20proposal.pdf
- DeFiCON 1.0 : https://github.com/iCONsolidation/Icon-P-Rep/raw/master/DeFiCON%201.0.pdf
- Public Address: hx55f2cc3244350085734f4e405f761ecf3d2095b3

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https://tracker.icon.foundation/

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https://github.com/EOSIO/Documentation/blob/master/TechnicalWhitePaper.md#consensus-algorithm-bft-dpos

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https://ark.io/Whitepaper.pdf

10. Appendices

Table 1. IISS 2.0 P-Rep reward distribution model

					6 months prediction				1 Year prediction				3 Year prediction				10 Year prediction			
Rank	Delegated Amount		Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%
1	37,532,126	16.94%	562982	517943	17.03%	44,017,678	660265	607444	17.12%	51,623,933	774359	712410	17.37%	87,306,395	1309596	1204828	17.79%	298,518,025	4477770	4119549
2	18,986,794	8.57%	284802	262018	8.61%	22,267,712	334016	307294	8.66%	26,115,572	391734	360395	8.79%	44,166,655	662500	609500	9.00%	151,014,628	2265219	2084002
3	15,696,175	7.08%	235443	216607	7.12%	18,408,474	276127	254037	7.16%	21,589,459	323842	297935	7.26%	36,512,093	547681	503867	7.44%	124,842,147	1872632	1722822
4	15,063,290	6.80%	225949	207873	6.83%	17,666,227	264993	243794	6.87%	20,718,951	310784	285922	6.97%	35,039,889	525598	483550	7.14%	119,808,389	1797126	1653356
5	11,942,009	5.39%	179130	164800	5.42%	14,005,589	210084	193277	5.45%	16,425,754	246386	226675	5.53%	27,779,236	416689	383353	5.66%	94,982,762	1424741	1310762
6	10,829,101	4.89%	162437	149442	4.91%	12,700,370	190506	175265	4.94%	14,894,994	223425	205551	5.01%	25,190,414	377856	347628	5.13%	86,131,062	1291966	1188609
7	6,848,682	3.09%	102730	94512	3.11%	8,032,134	120482	110843	3.12%	9,420,087	141301	129997	3.17%	15,931,250	238969	219851	3.25%	54,472,132	817082	751715
8	6,392,996	2.88%	95895	88223	2.90%	7,497,706	112466	103468	2.92%	8,793,309	131900	121348	2.96%	14,871,244	223069	205223	3.03%	50,847,759	762716	701699
9	6,190,762	2.79%	92861	85433	2.81%	7,260,526	108908	100195	2.82%	8,515,144	127727	117509	2.87%	14,400,812	216012	198731	2.93%	49,239,258	738589	679502
10	4,260,232	1.92%	63903	58791	1.93%	4,996,400	74946	68950	1.94%	5,859,778	87897	80865	1.97%	9,910,056	148651	136759	2.02%	33,884,465	508267	467606
11	4,082,845	1.84%	61243	56343	1.85%	4,788,360	71825	66079	1.86%	5,615,789	84237	77498	1.89%	9,497,422	142461	131064	1.94%	32,473,585	487104	448135
12	3,976,738	1.79%	59651	54879	1.80%	4,663,918	69959	64362	1.81%	5,469,844	82048	75484	1.84%	9,250,600	138759	127658	1.89%	31,629,650	474445	436489
13	3,855,275	1.74%	57829	53203	1.75%	4,521,466	67822	62396	1.76%	5,302,776	79542	73178	1.78%	8,968,054	134521	123759	1.83%	30,663,570	459954	423157
14	3,818,847	1.72%	57283	52700	1.73%	4,478,744	67181	61807	1.74%	5,252,671	78790	72487	1.77%	8,883,317	133250	122590	1.81%	30,373,839	455608	419159
15	3,669,563	1.66%	55043	50640	1.66%	4,303,664	64555	59391	1.67%	5,047,337	75710	69653	1.70%	8,536,056	128041	117798	1.74%	29,186,483	437797	402773
16	3,339,464	1.51%	50092	46085	1.52%	3,916,524	58748	54048	1.52%	4,593,299	68899	63388	1.55%	7,768,188	116523	107201	1.58%	26,560,987	398415	366542
17	3,284,296	1.48%	49264	45323	1.49%	3,851,822	57777	53155	1.50%	4,517,417	67761	62340	1.52%	7,639,856	114598	105430	1.56%	26,122,196	391833	360486
18	3,063,058	1.38%	45946	42270	1.39%	3,592,354	53885	49574	1.40%	4,213,113	63197	58141	1.42%	7,125,217	106878	98328	1.45%	24,362,542	365438	336203
19	2,984,208	1.35%	44763	41182	1.35%	3,499,879	52498	48298	1.36%	4,104,658	61570	56644	1.38%	6,941,797	104127	95797	1.41%	23,735,393	356031	327548
20	2,933,353	1.32%	44000	40480	1.33%	3,440,237	51604	47475	1.34%	4,034,709	60521	55679	1.36%	6,823,501	102353	94164	1.39%	23,330,913	349964	321967
21	2,912,614	1.31%	43689	40194	1.32%	3,415,914	51239	47140	1.33%	4,006,184	60093	55285	1.35%	6,775,258	101629	93499	1.38%	23,165,963	347489	319690
22	2,820,495	1.27%	42307	38923	1.28%	3,307,876	49618	45649	1.29%	3,879,477	58192	53537	1.31%	6,560,972	98415	90541	1.34%	22,433,274	336499	309579

23	2,776,788	1.25%	27768	38320	1.23%	3,173,314	31733	43792	1.20%	3,626,463	36265	50045	1.13%	5,697,899	56979	78631	1.02%	17,089,138	170891	235830
24	2,648,865	1.20%	26489	36554	1.17%	3,027,123	30271	41774	1.15%	3,459,397	34594	47740	1.08%	5,435,404	54354	75009	0.97%	16,301,864	163019	224966
25	2,537,728	1.15%	25377	35021	1.12%	2,900,116	29001	40022	1.10%	3,314,252	33143	45737	1.04%	5,207,353	52074	71861	0.93%	15,617,893	156179	215527
26	2,523,756	1.14%	25238	34828	1.12%	2,884,148	28841	39801	1.09%	3,296,004	32960	45485	1.03%	5,178,682	51787	71466	0.93%	15,531,903	155319	214340
27	2,353,273	1.06%	23533	32475	1.04%	2,689,320	26893	37113	1.02%	3,073,355	30734	42412	0.96%	4,828,856	48289	66638	0.86%	14,482,704	144827	199861
28	2,142,725	0.97%	21427	29570	0.95%	2,448,706	24487	33792	0.93%	2,798,382	27984	38618	0.87%	4,396,817	43968	60676	0.79%	13,186,934	131869	181980
29	1,744,830	0.79%	17448	24079	0.77%	1,993,991	19940	27517	0.76%	2,278,733	22787	31447	0.71%	3,580,346	35803	49409	0.64%	10,738,173	107382	148187
30	1,548,361	0.70%	15484	21367	0.68%	1,769,467	17695	24419	0.67%	2,022,146	20221	27906	0.63%	3,177,196	31772	43845	0.57%	9,529,047	95290	131501
31	1,511,297	0.68%	15113	20856	0.67%	1,727,110	17271	23834	0.65%	1,973,742	19737	27238	0.62%	3,101,143	31011	42796	0.55%	9,300,948	93009	128353
32	1,462,426	0.66%	14624	20181	0.65%	1,671,260	16713	23063	0.63%	1,909,916	19099	26357	0.60%	3,000,860	30009	41412	0.54%	9,000,181	90002	124202
33	1,460,511	0.66%	14605	20155	0.65%	1,669,072	16691	23033	0.63%	1,907,416	19074	26322	0.60%	2,996,932	29969	41358	0.54%	8,988,398	89884	124040
34	1,385,771	0.63%	13858	19124	0.61%	1,583,659	15837	21854	0.60%	1,809,805	18098	24975	0.57%	2,843,566	28436	39241	0.51%	8,528,424	85284	117692
35	1,326,015	0.60%	13260	18299	0.59%	1,515,369	15154	20912	0.57%	1,731,764	17318	23898	0.54%	2,720,948	27209	37549	0.49%	8,160,667	81607	112617
36	1,091,409	0.49%	10914	15061	0.48%	1,247,262	12473	17212	0.47%	1,425,371	14254	19670	0.45%	2,239,544	22395	30906	0.40%	6,716,839	67168	92692
37	1,058,736	0.48%	10587	14611	0.47%	1,209,923	12099	16697	0.46%	1,382,700	13827	19081	0.43%	2,172,499	21725	29980	0.39%	6,515,758	65158	89917
38	879,862	0.40%	8799	12142	0.39%	1,005,506	10055	13876	0.38%	1,149,093	11491	15857	0.36%	1,805,455	18055	24915	0.32%	5,414,920	54149	74726
39	874,691	0.39%	8747	12071	0.39%	999,596	9996	13794	0.38%	1,142,339	11423	15764	0.36%	1,794,843	17948	24769	0.32%	5,383,092	53831	74287
40	850,390	0.38%	8504	11735	0.38%	971,826	9718	13411	0.37%	1,110,603	11106	15326	0.35%	1,744,979	17450	24081	0.31%	5,233,541	52335	72223
41	816,211	0.37%	8162	11264	0.36%	932,765	9328	12872	0.35%	1,065,964	10660	14710	0.33%	1,674,843	16748	23113	0.30%	5,023,190	50232	69320
42	790,763	0.36%	7908	10913	0.35%	903,683	9037	12471	0.34%	1,032,729	10327	14252	0.32%	1,622,624	16226	22392	0.29%	4,866,575	48666	67159
43	714,974	0.32%	7150	9867	0.32%	817,072	8171	11276	0.31%	933,750	9338	12886	0.29%	1,467,109	14671	20246	0.26%	4,400,152	44002	60722
44	685,578	0.31%	6856	9461	0.30%	783,479	7835	10812	0.30%	895,360	8954	12356	0.28%	1,406,789	14068	19414	0.25%	4,219,243	42192	58226
45	677,100	0.31%	6771	9344	0.30%	773,790	7738	10678	0.29%	884,287	8843	12203	0.28%	1,389,392	13894	19174	0.25%	4,167,064	41671	57505
46	657,794	0.30%	6578	9078	0.29%	751,727	7517	10374	0.28%	859,074	8591	11855	0.27%	1,349,776	13498	18627	0.24%	4,048,249	40482	55866
47	638,638	0.29%	6386	8813	0.28%	729,836	7298	10072	0.28%	834,056	8341	11510	0.26%	1,310,469	13105	18084	0.23%	3,930,358	39304	54239
48	605,919	0.27%	6059	8362	0.27%	692,445	6924	9556	0.26%	791,326	7913	10920	0.25%	1,243,331	12433	17158	0.22%	3,728,999	37290	51460
49	599,512	0.27%	5995	8273	0.27%	685,122	6851	9455	0.26%	782,958	7830	10805	0.24%	1,230,183	12302	16977	0.22%	3,689,565	36896	50916
50	598,703	0.27%	5987	8262	0.26%	684,198	6842	9442	0.26%	781,901	7819	10790	0.24%	1,228,523	12285	16954	0.22%	3,684,586	36846	50847

Table 2. IISS 2.5 P-Rep reward distribution model

					6 months prediction				1 Year prediction				3 Year prediction				10 Year prediction			
Rank	Delegated Amount		Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%
1	37,532,126	16.94%	0	517943	16.43%	40,639,787	-261371	560829	15.45%	42,436,534	-231451	585624	12.80%	50,936,701	-142766	702926	9.33%	97,990,202	65554	1352265
2	18,986,794	8.57%	27204	262018	8.38%	20,722,126	33604	285965	8.24%	22,639,544	39741	312426	7.81%	31,091,553	67942	429063	6.94%	72,839,998	223174	1005192
3	15,696,175	7.08%	45795	216607	6.98%	17,270,589	52109	238334	6.92%	19,013,245	58484	262383	6.71%	26,714,055	87769	368654	6.19%	65,053,568	247551	897739
4	15,063,290	6.80%	48250	207873	6.71%	16,600,031	54586	229080	6.67%	18,302,029	61037	252568	6.49%	25,828,548	90608	356434	6.04%	63,380,084	251283	874645
5	11,942,009	5.39%	55071	164800	5.36%	13,261,234	61509	183005	5.36%	14,728,317	68287	203251	5.34%	21,245,213	99004	293184	5.16%	54,189,017	262270	747808
6	10,829,101	4.89%	55377	149442	4.88%	12,058,012	61794	166401	4.89%	13,427,179	68616	185295	4.91%	19,521,050	99429	269390	4.81%	50,501,903	262156	696926
7	6,848,682	3.09%	47323	94512	3.11%	7,699,688	53027	106256	3.15%	8,655,383	59272	119444	3.25%	12,944,572	87329	178635	3.36%	35,285,596	234295	486941
8	6,392,996	2.88%	45488	88223	2.91%	7,195,267	51020	99295	2.95%	8,097,157	57095	111741	3.05%	12,149,222	84392	167659	3.17%	33,321,564	227486	459838
9	6,190,762	2.79%	44614	85433	2.82%	6,971,044	50062	96200	2.86%	7,848,620	56053	108311	2.96%	11,793,359	82975	162748	3.09%	32,434,150	224168	447591
10	4,260,232	1.92%	34413	58791	1.95%	4,819,456	38803	66508	1.99%	5,451,328	43691	75228	2.09%	8,305,399	65716	114615	2.23%	23,453,172	182154	323654
11	4,082,845	1.84%	33307	56343	1.87%	4,620,745	37575	63766	1.90%	5,228,791	42331	72157	2.00%	7,976,522	63773	110076	2.15%	22,579,859	177249	311602
12	3,976,738	1.79%	32632	54879	1.82%	4,501,802	36824	62125	1.86%	5,095,495	41500	70318	1.96%	7,779,115	62581	107352	2.10%	22,053,465	174222	304338
13	3,855,275	1.74%	31846	53203	1.77%	4,365,569	35950	60245	1.80%	4,942,739	40531	68210	1.90%	7,552,506	61188	104225	2.04%	21,447,172	170671	295971
14	3,818,847	1.72%	31608	52700	1.75%	4,324,696	35685	59681	1.78%	4,896,891	40236	67577	1.88%	7,484,413	60765	103285	2.02%	21,264,567	169587	293451
15	3,669,563	1.66%	30620	50640	1.68%	4,157,121	34584	57368	1.71%	4,708,834	39014	64982	1.81%	7,204,726	59000	99425	1.95%	20,512,470	165058	283072
16	3,339,464	1.51%	28363	46085	1.53%	3,786,148	32066	52249	1.56%	4,292,035	36212	59230	1.65%	6,582,640	54935	90840	1.79%	18,827,795	154522	259824
17	3,284,296	1.48%	27976	45323	1.51%	3,724,091	31633	51392	1.54%	4,222,246	35730	58267	1.63%	6,478,182	54234	89399	1.77%	18,543,309	152690	255898
18	3,063,058	1.38%	26397	42270	1.41%	3,475,062	29868	47956	1.44%	3,942,005	33761	54400	1.52%	6,057,863	51355	83599	1.66%	17,393,938	145129	240036
19	2,984,208	1.35%	25824	41182	1.37%	3,386,243	29226	46730	1.40%	3,841,981	33044	53019	1.48%	5,907,510	50303	81524	1.62%	16,980,983	142352	234338
20	2,933,353	1.32%	25451	40480	1.35%	3,328,941	28809	45939	1.38%	3,777,430	32578	52129	1.46%	5,810,386	49618	80183	1.59%	16,713,718	140537	230649
21	2,912,614	1.31%	29126	40194	1.35%	3,328,536	33285	45934	1.39%	3,803,850	38039	52493	1.50%	5,976,610	59766	82477	1.71%	17,925,048	179250	247366

22	2,820,495	1.27%	28205	38923	1.30%	3,223,261	32233	44481	1.34%	3,683,543	36835	50833	1.45%	5,787,583	57876	79869	1.65%	17,358,118	173581	239542
23	2,776,788	1.25%	27768	38320	1.28%	3,173,314	31733	43792	1.32%	3,626,463	36265	50045	1.43%	5,697,899	56979	78631	1.63%	17,089,138	170891	235830
24	2,648,865	1.20%	26489	36554	1.22%	3,027,123	30271	41774	1.26%	3,459,397	34594	47740	1.37%	5,435,404	54354	75009	1.55%	16,301,864	163019	224966
25	2,537,728	1.15%	25377	35021	1.17%	2,900,116	29001	40022	1.21%	3,314,252	33143	45737	1.31%	5,207,353	52074	71861	1.49%	15,617,893	156179	215527
26	2,523,756	1.14%	25238	34828	1.17%	2,884,148	28841	39801	1.20%	3,296,004	32960	45485	1.30%	5,178,682	51787	71466	1.48%	15,531,903	155319	214340
27	2,353,273	1.06%	23533	32475	1.09%	2,689,320	26893	37113	1.12%	3,073,355	30734	42412	1.21%	4,828,856	48289	66638	1.38%	14,482,704	144827	199861
28	2,142,725	0.97%	21427	29570	0.99%	2,448,706	24487	33792	1.02%	2,798,382	27984	38618	1.11%	4,396,817	43968	60676	1.26%	13,186,934	131869	181980
29	1,744,830	0.79%	17448	24079	0.81%	1,993,991	19940	27517	0.83%	2,278,733	22787	31447	0.90%	3,580,346	35803	49409	1.02%	10,738,173	107382	148187
30	1,548,361	0.70%	15484	21367	0.72%	1,769,467	17695	24419	0.74%	2,022,146	20221	27906	0.80%	3,177,196	31772	43845	0.91%	9,529,047	95290	131501
31	1,511,297	0.68%	15113	20856	0.70%	1,727,110	17271	23834	0.72%	1,973,742	19737	27238	0.78%	3,101,143	31011	42796	0.89%	9,300,948	93009	128353
32	1,462,426	0.66%	14624	20181	0.68%	1,671,260	16713	23063	0.70%	1,909,916	19099	26357	0.75%	3,000,860	30009	41412	0.86%	9,000,181	90002	124202
33	1,460,511	0.66%	14605	20155	0.67%	1,669,072	16691	23033	0.69%	1,907,416	19074	26322	0.75%	2,996,932	29969	41358	0.86%	8,988,398	89884	124040
34	1,385,771	0.63%	13858	19124	0.64%	1,583,659	15837	21854	0.66%	1,809,805	18098	24975	0.71%	2,843,566	28436	39241	0.81%	8,528,424	85284	117692
35	1,326,015	0.60%	13260	18299	0.61%	1,515,369	15154	20912	0.63%	1,731,764	17318	23898	0.68%	2,720,948	27209	37549	0.78%	8,160,667	81607	112617
36	1,091,409	0.49%	10914	15061	0.50%	1,247,262	12473	17212	0.52%	1,425,371	14254	19670	0.56%	2,239,544	22395	30906	0.64%	6,716,839	67168	92692
37	1,058,736	0.48%	10587	14611	0.49%	1,209,923	12099	16697	0.50%	1,382,700	13827	19081	0.55%	2,172,499	21725	29980	0.62%	6,515,758	65158	89917
38	879,862	0.40%	8799	12142	0.41%	1,005,506	10055	13876	0.42%	1,149,093	11491	15857	0.45%	1,805,455	18055	24915	0.52%	5,414,920	54149	74726
39	874,691	0.39%	8747	12071	0.40%	999,596	9996	13794	0.42%	1,142,339	11423	15764	0.45%	1,794,843	17948	24769	0.51%	5,383,092	53831	74287
40	850,390	0.38%	8504	11735	0.39%	971,826	9718	13411	0.40%	1,110,603	11106	15326	0.44%	1,744,979	17450	24081	0.50%	5,233,541	52335	72223
41	816,211	0.37%	8162	11264	0.38%	932,765	9328	12872	0.39%	1,065,964	10660	14710	0.42%	1,674,843	16748	23113	0.48%	5,023,190	50232	69320
42	790,763	0.36%	7908	10913	0.37%	903,683	9037	12471	0.38%	1,032,729	10327	14252	0.41%	1,622,624	16226	22392	0.46%	4,866,575	48666	67159
43	714,974	0.32%	7150	9867	0.33%	817,072	8171	11276	0.34%	933,750	9338	12886	0.37%	1,467,109	14671	20246	0.42%	4,400,152	44002	60722
44	685,578	0.31%	6856	9461	0.32%	783,479	7835	10812	0.33%	895,360	8954	12356	0.35%	1,406,789	14068	19414	0.40%	4,219,243	42192	58226
45	677,100	0.31%	6771	9344	0.31%	773,790	7738	10678	0.32%	884,287	8843	12203	0.35%	1,389,392	13894	19174	0.40%	4,167,064	41671	57505
46	657,794	0.30%	6578	9078	0.30%	751,727	7517	10374	0.31%	859,074	8591	11855	0.34%	1,349,776	13498	18627	0.39%	4,048,249	40482	55866
47	638,638	0.29%	6386	8813	0.30%	729,836	7298	10072	0.30%	834,056	8341	11510	0.33%	1,310,469	13105	18084	0.37%	3,930,358	39304	54239
48	605,919	0.27%	6059	8362	0.28%	692,445	6924	9556	0.29%	791,326	7913	10920	0.31%	1,243,331	12433	17158	0.36%	3,728,999	37290	51460
49	599,512	0.27%	5995	8273	0.28%	685,122	6851	9455	0.29%	782,958	7830	10805	0.31%	1,230,183	12302	16977	0.35%	3,689,565	36896	50916
50	598,703	0.27%	5987	8262	0.28%	684,198	6842	9442	0.28%	781,901	7819	10790	0.31%	1,228,523	12285	16954	0.35%	3,684,586	36846	50847

Table 3. IISS 3.0 P-Rep reward distribution model – P-Rep reward only, voter reward restake not included

					6 months prediction			1 Year prediction			3 Year prediction			10 Year prediction		
Rank	Delegated Amount	Vote %	Monthly P-Rep reward 1.0003%	Voter P-Rep reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%
1	37,532,126	16.94%	82305	517943	16.63%	38,025,955	81551	16.33%	38,515,264	80825	15.29%	40,455,053	78215	12.82%	47,025,145	70620
2	18,986,794	8.57%	58540	262018	8.46%	19,338,031	58156	8.35%	19,686,969	57785	7.97%	21,073,813	56452	7.04%	25,815,760	52714
3	15,696,175	7.08%	53226	216607	7.00%	16,015,529	52925	6.93%	16,333,080	52633	6.65%	17,596,280	51584	5.98%	21,929,348	48611
4	15,063,290	6.80%	52142	207873	6.72%	15,376,139	51858	6.65%	15,687,287	51582	6.40%	16,925,262	50591	5.77%	21,174,908	47773
5	11,942,009	5.39%	46426	164800	5.34%	12,220,566	46231	5.30%	12,497,954	46041	5.14%	13,602,942	45355	4.75%	17,412,737	43353
6	10,829,101	4.89%	44210	149442	4.85%	11,094,361	44050	4.82%	11,358,659	43893	4.69%	12,412,079	43324	4.37%	16,051,291	41637
7	6,848,682	3.09%	35158	94512	3.09%	7,059,631	35138	3.08%	7,270,462	35116	3.07%	8,113,251	35027	3.01%	11,055,521	34610
8	6,392,996	2.88%	33968	88223	2.88%	6,596,807	33967	2.88%	6,800,609	33963	2.88%	7,615,711	33936	2.85%	10,466,338	33683
9	6,190,762	2.79%	33427	85433	2.79%	6,391,323	33434	2.80%	6,591,926	33437	2.80%	7,394,425	33439	2.78%	10,203,332	33261
10	4,260,232	1.92%	27729	58791	1.94%	4,426,608	27824	1.95%	4,593,555	27913	1.99%	5,263,459	28212	2.08%	7,633,308	28809
11	4,082,845	1.84%	27146	56343	1.86%	4,245,720	27250	1.87%	4,409,220	27347	1.92%	5,065,545	27677	2.01%	7,390,413	28352
12	3,976,738	1.79%	26791	54879	1.81%	4,137,483	26900	1.82%	4,298,886	27003	1.87%	4,946,947	27351	1.97%	7,244,438	28073
13	3,855,275	1.74%	26379	53203	1.75%	4,013,546	26494	1.77%	4,172,513	26603	1.82%	4,810,978	26973	1.93%	7,076,675	27750
14	3,818,847	1.72%	26254	52700	1.74%	3,976,369	26371	1.75%	4,134,598	26482	1.80%	4,770,155	26858	1.91%	7,026,219	27652
15	3,669,563	1.66%	25735	50640	1.67%	3,823,976	25861	1.69%	3,979,143	25979	1.74%	4,602,638	26382	1.86%	6,818,733	27245
16	3,339,464	1.51%	24551	46085	1.52%	3,486,768	24695	1.54%	3,634,936	24830	1.60%	4,230,854	25294	1.73%	6,355,561	26313
17	3,284,296	1.48%	24347	45323	1.50%	3,430,378	24494	1.52%	3,577,343	24632	1.58%	4,168,521	25107	1.71%	6,277,518	26153
18	3,063,058	1.38%	23513	42270	1.40%	3,204,134	23673	1.42%	3,346,169	23823	1.48%	3,917,927	24341	1.62%	5,962,550	25495
19	2,984,208	1.35%	23208	41182	1.37%	3,123,456	23373	1.38%	3,263,692	23528	1.45%	3,828,359	24061	1.59%	5,849,476	25255
20	2,933,353	1.32%	23009	40480	1.34%	3,071,410	23177	1.36%	3,210,473	23335	1.43%	3,770,517	23878	1.57%	5,776,308	25098
21	2,912,614	1.31%	22928	40194	1.33%	3,050,182	23097	1.35%	3,188,763	23256	1.42%	3,746,911	23804	1.57%	5,746,413	25034

22	2,820,495	1.27%	22562	38923	1.29%	2,955,869	22737	1.31%	3,092,291	22902	1.38%	3,641,931	23468	1.53%	5,613,224	24745
23	2,776,788	1.25%	22387	38320	1.27%	2,911,110	22564	1.29%	3,046,496	22731	1.36%	3,592,050	23306	1.51%	5,549,796	24607
24	2,648,865	1.20%	21865	36554	1.22%	2,780,057	22050	1.23%	2,912,360	22225	1.30%	3,445,769	22827	1.46%	5,363,237	24194
25	2,537,728	1.15%	21402	35021	1.17%	2,666,138	21594	1.19%	2,795,702	21776	1.25%	3,318,318	22401	1.42%	5,199,991	23827
26	2,523,756	1.14%	21343	34828	1.16%	2,651,811	21536	1.18%	2,781,026	21718	1.25%	3,302,270	22347	1.41%	5,179,387	23780
27	2,353,273	1.06%	20609	32475	1.08%	2,476,928	20814	1.10%	2,601,810	21007	1.17%	3,105,978	21672	1.34%	4,926,452	23199
28	2,142,725	0.97%	19337	29570	0.99%	2,258,746	19752	1.01%	2,377,260	20080	1.08%	2,859,182	20793	1.26%	4,605,832	22440
29	1,744,830	0.79%	15746	24079	0.80%	1,839,306	16084	0.82%	1,935,812	16417	0.88%	2,329,814	17616	1.04%	3,809,543	20706
30	1,548,361	0.70%	13973	21367	0.71%	1,632,199	14273	0.73%	1,717,839	14568	0.78%	2,067,475	15632	0.92%	3,380,586	19119
31	1,511,297	0.68%	13639	20856	0.70%	1,593,128	13932	0.71%	1,676,718	14219	0.76%	2,017,986	15258	0.90%	3,299,664	18662
32	1,462,426	0.66%	13197	20181	0.67%	1,541,611	13481	0.69%	1,622,498	13760	0.74%	1,952,730	14765	0.87%	3,192,962	18058
33	1,460,511	0.66%	13180	20155	0.67%	1,539,593	13464	0.69%	1,620,374	13742	0.74%	1,950,173	14745	0.87%	3,188,782	18034
34	1,385,771	0.63%	12506	19124	0.64%	1,460,805	12775	0.65%	1,537,452	13038	0.70%	1,850,375	13991	0.82%	3,025,599	17112
35	1,326,015	0.60%	11966	18299	0.61%	1,397,813	12224	0.62%	1,471,155	12476	0.67%	1,770,584	13387	0.79%	2,895,131	16374
36	1,091,409	0.49%	9849	15061	0.50%	1,150,505	10061	0.51%	1,210,871	10269	0.55%	1,457,323	11019	0.65%	2,382,909	13477
37	1,058,736	0.48%	9554	14611	0.49%	1,116,062	9760	0.50%	1,174,621	9961	0.53%	1,413,695	10689	0.63%	2,311,572	13073
38	879,862	0.40%	7940	12142	0.41%	927,503	8111	0.41%	976,169	8278	0.44%	1,174,851	8883	0.52%	1,921,032	10865
39	874,691	0.39%	7894	12071	0.40%	922,052	8063	0.41%	970,431	8230	0.44%	1,167,946	8831	0.52%	1,909,740	10801
40	850,390	0.38%	7674	11735	0.39%	896,436	7839	0.40%	943,471	8001	0.43%	1,135,498	8586	0.51%	1,856,685	10501
41	816,211	0.37%	7366	11264	0.38%	860,405	7524	0.38%	905,550	7680	0.41%	1,089,859	8240	0.49%	1,782,059	10079
42	790,763	0.36%	7136	10913	0.36%	833,579	7290	0.37%	877,317	7440	0.40%	1,055,879	7984	0.47%	1,726,498	9764
43	714,974	0.32%	6452	9867	0.33%	753,687	6591	0.34%	793,233	6727	0.36%	954,682	7218	0.43%	1,561,026	8829
44	685,578	0.31%	6187	9461	0.32%	722,700	6320	0.32%	760,619	6450	0.35%	915,430	6922	0.41%	1,496,846	8466

Table 4. IISS 3.0 P-Rep reward distribution model – P-Rep reward with voter reward restaked

					6 months prediction				1 Year prediction				3 Year prediction				10 Year prediction			
Rank	Delegated Amount		Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%	Vote %	P-Rep Votes	Monthly P-Rep reward 1.0003%	Voter reward 1.38%
1	37,532,126	16.94%	82305	517943	16.65%	41,133,615	81608	567644	16.40%	45,029,124	80984	621402	15.70%	61,886,376	79240	854032	14.72%	140,281,256	77098	1935881
2	18,986,794	8.57%	58540	262018	8.46%	20,910,137	58185	288560	8.37%	22,990,606	57866	317270	8.12%	31,993,886	56975	441516	7.75%	73,867,078	55870	1019366
3	15,696,175	7.08%	53226	216607	7.01%	17,315,172	52947	238949	6.94%	19,066,553	52697	263118	6.76%	26,646,125	51996	367717	6.50%	61,901,939	51122	854247
4	15,063,290	6.80%	52142	207873	6.73%	16,623,380	51879	229403	6.67%	18,311,069	51642	252693	6.50%	25,615,115	50980	353489	6.25%	59,590,451	50153	822348
5	11,942,009	5.39%	46426	164800	5.35%	13,209,364	46246	182289	5.31%	14,580,575	46083	201212	5.20%	20,515,645	45624	283116	5.05%	48,129,782	45045	664191
6	10,829,101	4.89%	44210	149442	4.85%	11,991,010	44062	165476	4.82%	13,248,235	43927	182826	4.74%	18,690,294	43547	257926	4.62%	44,014,021	43064	607393
7	6,848,682	3.09%	35158	94512	3.09%	7,626,702	35140	105248	3.08%	8,469,032	35121	116873	3.07%	12,116,880	35063	167213	3.05%	29,108,029	34971	401691
8	6,392,996	2.88%	33968	88223	2.88%	7,126,147	33967	98341	2.88%	7,919,995	33964	109296	2.88%	11,358,222	33947	156743	2.87%	27,376,239	33907	377792
9	6,190,762	2.79%	33427	85433	2.79%	6,903,918	33433	95274	2.80%	7,676,163	33437	105931	2.80%	11,020,987	33439	152090	2.79%	26,605,430	33422	367155
10	4,260,232	1.92%	27729	58791	1.93%	4,779,355	27817	65955	1.95%	5,341,991	27893	73719	1.97%	7,780,700	28097	107374	2.01%	19,160,227	28323	264411
11	4,082,845	1.84%	27146	56343	1.86%	4,583,780	27242	63256	1.87%	5,126,771	27326	70749	1.90%	7,480,575	27550	103232	1.94%	18,466,231	27801	254834
12	3,976,738	1.79%	26791	54879	1.81%	4,466,757	26892	61641	1.82%	4,997,959	26980	68972	1.85%	7,300,810	27217	100751	1.89%	18,050,106	27483	249091
13	3,855,275	1.74%	26379	53203	1.75%	4,332,763	26486	59792	1.77%	4,850,431	26579	66936	1.80%	7,094,792	26830	97908	1.84%	17,572,786	27114	242504
14	3,818,847	1.72%	26254	52700	1.74%	4,292,570	26363	59237	1.75%	4,806,171	26458	66325	1.78%	7,032,957	26713	97055	1.83%	17,429,428	27002	240526
15	3,669,563	1.66%	25735	50640	1.67%	4,127,815	25852	56964	1.68%	4,624,710	25953	63821	1.72%	6,779,293	26227	93554	1.77%	16,840,880	26537	232404
16	3,339,464	1.51%	24551	46085	1.52%	3,763,276	24684	51933	1.54%	4,222,979	24800	58277	1.58%	6,216,840	25115	85792	1.63%	15,533,065	25476	214356
17	3,284,296	1.48%	24347	45323	1.50%	3,702,317	24483	51092	1.51%	4,155,769	24602	57350	1.55%	6,122,615	24924	84492	1.61%	15,313,565	25294	211327
18	3,063,058	1.38%	23513	42270	1.40%	3,457,755	23661	47717	1.41%	3,886,022	23790	53627	1.46%	5,744,043	24141	79268	1.51%	14,430,394	24546	199139
19	2,984,208	1.35%	23208	41182	1.36%	3,370,548	23361	46514	1.38%	3,789,793	23494	52299	1.42%	5,608,829	23855	77402	1.48%	14,114,431	24273	194779
20	2,933,353	1.32%	23009	40480	1.34%	3,314,291	23165	45737	1.36%	3,727,703	23301	51442	1.40%	5,521,538	23669	76197	1.46%	13,910,296	24095	191962
21	2,912,614	1.31%	22928	40194	1.33%	3,291,346	23084	45421	1.35%	3,702,376	23222	51093	1.39%	5,485,920	23592	75706	1.45%	13,826,967	24022	190812
22	2,820,495	1.27%	22562	38923	1.29%	3,189,406	22724	44014	1.31%	3,589,834	22866	49540	1.35%	5,327,567	23249	73520	1.41%	13,456,241	23694	185696

23	2,776,788	1.25%	22387	38320	1.27%	3,141,028	22551	43346	1.29%	3,536,412	22695	48802	1.33%	5,252,354	23085	72482	1.39%	13,280,005	23537	183264
24	2,648,865	1.20%	21865	36554	1.21%	2,999,383	22037	41391	1.23%	3,379,952	22187	46643	1.28%	5,031,889	22595	69440	1.34%	12,762,845	23069	176127
25	2,537,728	1.15%	21402	35021	1.16%	2,876,262	21580	39692	1.18%	3,243,894	21736	44766	1.23%	4,839,941	22160	66791	1.29%	12,311,838	22653	169903
26	2,523,756	1.14%	21343	34828	1.16%	2,860,778	21522	39479	1.17%	3,226,780	21679	44530	1.22%	4,815,781	22105	66458	1.29%	12,255,019	22600	169119
27	2,353,273	1.06%	20609	32475	1.08%	2,671,779	20799	36871	1.10%	3,017,793	20965	41646	1.15%	4,520,446	21416	62382	1.21%	11,559,497	21942	159521
28	2,142,725	0.97%	19337	29570	0.99%	2,436,163	19722	33619	1.00%	2,756,207	20036	38036	1.05%	4,149,921	20520	57269	1.12%	10,684,157	21086	147441
29	1,744,830	0.79%	15746	24079	0.80%	1,983,778	16059	27376	0.82%	2,244,390	16344	30973	0.86%	3,379,998	17147	46644	0.92%	8,738,427	18172	120590
30	1,548,361	0.70%	13973	21367	0.71%	1,760,403	14251	24294	0.73%	1,991,670	14504	27485	0.76%	2,999,408	15216	41392	0.81%	7,754,474	16125	107012
31	1,511,297	0.68%	13639	20856	0.70%	1,718,264	13910	23712	0.71%	1,943,995	14157	26827	0.74%	2,927,610	14852	40401	0.79%	7,568,854	15739	104450
32	1,462,426	0.66%	13197	20181	0.67%	1,662,700	13460	22945	0.68%	1,881,132	13699	25960	0.72%	2,832,939	14372	39095	0.77%	7,324,097	15230	101073
33	1,460,511	0.66%	13180	20155	0.67%	1,660,523	13442	22915	0.68%	1,878,669	13681	25926	0.72%	2,829,231	14353	39043	0.77%	7,314,509	15211	100940
34	1,385,771	0.63%	12506	19124	0.64%	1,575,547	12755	21743	0.65%	1,782,530	12981	24599	0.68%	2,684,447	13618	37045	0.73%	6,940,195	14432	95775
35	1,326,015	0.60%	11966	18299	0.61%	1,507,607	12205	20805	0.62%	1,705,665	12421	23538	0.65%	2,568,690	13031	35448	0.70%	6,640,925	13810	91645
36	1,091,409	0.49%	9849	15061	0.50%	1,240,874	10045	17124	0.51%	1,403,890	10224	19374	0.54%	2,114,224	10726	29176	0.57%	5,465,978	11367	75430
37	1,058,736	0.48%	9554	14611	0.49%	1,203,726	9745	16611	0.50%	1,361,861	9918	18794	0.52%	2,050,931	10404	28303	0.56%	5,302,343	11026	73172
38	879,862	0.40%	7940	12142	0.40%	1,000,356	8098	13805	0.41%	1,131,775	8242	15618	0.43%	1,704,426	8647	23521	0.46%	4,406,511	9163	60810
39	874,691	0.39%	7894	12071	0.40%	994,476	8051	13724	0.41%	1,125,122	8194	15527	0.43%	1,694,407	8596	23383	0.46%	4,380,611	9110	60452
40	850,390	0.38%	7674	11735	0.39%	966,848	7827	13343	0.40%	1,093,865	7966	15095	0.42%	1,647,334	8357	22733	0.45%	4,258,910	8856	58773
41	816,211	0.37%	7366	11264	0.38%	927,988	7512	12806	0.38%	1,049,899	7646	14489	0.40%	1,581,123	8021	21819	0.43%	4,087,732	8500	56411
42	790,763	0.36%	7136	10913	0.36%	899,054	7278	12407	0.37%	1,017,165	7407	14037	0.39%	1,531,826	7771	21139	0.42%	3,960,284	8235	54652
43	714,974	0.32%	6452	9867	0.33%	812,887	6581	11218	0.33%	919,678	6697	12692	0.35%	1,385,013	7026	19113	0.38%	3,580,722	7446	49414
44	685,578	0.31%	6187	9461	0.32%	779,466	6310	10757	0.32%	881,866	6422	12170	0.34%	1,328,069	6737	18327	0.36%	3,433,503	7140	47382
45	677,100	0.31%	6110	9344	0.31%	769,826	6232	10624	0.32%	870,960	6343	12019	0.33%	1,311,645	6654	18101	0.36%	3,391,041	7052	46796
46	657,794	0.30%	5936	9078	0.30%	747,876	6054	10321	0.31%	846,126	6162	11677	0.32%	1,274,246	6464	17585	0.35%	3,294,353	6851	45462
47	638,638	0.29%	5763	8813	0.29%	726,097	5878	10020	0.30%	821,486	5982	11337	0.31%	1,237,138	6276	17073	0.34%	3,198,417	6651	44138
48	605,919	0.27%	5468	8362	0.28%	688,898	5577	9507	0.28%	779,400	5676	10756	0.30%	1,173,757	5955	16198	0.32%	3,034,556	6310	41877
49	599,512	0.27%	5410	8273	0.28%	681,613	5518	9406	0.28%	771,158	5616	10642	0.29%	1,161,345	5892	16027	0.32%	3,002,465	6244	41434
50	598,703	0.27%	5403	8262	0.28%	680,693	5510	9394	0.28%	770,117	5608	10628	0.29%	1,159,778	5884	16005	0.31%	2,998,414	6235	41378