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Flora Whitepaper

IDEOLOGICAL INTRODUCTION

The unstoppable development of technology is a perpetuum mobile for the world. A drive that through progress drives further progress, breakthrough after breakthrough. However, it cannot be said that this is a good operating model. Technological progress comes at a great cost in terms of environmental degradation and climate change, which could in the long term destroy most of what has been achieved so far. Flora believes that technological progress should be balanced in such a way that for every planet-destroying side-effect, in parallel, an antidote must be created in the form of another technology or a new application of an existing one. Awareness of limitations, resulting from the intrinsic nature of humanity, leaves us under no illusion that it is impossible to convince everyone of this concept. Therefore, there is nothing left to do but to create a counterbalance from below to the unreflective pursuit of efficiency at the expense of ecology.

This is why the Flora blockchain, which is a fork of the low-carbon CHIA blockchain, will be used to build many solutions for the well-being of the planet. One of the first

projects to go in the direction of taking care of the environment is the creation of a platform which will be used to acquire in a decentralized manner environmental data, such as air quality, in every corner of the globe. Most importantly, the platform will be based on blockchain technology and all the benefits that arise from its use.

As a project, utilizing blockchain technology for the implementation of our assumptions, we are fully aware of the need for limited trust in centralized intermediaries and third-parties that carry out similar projects. The nature of their organizational model casts a shadow over certain sensitive aspects of their operations. We believe that Satoshi Nakamoto's legacy will remove the impact of human imperfections in this area as well. We pay our respects to the sacrifices made by non-profit organizations and others working to improve the environmental condition. At the same time, we are aware of the risks of putting control of data in the hands of a few leading institutions, or worse, governments and large corporations. In this predicament, it is essential to share the responsibility for data authenticity with the public. With a decentralized platform and IoT solutions, we intend to provide the general public with a tool and a database to securely capture, store and share information.

WHAT IS FLORA

Flora was born on 30.06.2021 as one of the most promising chia forks, due to the smooth start and development team helping farmers with any new problems. It was created by the cooperation of farmers and their willingness to co-create the Chia community. Flora is an eco-friendly cryptocurrency using Proof of Space and Time cryptographic technique and powerful and secure Chialisp language for developing Smart Contracts.

Our team consists of many experienced personalities. Thanks to this, we are able to function and operate in many fields, from programming work, building blockchain functionalities to listing it on the largest cryptocurrency exchanges. Blockchain technology is distributed, robust, secure, and instant. We claim that because blockchain technology is decentralized, it will be protected from outside forces such

as government manipulation, censorship, fraud, and terrorism. We argue that because there is no central server, a hacker cannot pull all of the information down, or connect to the network and alter it. We believe that Blockchain is highly secure due to the extreme amount of oversight by users. Although it is still a new technology, many investors and businesses are beginning to adopt it as an innovative form of exchange. It's important to understand that blockchains are not only for trading or speculative purposes; they are the foundation of the future. In time, when Flora takes off, and people actually use it, then it will be a very good start to creating a real, solid network.

Flora as a part of Chia fork family

Chia forks have created their own ecosystem thanks to the additional use of Chia plots. This is undeniably the reason why this organic cryptocurrency is so unique. Undoubtedly, farming forks is profitable, we gain the possibility of additional income without investing new funds. However, you should be careful and choose forks that are valuable projects. Through our activity we want to increase the popularity of Chia. Undoubtedly, this is an opportunity for farmers, who by investing in their farms will be able to fully exploit their potential. We strive to make our project credible to you and increase revenue opportunities through value building based on solid projects.

Flora's crucial contribution to farmers of Chia and its forks

Team Flora also wants to ensure the comfort and full satisfaction of farmers through the usage of our blockchain as well as other forks. One of the biggest problems with co-farming Chia plots was the lack of full rewards for NFT plots due to design decisions within the Chia team. To meet the high demands of the community and to provide added value, we used our know-how and, as the first and only Chia fork (at the time of writing), created an open-source tool called FLORA-DEV-CLI that allows you to get full reward when using NFT plots that are compatible with any fork. Our tool has been very well received throughout the Chia fork community, and as a result, third-party adoption has begun, in line with our assumptions and predictions. Our

tool has been used in many places (e.g. Machinaris.app), and is recommended by virtually every fork as the go-to for releasing rewards. To maximize its potential, we have also partnered with alltheblocks.net, an explorer of all forks, to create a reward release tool centrally from one place and give every farmer the chance to do it, regardless of skill.

TECHNOLOGY

Flora Network is a fork of the Chia Network. This more or less means that it is a copy of the original Chia blockchain, adapted to create its own tool on an autonomous blockchain. The features of the Chia Network architecture make it an ideal environment for the pro-environmental solutions that we intend to implement on its twin blockchain – the Flora Network.

Decentralization and environmental aspects

Flora is one of the most eco-friendly blockchains, while at the same time being a highly scalable network that can certainly shoulder many of the solutions and projects that will be created by our customers. As a mission-driven team, we hope to attract interest from many different industries. We are absolutely not confining ourselves to the areas already addressed in other whitepapers. As a layer-1 network, we want to create an open environment to build projects from as wide a spectrum of known fields as possible, such as from DeFi, NFT, GameFi, AI solutions or metaverse, as well as delve into yet undiscovered applications for blockchain. By encouraging new projects and bringing existing projects into our ecosystem, we want to help decarbonize (with no loss to security) the blockchain industry and raise awareness in this aspect (thus putting competitive pressure on more environmentally harmful projects), while being an ecosystem that lacks nothing compared to other similar networks.

Flora blockchain, like the Chia blockchain, is based on the Proof of Space and Time (PoST) consensus algorithm, an alternative to the highly energy-intensive Proof of Work (PoW) and the popular, but less secure than the aforementioned PoW, Proof of

Stake (PoS). By using existing resources and technology implemented by Chia, we have the ability, if necessary, to act as a point of scalability with full functional interoperability of the Chia blockchain. In addition, by using the same plots, we do not contribute to the increase in carbon footprint.

1. Proof of space

Proof of space can be seen as a mechanism to indicate that you have some unused space on your hard drive. Flora blockchain users will utilize that free space by installing software that aggregates a set of cryptographic data on the drive in the form of plots. When the blockchain broadcasts a challenge for the next block, farmers can check their plots to see if they have the hash that is closest to the challenge. The chance of a farmer winning a block is the ratio of the total area the farmer has to the size of the entire network.

2. Proof of time

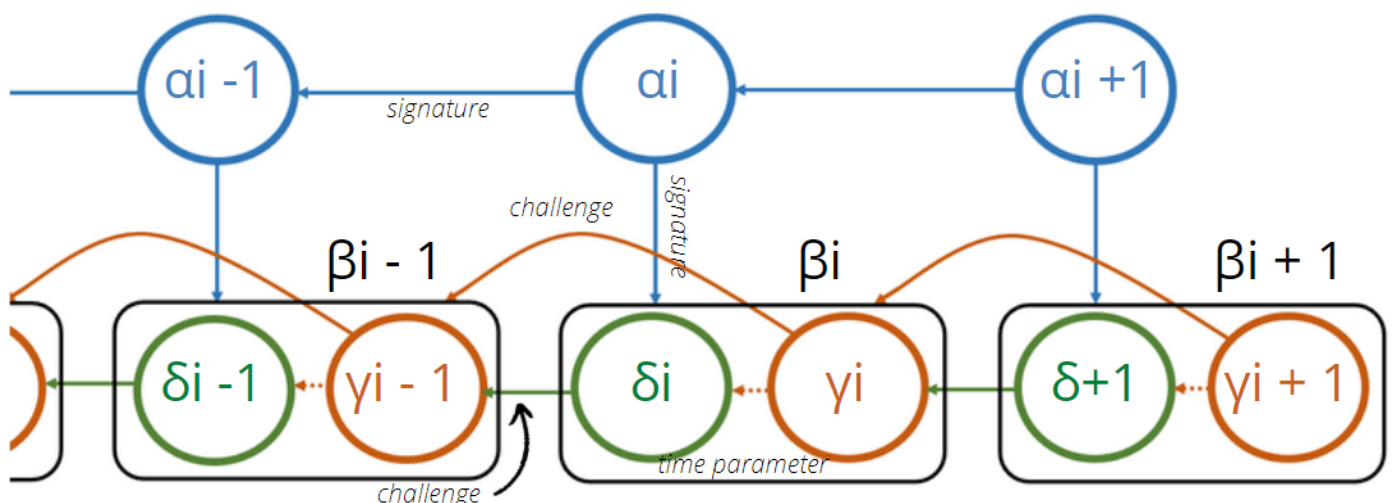
It only takes a while for the time proof to pass between blocks. This is achieved by using a verifiable delay function that takes a finite amount of time to compute and includes a terribly fast verification. The main concept of VDF is that it requires computation, and since there are various parallel computers without any blessings, it reduces energy waste. Although there may be a limited range of VDF servers, the fastest one is always finished first, requiring merely a fast Timelord and completing only 1 block before the chain can run.

3. How it works

The Proof of Space and Time protocol allows the Flora Network to be reliable in operation, decentralized, and virtually indestructible. Transaction blocks in the network are created and validated thanks to the free drive space of ecosystem users (farmers). Farmers designate on their disks so-called plots, with capacity depending

on its type, characterized by K-size, on which cryptographic data is stored. Similar to Proof of Work, the farmers have to provide proof to the network by "solving" a mathematical puzzle, which consists of finding the searched value in what is known as a "challenge". In the case of Proof of Space however, solving a challenge is much simpler, which is why it doesn't require huge amounts of computing power to provide a solution. For a new transaction block to be written to the chain, it must be accepted by one of the farmers. In order to randomly select a validator, the network scans all plots for the sequence of numbers that most accurately characterizes the puzzle in question. The farmer whose plot contained the desired string wins the block, which is then validated, and the farmer receives a prize. The security of the network is aided by the fact that there is a low probability that a single farmer will be responsible for accepting multiple blocks.

Proof of Time serves as an additional safeguard, implemented in the network, implemented under the name of Verifiable Delay Function (VDF). These are deterministic functions (always rendering the same result, using the same parameters), which guarantee that the time between blocks will be consistently mutually synchronized, or in other words, a sequence of blocks mutually related in time will be created. VDF protects against possible attacks from entities with the ability to use high computing power in order to manipulate the network and, for example, double the issuance of tokens. To this end, attackers could create a fake chain, assuming the use of only Proof of Space. Therefore, in addition to the PoS itself, there must be a separate control element. Validation of a block from the PoT perspective is handled by so-called Timelords. For a block to be completed, only one of them is required.



$B = (\delta, \gamma)$ in the ungrindable trunk chain contains a proof of space followed by a VDF output γ . A block α in the foliage contains the payload, a signature of the previous block in foliage, and a signature of the proof of space.

4. Ecological aspect of PoST

By using PoST, tools built on the Flora blockchain will be able to base their operations on a network that is both secure and decentralized (like PoW) while being highly scalable (like PoS). Due to the nature of the project, the consensus was chosen to be as lightweight as possible. Unlike Proof of Work, PoST does not consume energy on the level that would match the demand of many medium-sized countries. The entire Chia network, which includes most of its forks, currently consumes about 0.307 TWh of energy per year (as of 15.12.21). For comparison, the Bitcoin network consumes 91 TWh per year (about 0,004% of the global consumption (~23000 TWh) of electricity). It is important to note here that energy intensity is not a determinant of decentralization. Although Proof-Of-Work based cryptocurrencies, such as Bitcoin and Ethereum, are considered to be the most secure and decentralized, the Chia network beats them in these respects. Bitcoin currently has over 15,000 active nodes. Ethereum has even fewer at less than 6,000 nodes. And Chia? The Chia network supports as many as 350,000 nodes! Thus, the incomparably low energy intensity of the network in no way goes hand in hand with a reduced level of decentralization. Quite the opposite, actually. The issue of sourcing and recycling the hardware used to support the network also serves as a significant advantage. Satoshi Nakamoto was mistaken in thinking that Bitcoin would be mined using "free computing power resources". It very quickly became apparent that instead of relying on unused CPUs and GPUs, people started building complex ASICs, used solely for mining the "digital gold", as the used ones are no longer reusable. Satoshi's vision is more suited to the PoST protocol, which has much greater potential in utilizing free drive space in thousands of server rooms and home drives around the world. Moreover, drive space, used to support the network, can be delegated to another function at any time (unlike, e.g. ASICs)

Summary of equations

$$P_{high-cap} (MW) = Netspace (EiB) \times (1024^6) / (1000^4) \times TB / W(P_{high}) / 1000^2 \times \% Netspace high-cap$$

$$P_{low-cap} (MW) = Netspace (EiB) \times (1024^6) / (1000^4) \times TB / W(P_{low}) / 1000^2 \times \% Netspace low-cap$$

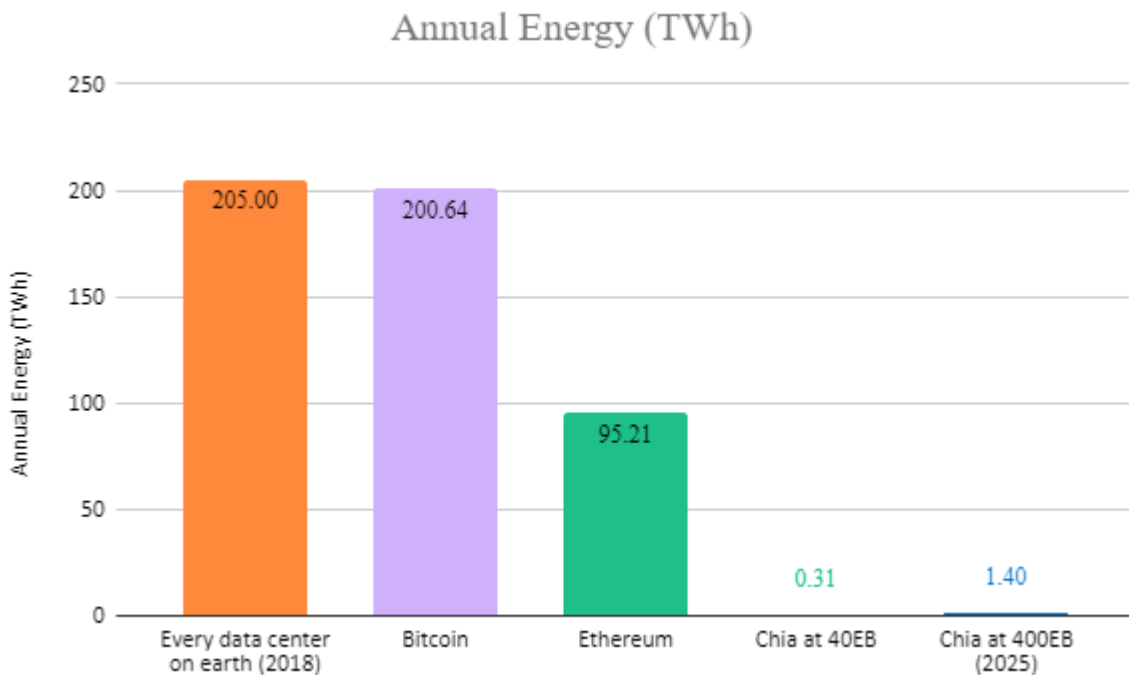
$$P_{underutilized} (MW) = Netspace (EiB) \times (1024^6) / (1000^4) \times TB / W(P_{under}) / 1000^2 \times \% Netspace under$$

Total power of the Chia network

$$P_{Total} = P_{high-cap} + P_{low-cap} + P_{underutilized}$$

Annual energy consumption

$$E_{annual} = \sum_{t=0}^{1 year} P_{Total} \times 24 \times 365 + (Netspace (TiB) \times P_{plot} (kWh / TiB plotted))$$



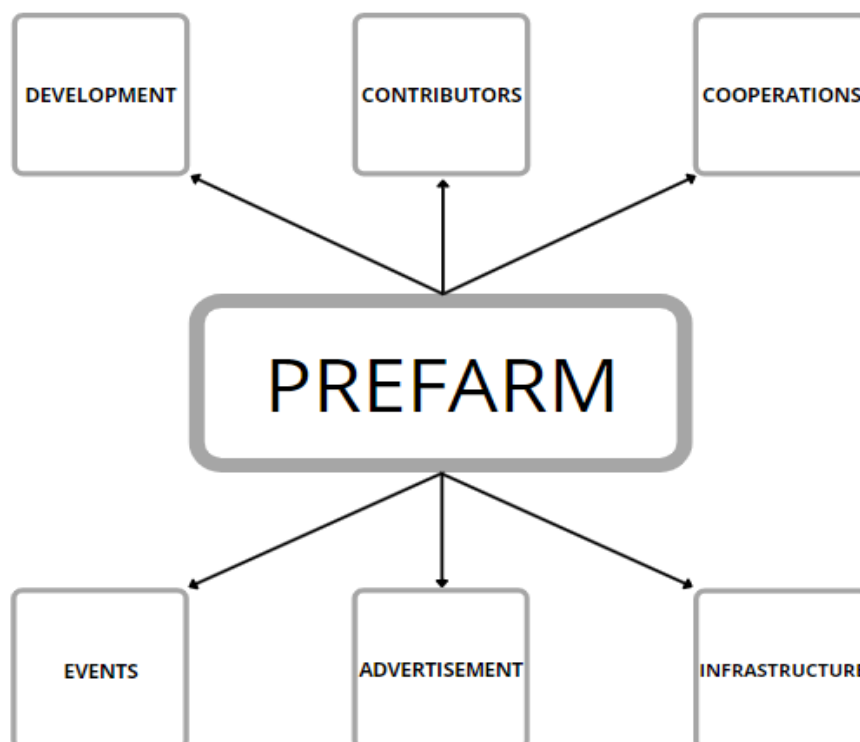
Sources

1. [Digiconomist Bitcoin Energy Consumption Index]
(<https://digiconomist.net/bitcoin-energy-consumption>)
2. [Ethereum Energy Consumption Index]
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3. <https://chiapower.org/>

5. Prefarm

We do not aspire to run an IPO or to create a big financial organization like Chia. As such, a big prefarm isn't required. Our support is planned to run continuously and our strategic reserves are enough to compensate developers and other employees in the long run. We calculated that they would be enough until our project was self-financed.

The prefarm value is 250k blocks, which we intend to use for developer payments in the initial phase of our blockchain development. We believe that this amount will be enough to fund our needs until we obtain external funding. This amount has been chosen because we believe that a prefarm that is too high could raise alarms about a potential pump-and-dump scheme, and one that is too low may block the development of the project in its early stages.



6. Chialisp

Chialisp is a new programming language, built on top of the not-so-popular LISP language. It is the main tool for creating decentralized applications on the blockchain, both on Chia and Flora. Chialisp features a high level of security, and it is easy to audit a program written with it.

With Chialisp, it is possible to create so-called "smart coins", which are equivalent to smart contracts used on other blockchains. In essence, smart coins are an extension of smart contracts with "smart transaction capabilities". The Chialisp language is designed to be as interoperable as possible. The functions created with it are intended to be as close as possible to features known from the world of traditional digital finance (centralized). Thanks to the use of Chialisp, it is possible to construct a network that makes it possible, for example, to undo already accepted transactions or to make the release of funds dependent on the execution of an AML/KYC (Distributed Identity) procedure.

Flora GlobeCare Platform

One of our goals is to create a decentralized platform that would serve as a hub for collecting and sharing air quality data, with the goal being to cover every corner of the globe, if the community grows to an appropriate size. The key task of the platform will be to provide complete, indisputable and auditable information about air quality in a given area, thanks to data provided by the community. The platform will acquire data from volunteers, reusing already available sensors. Like most projects based on blockchain technology, Flora seeks to eliminate the need for a

third-party. However there is a significant problem when it comes to acquiring air quality data due to a lack of a sufficient number of sensors and a high probability that they are badly placed i.e., near sources of large amounts of exhaust fumes, which do not necessarily correspond to the nature of the immediate surroundings of such a source, or in urban green areas, where air quality may be artificially inflated.

In order to combat sloppy measurements, manipulation and limited access to reliable data for ordinary people, we have prepared a comprehensive plan to solve the above-mentioned problems and to introduce several mechanisms for raising environmental awareness to the local governments and private enterprises. We have already identified a number of areas in which the proper analysis, processing and guarantee of incontestability of the environmental data provided can play a significant role. Some of them remain in the theoretical sphere. However, there are a range of manufacturers' service providers of a particular equipment with whom the discussion has reached an advanced stage.

Platform specifics

The platform will bring together a community of people who are open to sharing data about air quality in their environment. There is already a large community, numbering in the hundreds of thousands, who own devices that measure air quality (e.g. Fibaro). Some of them share this type of data when they integrate IoT devices with their smart home via platforms such as Home Assistant or openHAB. The growing popularity of smart homes will only increase the number of people using high-quality air sensors, which creates an attractive growth prospect for us.

The platform will rely on three sources of data acquisition. As we aim to build a large community around Flora, we hope that it will be the main source of data acquisition for the platform. All community participants, from sensor owners to those planning to purchase sensors to smartphone users, will be able to contribute to a decentralized and publicly accessible global air quality database.

We especially hope that more and more mobile device manufacturers decide to install components in their products dedicated to this kind of measurement. Thanks to this, we will be able to equip as many people as possible with a dedicated application that will make use of such components, so that they can provide data to the platform in exchange for compensation in tokens (the reward program will be inactive during the testnet phase). In the future we also intend to develop our own hardware in the form of a tokenized sensor. It will allow community members to acquire platform tokens in an analogous way, sharing data about the air quality in their environment.

Our platform's second pillar will be sourcing data from similar centralized platforms, where users share air quality data and from IoT device integration platforms whose users are also in possession of sensors (including air quality meters). By combining three streams of information contributed directly by our project community, along with existing databases and the third pillar, we have the opportunity to create a massive, and most importantly, well-diversified by source, air quality information hub.

We want to base the third pillar on another blockchain project - Helium. Helium is a decentralized peer-to-peer network based on a network of hot-spots shared by the community, but also various sensors. These include air quality sensors, which makes Helium, or rather its community, a natural partner for us. We intend to integrate our platform with the data stream provided by Helium's sensor users to redirect relevant information to our platform.

The data storage layer will be based on a map with designated districts, in the form of a radius of a certain value, where the sensors are operating. Each user will be able to check the air quality information of the selected sensor area.

Use of the platform by companies and large entities

The burden of having a negative as well as a positive impact on air quality rests on everyone, but the biggest role is played by large entities, such as local governments, whose regulations affect the local biosphere, and companies, on whose environmental policy depends the impact on the environment. For this reason, we intend to place particular emphasis on cooperation with local authorities and entrepreneurs (owners of factories, production plants, real estate developers and so on).

As part of the interaction with local communities, we would like to implement an air quality certification mechanism for each area. Such a certificate would be issued based on data collected on the platform, in the form of an NFT token with an expiration date. As an example, a local government or a developer, wanting to encourage potential new inhabitants to move to their city or to buy an apartment in a newly-built housing estate, could have such a certificate in order to signify a good air quality in the region. The process of popularization of certificates would introduce a mechanism of ecological competitiveness in many industries as well as at the local level, encouraging entities to invest in improving the quality of the local biosphere.

COMPANY VISION

1. GlobeCare platform development

Currently, one of our main goals is to implement and develop a project in the Flora ecosystem known as the GlobeCare platform. We believe that blockchain can have a very positive effect on the quality and wide access to environmental data, which in the long run will allow us to move even faster towards a green transformation around the world.

2. Building a fully functional layer-1 network

We here at Flora team believe that it is the community that has the biggest impact on growth in the cryptocurrency space. As such, we want to reserve space for other great projects. Flora blockchain is a fully functional layer-1 network where community members can pursue their own projects. We are absolutely not closing ourselves off to any domain that has found its way into blockchain implementation.

3. Integration with other blockchains

Flora is a cryptocurrency project that wants to build an ecosystem for next-generation decentralized applications. Flora is a blockchain designed for data, and we want to provide a bridge that connects this chain to other blockchains. Flora can enable seamless communication between its users and other blockchains.

4. Cooperation with local governments and private entities

Team Flora has already begun discussions with many private entities to help us implement our ideas. We are sure that the increasingly popular idea of green transformation will attract many private companies and corporations to cooperate with us. We are also very much open to cooperation with local governments.

As a fully-fledged, fully functional and interoperable blockchain, Flora offers local governments as well as various businesses a wide range of applications for blockchain technology, such as in the field of ecology or in other low-carbon blockchain applications.

5. Opportunity to work with large companies

Working in cooperation with large companies and corporations is an unquestionable advantage and the driving force behind every project. In our team there are people with great business knowledge and connections in various market spheres. We have already started discussions with companies about possible cooperation and real use of tokens based on Flora or Flora cryptocurrency itself. However, we want to take it slow and carefully, follow the already defined path of development in order to announce these partnerships at the right moment and finalize them in the next step.

DEVELOPMENT PLAN

1. Growth & Stability

As a basis for taking the next steps, we need to increase the number of users to increase security and stability of our blockchain. Achieving this will allow us to further pursue development by obtaining external funds. As part of the consumption of coins from the prefarm, we plan to develop applications that will allow communication with the chain or multiple chains.

2. Plans for the near future

We want to utilize the prefarm as a method of accelerating the project, i.e. to create the slash functionality of the application, which due to the fact that it is an API or a rest API, will allow the interaction with various other blockchains. With that, Flora could effectively function as a layer-2 network and enable us to work on various different projects. Each project released will have its own documentation. We have a couple of ideas that are in the development phase. However, we are not yet ready to provide further details on them. All the

information about our future project will be provided on our social media and on the blog on our website.

3. Target group

Our main target group we want to reach are Chia farmers who, thanks to Flora, can effectively co-farm, i.e., increase their potential profit without the need for any additional investments in their farming infrastructure. We also wish to reach people who are interested in Chia and Flora solutions, such as companies or other private entities. Another target group we want to reach are people who care about the environment as this lies at the core of what Flora seeks to achieve. We hope our activity will attract the attention of people who have unused drive space and want to make a bit of profit for themselves, as well as encourage them to become interested in projects that utilize these solutions like Flora or Chia.

4. Listing

Listing on a major exchange (and we don't intend to stop at just one) is the crowning achievement for any self-respecting cryptocurrency. We believe that our project is able to measure up to the market's fair judgment with regards to its value. We also want to provide the community with the broadest and most accessible way to share in the success of this project, which of course means profiting from partaking in it.

5. Exploring new applications for tokens on the Flora network

As a largely community-based project, we want to make tokens developed on our network as usable as possible, both for the people supporting the project and for ventures based on our network. Therefore, we intend not to stop with what we have done so far, what we are currently implementing and what we

have in the pipeline. Our project is open to new uses for tokens on our network.

We are currently thinking about using tokens as compensation for users of the GlobeCare platform who will share their data. There are also many other applications that we would like to implement that already exist on other blockchains, but are not created in harmony with nature. We are committed to enriching and reinventing existing solutions in a way that is not harmful to the climate and the environment.

6. AI utilization as the foundation of the platform

Artificial intelligence is something we are particularly interested in when it comes to managing the data collected on the GlobeCare platform. Therefore, we plan to implement AI solutions that will serve, among other things, to sift through the noise among the information provided by the users of the platform. There are also a few other revolutionary artificial intelligence solutions that we would like to implement.

7. Combining Proof of Coverage with Flora blockchain

Proof of Coverage (PoC) is a new work technique for the Helium Network that proves network connection and Hotspot placement. If the network connectivity and location of the Hotspot are validated, the participants of this procedure are compensated. The amount of dependable coverage that a physical wireless network can provide for users installing low-powered connected devices on it determines its success. The Helium Network's Proof of Coverage consensus technique makes use of the advantages of radio frequencies to provide meaningful proof. It incentivizes anybody to deploy a Hotspot and earn HNT for creating the network and delivering device data at a tenth of the cost of cellular. Hotspots also operate as miners on the Helium blockchain. Using the "PoC Challenge" technique, the blockchain continually examines the Hotspots.

To put it another way, the Proof of Coverage method is a definitive proof of wireless coverage given by Hotspots on the Network. The Helium Blockchain maintains the data generated by this continual network connection and coverage verification. The Helium Blockchain uses a Proof of Coverage mechanism to validate network connections and hotspot location. Proof of Work, on the other hand, is a cryptographic proof in which one person demonstrates to others that a specific amount of computing work has been put in. Traditional PoW mining rigs utilize GPUs or ASICs, however Helium Network's Proof of Coverage uses Radio Technology. Helium miners are simple to install and set up since they come in plug-and-play kits, whereas other Bitcoin miners require more technical know-how. PoW also requires a large amount of processing power for task confirmation, whereas PoC does not.

Conclusion

Flora, as an ambitious team, wants to use the potential of blockchain technology, both Chia and Helium. We believe that we are on the right track to creating a fully functional tool capable of combining the two. The utility of this solution is huge. We think that it will also be used in our GlobeCare project. We want to utilize Helium, as it is mined using Hotspots, which we are able to use to read important data, which will be saved on the Flora blockchain.

8. Research into new applications for blockchain technology and further development of already existing technologies

As blockchain technology evolves with each passing day, it is certain that there are still thousands of new applications for Satoshi Nakamoto's invention. The bull market of 2017-18 brought to the cryptocurrency market many new projects that provided innovative and previously unknown solutions. Over the course of 3 years, it became clear that blockchain

technology was not only applicable in replacing traditional payment methods and reducing the money supply. In the depths of the recession, innovations such as NFT or DeFi, whose markets are currently worth billions, came to light.

We believe that this is not yet the peak of what these branches of blockchain technology can achieve, let alone even blockchain technology in general. That is why we will be exploring new implementations within DeFi to expand the possibilities of decentralized finance. Not every element of the centralized finance world has been able to be successfully transferred to the blockchain, which in our opinion should be done!

The same is true for Non-Fungible-Tokens. NFTs have already experienced their first boom, but they are also one of the youngest branches of blockchain technology. When the dust settles, we will explore completely new applications for non-fungible tokens. We are confident that the irreplicability that NFTs possess will find their applications in many aspects of life and in many industries, not just for the arts or the metaverse.