



G R N

greenpaper v2

25 February 2022

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Now that's out the way
let's continue!

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1. introduction

Since its beginnings, the blockchain industry has been a source of contention due to its wasteful use of power and resultant e-waste. The carbon footprint, along with other shortcomings, prevent them from acting as a viable alternative to the current centralized system or for wider adoption.

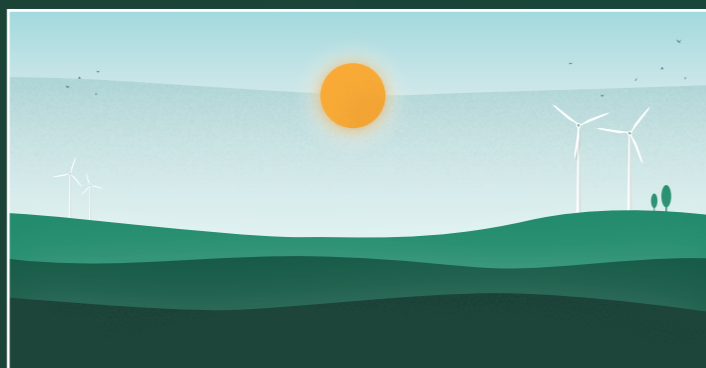
We aim to combat these issues by introducing GRN GRID and its native token GRN (GRN is pronounced as Green).

Through the use of its novel and unique Proof of Stake v2 algorithm, GRN Grid is designed to be an energy-efficient, high performance, low fee smartchain that actively supports decentralization and security.

Since our technology enables green-only transactions, Grid emerges as the first smartchain to be created with the capability of operating entirely on renewable energy sources. Furthermore, Grid incorporates several notable features, such as an integrated payment and escrow system, swapping pools, and encrypted chat between users. No permission is required for the functionality, and the Grid validator nodes are decentralized and permissionless.

The GRN token serves multiple use cases in Grid, including staking, paying for fees and validators incentives. Furthermore, GRN token is also used to promote the adoption of renewable energy by the usage of GRN token in the operations of a renewable energy and mining company.

Grid's objective is to accelerate the adoption of renewable energy in blockchain technology and to provide every company and person with the opportunity to "go green" as soon as WEB3.0 is universally embraced. Additionally, the progressive distribution of GRN for validation supports sustainable development and discourages wealth build-up. These characteristics position GRN as a viable alternative to existing (de)centralized technology.



1.1 GRN Association

The GRN Association is a non-profit initiative of GRNBI B.V. to ensure the sustainability of blockchain technologies. GRNBI HQ is based in the Netherlands and will hand over assets correlated to Grid and GRN to the GRN Association. The GRN Association will be established in Switzerland.

Overall, the GRN Association safeguards the vision of sustainability within the GRN community. Moreover, it will also be responsible for keeping the decentralized nature of the blockchain intact.

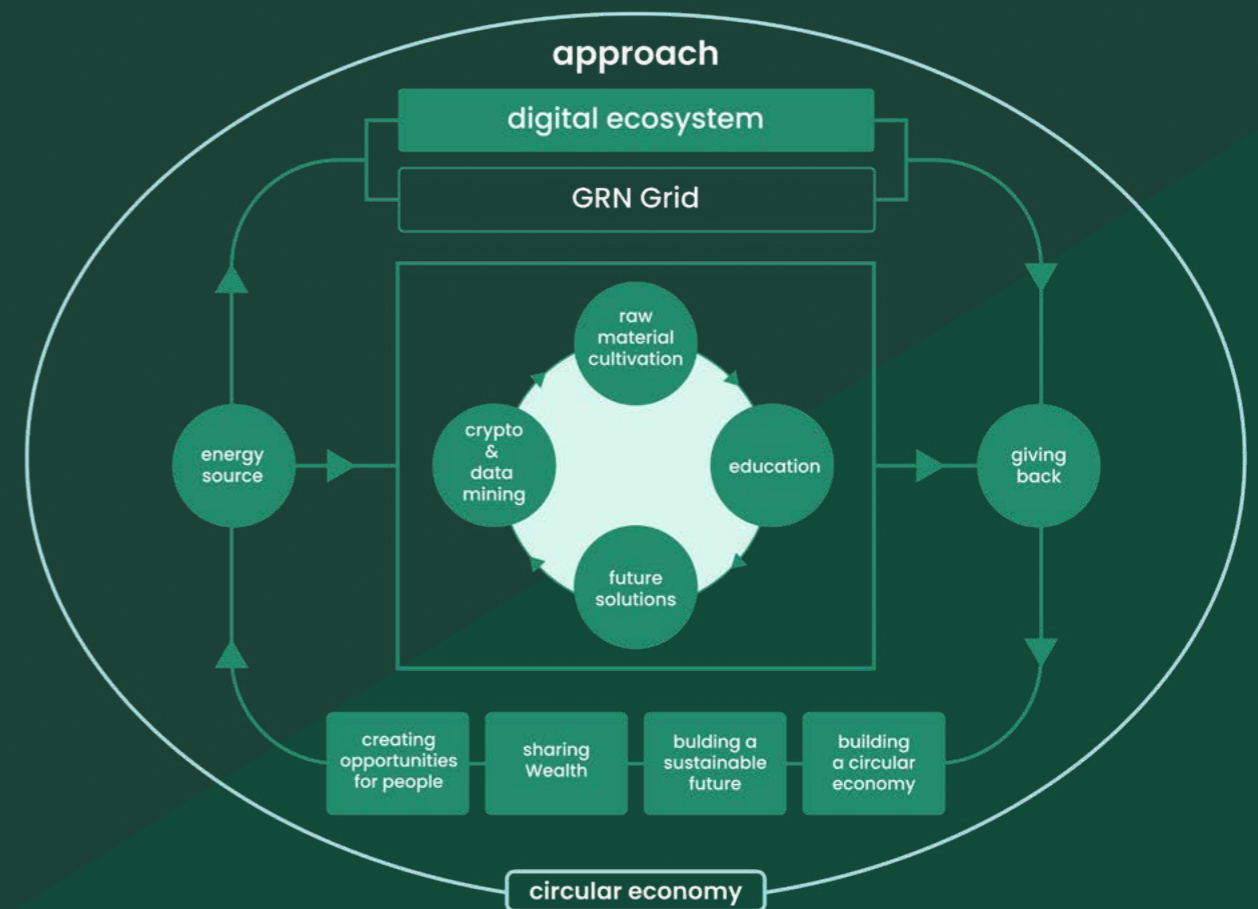


figure 1: GRNBI's circular vision



2. blockchain

Blockchain is a shared, immutable ledger used to record transactions and assets within a network. These assets can be anything tangible or intangible. Blockchain technology is widely known for its capability to be decentralized and “trustless”, see Nakamoto (2008).

In the blockchain sector, “trustless” simply implies that you do not have to invest your whole trust in a stranger, institution, or other third parties in order for a network or payment system to operate.

At its core, blockchain is an open, decentralized ledger that permanently records transactions between two parties without needing third-party authentication. This creates an extremely efficient process, and one people predict will dramatically reduce the cost of transactions.

Furthermore, decentralised blockchain technology forms the backbone of the transition to Web3. In essence, Web3 represents the new iteration of the World Wide Web that incorporates decentralization based on blockchains. Web3 is the solution to the Big Tech problems that are becoming more prevalent every day. However, using blockchain to replace the existing centralized systems introduces a new set of challenges.

3. GRN Grid

GRN Grid is a ground-breaking blockchain technology built on the Proof of Stake V2 consensus mechanism [page 18]. Grid will mainly focus on:

- Setting a framework for creative corporate solutions
- Consumer usability
- Deployment and development of WEB3.0 applications
- Sustainability of blockchain

Grid will introduce novel features to better compete with (de) centralized technologies, detailed in [page 24]. GRN Grid, along with its features and the wallet application, is scheduled to be released according to the roadmap [page 30].

The technical details of the GRN Grid will be explained in the upcoming technical paper.

4. Environmental Challenges



4.1 challenge: energy usage

The blockchain industry has evolved over the past decade to become one of the primary energy and bandwidth consumers of the world.

Over the past decade, the blockchain industry has developed into one of the greatest consumers of energy capacity on the planet. One recent study conducted by Sadlmeir et al. (2020) has explored how decentralized blockchain technology inherently consumes more than non-blockchain based centralized systems, owing to the redundancy in data.

Just powering the current Bitcoin network consumes 0.5% of all electricity used globally. That is 7 times more than the entirety of the power used by Google (Businessinsider, 2021¹). Only 28% of that energy sourced globally came from renewable sources.

The rising energy usage of Bitcoin has sparked a fierce discussion regarding the long-term viability of the digital currency. The prohibition on cryptocurrency mining in China was imposed primarily to reduce the country's energy usage. Overall, 60% of China's energy is generated from coal, which yields astounding pollution levels. This is one of the first steps taken in a string of initiatives to achieve China's pledge to go carbon neutral by 2060, and more countries will follow (SCMP, 2021²).

Some companies have already rejected the idea of accepting cryptocurrencies due to the detrimental environmental effects (BBC News, 2021³).



4.2 challenge: e-waste and silicon shortage

Experts estimate that Bitcoin's e-waste alone adds up to 30.7 metric kilotons annually in May 2021. This is comparable to that of a small IT country such as the Netherlands, [Alex de Vries, 2021⁴]. While these estimations are deemed to be exaggerated by many, there is an undisputable hardware need in blockchain mining. This is particularly apparent in light of the present silicon scarcity.

Blockchain miners continuously cycle through short-lived hardware, which greatly impacts the growth in global e-waste. E-waste contains many toxic chemicals and heavy metals that end up in our air due to incorrect equipment disposal.

The amount of e-waste produced, in conjunction with the shortage in silicon metals, further underscores the critical need for a sustainable blockchain solution.



5. Environmental Solutions



5.1 solution: green Energy

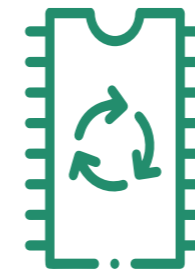
The GRN Grid smartchain has been constructed to run completely on renewable energy. By significantly decreasing its carbon footprint, Grid eliminates one of the major drawbacks of blockchain.

Moving forward, the validation of GRN Grid will be initiated by partners of GRN Energy. These partners are verified users of renewable energy only and will run GRN Grid Nodes in mining campuses across the globe. The involved parties are disclosed on the website of GRN Energy.

To encourage the usage of renewable energy, GRN introduces green certificates to validators that meet given requirements (i.e., proof their energy source is green). The verification procedure is **completely free**, and the application is accessible to **everyone without any restrictions**. The application is fully **decentralised**, hence **no gate keeping occurs**. The verifying method will be based on the latest advancements in this field, such as the paper of Knirsch et al. (2020)⁵.

Everyone is free to run validating nodes of GRN Grid to keep the decentralized nature of the blockchain intact. Certified validators will be marked as renewable nodes. End users can choose to solely use these GRN nodes for their transactions in the wallet application.

Grid allows you to delegate your GRN stake to a known validator, also referred to as the Circuit Program. This functionality allows the GRN community to help validate Grid and earn validating rewards without physically running a node. The validating community hosts these programs to attract more stakes in their nodes.



5.2 solution: circularity and recycling

We will achieve multiple goals concurrently by enforcing rigorous hardware requirements to run nodes. One of these goals is to ensure the durability of a device within the Grids system. With these hardware requirements, we extend the system's life, resulting in decreased replacement costs.

The GRN Grid will also register the devices of validators on Grid through a smart contract and penalize any validator for repeatedly changing their hardware. The exact implementation of the penalty system is elaborated in the technical paper.

Ultimately, this penalty will help combat the hardware "arms race" within the blockchain industry, which is responsible for the high e-waste, scarcity of silicon metals and the pollution caused by mining these metals.

Under its ReCharge initiative, the GRN organization will run a hardware recycling program. As a watchdog for this initiative, Metabolic will guarantee that it has the least amount of negative environmental effects possible. GRN Grid validators will be applicable to this program.



6. Security and decentralisation

6.1 challenge: security

Currently, the blockchain industry relies on validators without a clear penalty system. This exposes institutions and consumers to risk losing all their assets, like the infamous 51 attacks. Lack of active security and a transparent penalty mechanism are primary impediments to blockchain adoption.

One of the assumptions of Proof of Work (PoW) is that the most CPU power (hash rate) is in the hands of many honest operators. In reality, that is not the case. Bitcoin is a great example, as more than 53% of its entire hash rate is in the hands of just 4 distributors, which could collude in a successful attack on the Bitcoin network.

Proof of Stake assumes that those with the highest stake also benefit the most if the system keeps running smoothly. However, this concept assumes that the malevolent actor cannot benefit from a market collapse and that the bad actor did not obtain the staked tokens via deception. In addition,

this method is actively discouraging decentralization since the highest amount of wealth (highest stake) attracts the highest number of reward tokens. This means that the wealth will accumulate, and new validators are faced with high staking costs (Vitalik, 2020⁶). Under this rationale, few high-staking companies will eventually dominate the system, which is the polar opposite of decentralization.

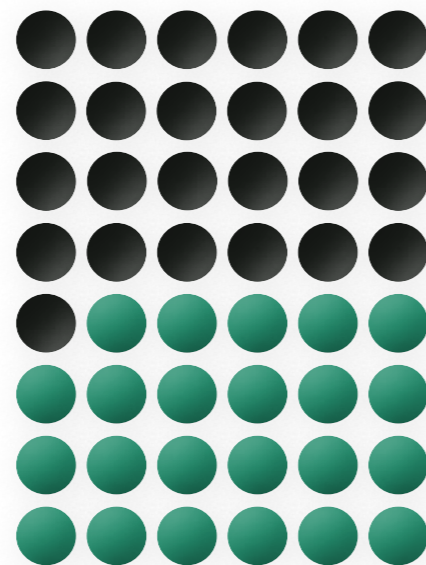
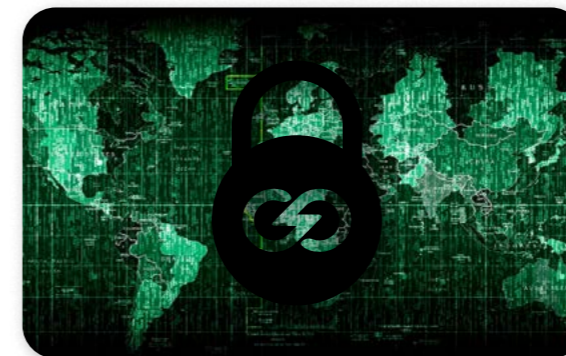


figure 2: visualisation of the infamous 51 attack



6.2 solution: security pool

The GRN Grid introduces security pools and a novel Proof of Stake2 (PoS2) consensus protocol. The advantages of security pools and PoS2 are:
Prevention of destabilisation
Prevention of accumulation of wealth
Protection against the 51% attack.



Security Pool:

Each validator will be required to stake their balance in GRN Grid's security pool to preserve the system's security. A validator will receive a non-transferable interest to a share of the pool. The security deposit will be held for 24 hours and paid out to the validator if there is no act of bad faith detected by most of the validators participating in the pool. This way, each validator will benefit if Grid runs properly without any imperfection and will be penalized otherwise.

Most importantly, each validator within a pool remains anonymous until the pool opens. This will prevent any cartel from forming within the validator community and disrupting the financial equilibrium. Also, the stake of one validator can be split into multiple pools to ensure that no single validator has the majority of voting power within a pool. This way, even if a single entity owns most of the staked GRN coin(s), this entity cannot create a hostile situation and attack Grid, as it does not and never will hold a majority of the voting power within a security pool.

PoS2:

GRN Grid's innovative PoS2 consensus includes criteria for selecting a security pool and its voting power. With PoS2, validators with lower stakes earn a higher APY, making Grid the first progressive blockchain and the first to protect the blockchain against high staking entities. It will also actively encourage new validators (decentralization) and prevent wealth accumulation.



7. Speed and scalability

7.1 challenge: speed, scalability & security

Existing blockchains are often classified into three generations.

First-generation blockchains, i.e., Bitcoin, is often a simple shared ledger. In general, this generation only records transaction data.

Second generation blockchains, i.e., Ethereum, expands the functionalities of the first generation. This generation is able to run smart contracts and libraries on top of the simple shared ledger. These two generations often work with an inefficient Proof of Work-based consensus method.

Scalability was a problem for both the first and second-generation blockchains. Their increased power consumption and transaction costs rendered it too expensive for the typical user, even if their stability is lauded.

Third generation blockchains, are constructed on top of the previous

two generations and address several scalability difficulties. For instance, Solana boasts a theoretical speed of 50.000 TPS. By expanding bandwidth and lowering expenses, this generation enhances the utility of blockchain for the common customer.



However, this final generation has been plagued with some controversy regarding their decentralization and stability (Investing.com, 2022⁷). While this generation has fixed much of the scalability issues, it has yet to compete with the immense library and development tools available on the first two generations.

7.2 solution: GRN Grid

GRN Grid is a layer 1 blockchain that is built on top of third generation blockchains. Grid is a safe, scalable, and high-performance blockchain, and it takes a sustainable first approach. The initiative's potential is astounding, as the Grid addresses the two most significant shortcomings of the third generation (stability and decentralization) by proposing a new consensus method (PoS2) and establishing specific hardware requirements.

Proof of Stake2 method improves decentralization and security, while also improving the financial sustainability of the blockchain (READ MORE BELOW). GRN Grid's hardware requirements make the network maintain the target transaction speeds even when the system is overloaded with activity. The GRN nodes run by the community worldwide will help stabilize the Grid even further.

The project partner's GRN Nodes will be powered by renewable mining operations located across the globe. As a result of these nodes, GRN Grid will always have enough validators

equipped with high-speed internet connections and rugged hardware. This increases the network's reliability and eliminates the primary disadvantage of blockchain.

Grid's Lightning Trail Verification (LTV) is the key component of Grid's performance. LTV is based on the approach discussed in the paper of Boneh et al. (2018)⁸ and will utilize the same principles of the VDF.

GRID network can be summarised by these five pillars: Security, Sustainability, Speed, Scalability & Stability.

GRID builds on these pillars by adding customer usability. From the first to the third generation, current blockchains are built with an extremely basic structure. However, GRN Grid will provide companies and consumers with several critical decentralized functionalities. These include the capacity to transmit encrypted notes between parties, the ability to submit invoice requests, and an integrated exchanging system (DEX / P2P). These are open-source features that any developer may enhance or build upon.



8. Proof of Stake v2

8.1 a fair stake

Proof of Stake is hailed for effectively reducing the energy consumption needed to keep the blockchain running. Unfortunately, Proof of Stake introduces two major problems:

First, those with a higher stake get the majority of the rewards. Eventually, lower staking validators are driven away as it becomes less profitable to run a validation node. This means fewer and fewer validators on the network and will cause accumulation of wealth by the top validators (Alex de Vries, 2021⁴).

Secondly, project owners often have the highest stake, especially at the starting phase, in the circulating supply, rendering them the de facto chain owner.

These problems make the PoS consensus method resemble a centralized system. Furthermore, the chances for a 51 attack still remain.

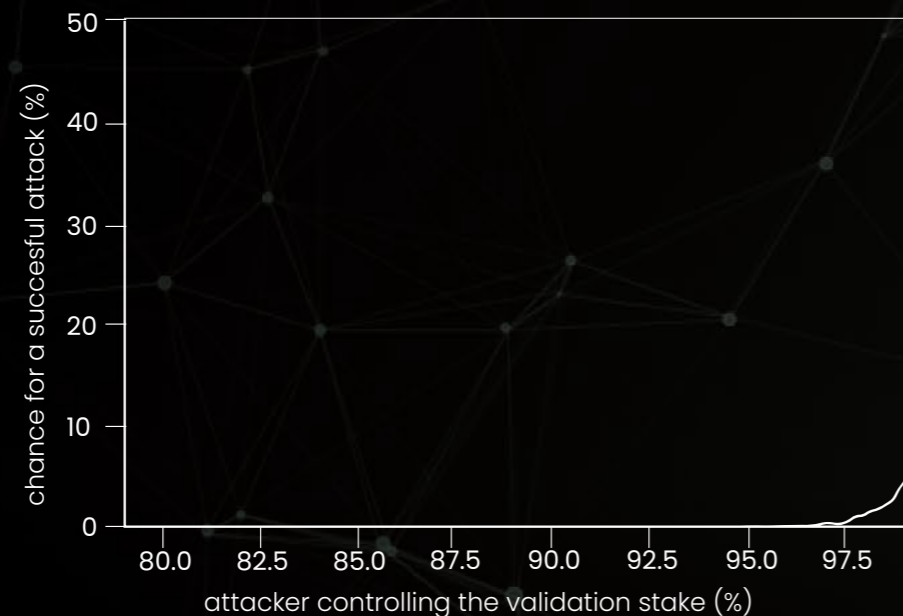


Figure 4: Simulation of an attack on the GRN Grid Blockchain. X axis corresponds to the amount of stake the attacker holds and Y denotes the chance an attacker holds more than 51% of a given Security Pool

To address these issues and protect the network against the 51 attack, the GRN Grid implements a brand-new consensus technique called Proof of Stake V2.

This consensus works in two steps.

To begin, it generates a random selection of validations for a security pool. The selection criterion for a particular security pool is a decreasing concave function on the validator's staked quantity.

Thus, the security pool reduces the likelihood of whales being grouped in a single security pool. This is an additional safeguard to protect the GRN Grid from whale validators attempting to control the system and prevent validator cartels from forming.

More significantly, this strategy promotes the involvement of other validators. In comparison to a linear approach, validators with a lower stake are more likely to be picked to join in a security pool, hence boosting their pay out.

Secondly, a decreasing concave function assigns a voting right for validator j in the security pool i .

The consensus method is evaluated using three different settings:

- 1 attacker holding 80% of the stake (verwijzing)
- 5 attackers holding a combined 90% of the stake (verwijzing)
- 1 attacker holding the minimum required stake but has 51% of the total GRN validators (N@S attack) (verwijzing)

The Proof of Stake V2 showed a 0.0000% chance of a successful attack in all these scenarios. Details of the simulations are listed below.

8.2 the formula

In the equations below P_i stands for Pool $i \in [1, N]$, SV_j stands for staked value of validator $j \in [1, m]$ and w_{ij} for voting right of validator j in pool i .

$$P_i = \sum_{j=0}^m w_{ij}$$

$$w_{ij} < 0.5, \forall i, j$$

$$\sum_{j=1}^m w_{ij} = 1, \forall i$$

$$\sum_{i=1}^n w_{ij} \leq SV_j / \sum_{l=1}^l SV_l, \forall j \quad \text{where:} \quad SV_j / \sum_{l=1}^l SV_l > C$$

$$\sum_{i=1}^n w_{ij} \geq SV_j / \sum_{l=1}^l SV_l, \forall j \quad \text{where:} \quad SV_j / \sum_{l=1}^l SV_l < C$$

To comply with these equations, we decide the w_{ij} by the following method:

$$LVS_j = \log(SV + 1)^2 / \sum_{j=1}^m \log(SV_j + 1)^2$$

$$\text{PoolSize}_i \sim \text{Bernoulli}([10, 15])$$

$$\text{Selection}_{ij} \sim \text{Bernoulli}(SV, n = \text{PoolSize}_i, p = LVS)$$

$$w_{ij} = \log(\text{Selection}_{ij} + 1)^2 / \sum_{j=1}^m \log(\text{Selection}_{ij} + 1)^2$$

8.2.1 Single entity attack (51 attack)

The selection criteria and security pooling guarantee that the GRN Grid is immune to the infamous 51 attack.

Simulation has shown that a bad actor with even 90% of the total stake power has 0.0036% chance of successfully attacking Grid. If the hostile actor controls

90% of the overall stake power, then that probability drops to 0.0000%.

Figure 1 shows the chances for a successful attack versus the amount of validation power an attacker must control.

8.2.2 Whales pooling an attack (51 attack)

A simulation of 5 whale validators holding 90% of the validation power shows that two whale validators' chances in the same security pool are 65.8334%. However, the chances of those whale

validators holding combined more than 51% of a single security pool are 0.0000%. Overall, this means that even if whale validators would merge to attack, it would not be possible to accomplish this.

8.2.3 N@S attack

A simulation of an attack using the lowest possible stake but a high number of validator nodes (51% of the total validators and 6.2154% of the stake) shows that even in this case the system has a 0.0000% chance of falling in the hands of the attacker.

An attacker who controls 75% of the

total validators has less than 1% chance of success (0.57%). However, an attack of this calibre would be practically impossible. The attacker would need an enormous quantity of gear and staked GRN, which is monetarily and logistically unattainable, particularly considering the hardware constraints for GRN nodes.

8.2.4 Verification method

The technical paper will detail the exact implementation of the verifying method per the PoS2. In addition, the technical

paper will also provide a comprehensive explanation of the chain time and other technicalities of Grid.

9. GRN Grid

Grid represents a novel blockchain solution with an emphasis on a sustainable first approach. Grid is widely interoperable with existing libraries in the blockchain industry, while also implementing key features for easier transition from other (de) centralized technologies. Included among these features are an integrated payment and escrow system, exchanging pools, and encrypted communications.

9.2 GRN Decentralized Governance

All functionalities and Grid validator nodes are permissionless, decentralized, and open source, which enables developers to create applications on top of them.

Significant protocol upgrades are distributed using specialized security pools (more participants than normal pools). These specialized pools are assigned with

the responsibility of approving protocol updates. Each special pool member is compensated for voting and is punished for failing to vote by a certain date. In general, the consensus procedure for these special pools is identical to the ordinary consensus mechanism described on [page 22].

9.2 Off\Grid and Power

GRN Grid features an IDE, named Power, which enables developers to quickly develop and deploy on Grid.

Off\Grid, Grid's compressive testnet, is designed to let developers to swiftly validate their Dapps or smart contracts without risking their assets. Additionally, code deployment from OffGrid to the mainnet is streamlined. Anything deployed on the Grid will automatically be deployed on the Off\Grid too.

Grid's block explorer will also display the Off\Grid version of a smart contract. This manner, users may assess the exact same smart contract on Off\Grid before engaging with it and placing actual assets at risk.

Moreover, users will have access to EVM libraries for developing and testing Dapps on the main Grid and Off\Grid.

9.3 GRN Wallet

GRN Wallet is being deployed concurrently with the GRN Grid to immediately improve the usability of the Grid smart chain. The wallet application will be cross-platform and compatible with all major browsers.

Furthermore, the GRN Wallet will be open source, and members of the GRN community will be allowed to develop their own wallets for the GRN Grid.



9.4 Grid features



EnScript

EnScript will allow users to send encrypted messages up to 120 characters attached to a transaction or as standalone messages. These messages can be an invoice number, payment reference code or just a friendly note.



ExNode

ExNode represents the first integrated DEX based exchange on the blockchain. Grid users can stake or swap their tokens to any (stable) currency on Grid, without ever requiring making a transaction to any exchange. This integrated swapping also makes it possible to easily stake any token running on the Grid from the GRN wallet app. ExNode is supported through the GRN Wallet app or any other third-party wallet app connecting to the ExNode contract addresses.



GRNPay

With GRNPay you can send and receive payment requests over Grid, which can be accompanied by EnScript messages. Paying for the requests can be easily done with the wallet app and the recipient will immediately be notified once its payment request is fulfilled. The payment requests can be set in any currency and be paid in a whole different currency, as ExNode will manage the conversion to match the recipient's currency.

GRNPay can also be used as an Escrow service between businesses. GRNPay can reserve the currency on the sender's address until a pre-set condition is satisfied. GRNPay will automatically credit the recipient.

In line with the technicalities of the platform, GRNPay services are hosted decentralized and permissionless on the GRN Grid and are based on automatically issued smart contracts.



10. tokenomics

10.1 GRN (\$G)

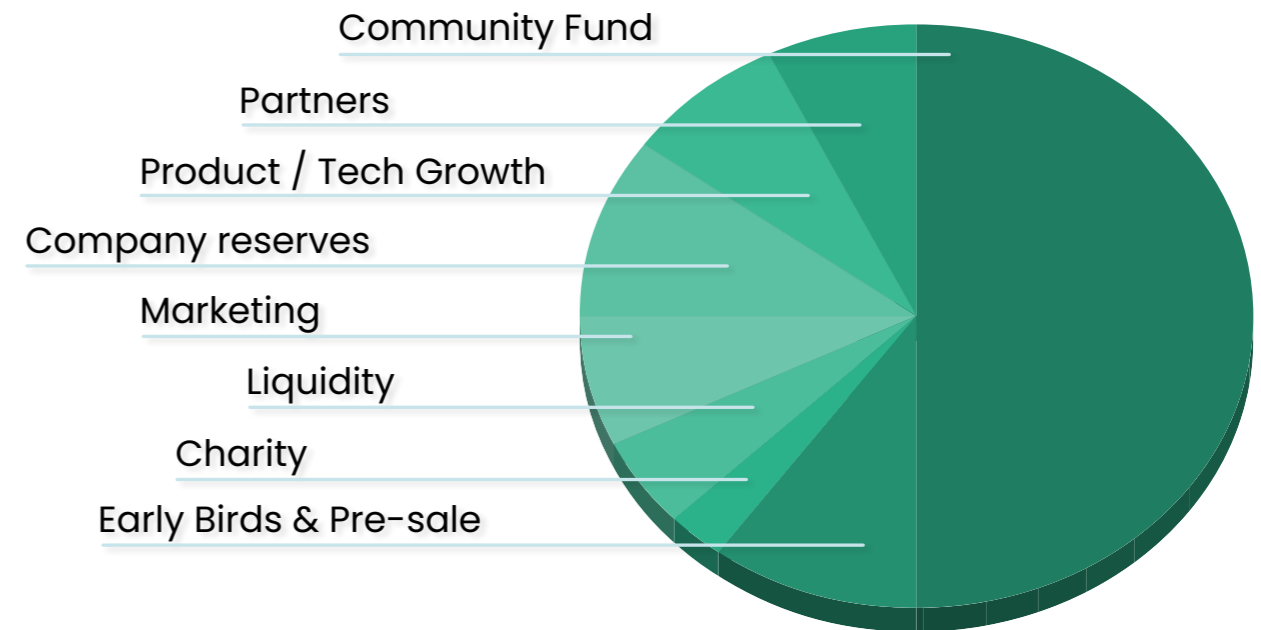
Green will serve as the native token on Grid and will primarily be used for:

Paying for transaction and computing fees

- Validation and staking rewards
- Voting for features
- Shopping on the Grid (NFTs)

Every prospective validator must also stake a specified amount in Grid's security pool to qualify as a validator. GRN is the primary currency used in Grid-based smart contracts and will serve as the primary pool token in EXNode.

In addition, GRN is a utility token that can be used for payment to access corporate services of GRN Energy and some of their partners in the renewable mining sector, after it has become tradeable. This use case provides GRN with a stable and considerable demand, ensuring safety from heavy price fluctuations from day one.



10.2 distribution

Table 1 below shows the token distribution and the associated vesting plan. A total of 1B GRN tokens will ever exist, however, only 130M (13%) will be directly available.

10.2.1 Community fund (rewards)

500M (50%) tokens are locked and will be released as an incentive for validating and staking on the Grid. The vesting uses an asymptotic exponential decline function. This indicates that the proportion of unlocked devices will continue to decline year after year. It will take nearly a hundred years for vesting to reach 1B asymptotically. Following the completion of the first full year of deployment, roughly 15 million (1.5 %) tokens will be issued as an incentive. Within five years, this figure will decline to fewer than 9.5 million (0.95 %).

10.2.2 Charity

Charity funds are reserved for the GRN organization's Giving Back operation and other charity organizations with similar visions. Metabolic and the GRN community serve as a watchdog to ensure that these charity funds are used correctly. Charity funds are fully locked for the next two years, with the purpose of ensuring that the GRN organization has enough time to carefully examine how to implement the allocation of the

funds and how to maintain this procedure decentralized.

The GRN organization is especially interested in instituting a voting system based on the possession of \$G. In addition, we will institute a suggestion and feedback process accordingly.

10.2.3 Liquidity

Liquidity funds will be provided to the market only upon the listing of GRN on a new centralized exchange. New exchange listings generate a surge in demand from new users, resulting in inefficient market pricing and increased volatility. Hence, GRN tokens will be deliberately released at these events to encourage healthy GRN market cap and liquidity development.

10.2.4 Company reserves

Company reserves will mainly be used to establish a delegate program to support independent validators by staking on their behalf. In order to achieve this, application requirements will include that an applicant must prove that they are solely reliant on renewable energy sources.

10.2.5 Marketing

Marketing funds are leveraged as an incentive to attract more ambassadors and to promote the usage of blockchain/ Grid by hosting tech events/hackathons and community conventions.

10.2.6 Product / Tech growth

Product and tech growth funds are reserved to further develop Grid and expand the available decentralized tools on Grid.

Category	Allocation (%)	Unlocked (%)	Vesting
Community fund	500M (50.0%)	0M (0.0%)	Unlocked exponentially
Early Birds and Pre-sale	100M (10.0%)	70M (7.0%)	100% of unsold tokens will be moved to company reserve
Charity	30M (3.0%)	0M (0.0%)	2 year initial lock. After 2 years: 10 % of the lock is unlocked every 6 months
Liquidity	50M (5.0%)	10M (1.0%)	1 year initial lock. After 1 year: 10 % of the lock is unlocked every 6 months
Marketing	70M (7.0%)	5M (0.5%)	1 year initial lock. After 1 year: 10 % of the lock is unlocked every 6 months
Company reserves	100M (10.0%)	20M (2.0%)	1 year initial lock. After 1 year: 10 % of the lock is unlocked every 6 months
Product / Tech growth	80M (8.0%)	5M (0.5%)	10 % of the lock is unlocked every 6 months
Partners	70M (7.0%)	20M (2.0%)	10 % of the lock is unlocked every 6 months
Total	1000M	130M	

Table 1: Tokenomics

*The Delegate program is NOT the GRN Certificate program. The delegate program is hosted by the GRN organization to help new validators with achieving their minimum stake. The delegate program uses the Circuit functionality in the GRN Grid. The GRN organization thoroughly reviews each Delegate application.



11. roadmap

GRN is launched as a token running on the ERC20 network and is available to be freely traded on centralized and decentralized exchanges from Q2 of 2022.

Off\Grid will be offered to developers and insiders in Q4 of 2022. Additionally, this network will serve as a beta test for Grid.

Next, Grid is planned for a launch in Q1 of 2023. The bridge between Grid and ERC20 will facilitate a seamless transaction. Likewise, GRN will continue to be cross chain between ERC20 and Grid.

Grid is being developed in collaboration with the GRN organization and Barrage. Furthermore, Grid's hardware is provided by BITMAIN, a GRN Energy partner.

11.1 ICO

GRN will be introduced to the masses in multiple stages. On January 18th, the Founders hosted an event to share their vision for GRN. Following this event, an Early Birds sale will be held exclusively for our whitelisted community members and venture capital investors.

Early Birds buyers enjoy a discount on their purchases. Since the spots are limited, each investor needs to apply through our website to be eligible for purchase at this stage. Knaken, the partner broker, facilitates this stage, making it possible to buy our token through Visa, MasterCard, GiroPay, iDEAL, Bancontact, EPS and Online Überweisen.

The first stage of the open presale period starts from the 1st of March and will be exclusively through Knaken. The remaining three stages are hosted through different brokers to maximize the reach of GRN and will be communicated at the end of each period.



12. partners



With a strong belief that renewable energy sources can be applied to blockchain technology, GRN Energy is one of the leading players in the area of renewable energy and mining solutions. So far, GRN Energy has had tremendous success and has expanded rapidly, as it currently operates in 11 countries and 28 destinations. In its operations, GRN Energy has the pleasure to partner with some well-known industry leaders such as BITMAIN.

GRN Energy has realized that the present top blockchain solutions do not suit contemporary ecosystem maintenance. Thus, in Q2 2022, GRN Energy establishes the GRN organization and roadmap outlined above to pave the way towards sustainable innovation in this industry.



Barrage will advise and assist with developing and testing Grid and the GRN Wallet. Barrage is highly experienced in on and off chain software solutions. Barrage has worked on projects such as Stealth Protocol and Travelspot. They will provide valuable input in creating the visual identity, branding, user experience, interface design and web app development of Grid and GRN wallet.



13. Founding members



Frederik Vyncke

“Infrastructure and innovation should go hand in hand to ensure that they both interact with the surroundings and the community they are built-in. The digital infrastructure will be the underlying factor to ensure the success of this ecosystem”

Frederik commenced his professional career in procurement and project management for large international OEMs. For the last 7 years he has been involved in building and operating data centres, both enterprise-scale and crypto mining on a senior management level. Throughout his career, he has built a vast global network in the entire blockchain space with exposure to many use cases. Moreover, he holds an executive MBA from AVT Business School, Copenhagen, and an MSc in International Marketing/BSc in Computer Programming. Frederik has both Belgian and Swedish nationality plus lived and worked in seven countries.

Frederik is assisting with the worldwide deployment of GRN nodes because he is a firm believer that blockchain as a technology for humankind must be built on renewable energy.



John de Vroede



“It’s my goal to make the digital world a better and circular environment for the future of our planet and our children “

John’s entrepreneurial background includes founding and managing multiple diverse global companies such as Solve Marketing (strategy, production, and media), Catany World (production of CBDA products) and Solve Tech (crypto and blockchain-related projects). Earlier in his career, he functioned as marketing- and sales director at multinationals like Viacom and France Telecom (Orange/Wanadoo). This diverse experience has taught John that finding the balance between corporate, and entrepreneurship is important to let start-ups professionally grow.

His global marketing and PR network is leveraged to brand the GRN and GRN Grid on the international stage. As an active participant in the crypto community, John feels a sense of responsibility for blockchain’s carbon footprint and thinks that GRN will bring about much-needed change. In essence, John aims to help make this (digital) world a better place for the coming generations, with one block at a time.





Charles Ruffolo

“You were born with a network and it’s based on building trust and earning respect while giving back to your network”

Charles, known under his alias Ruf, is a professional networker who pioneered the development of networking as a new science via his NetworkKing B.V. The Dutch company NetworkKing BV and the associated The Network Club credits its success to its fundamental ideals of trust and respect, along with a commitment to give back to others! Charles is also the Founder of the international Giving Back Foundation.

Charles acquired his MPA/MBA degree in his spare time while serving in the military, honing his innate ability for converging shared interests. He is a distinguished US Army veteran with more than two decades of service. He served as a Battalion Sergeant Major and acquired the ability to communicate in Dutch.

For our initiative, Charles taps into his professional network to attract professionally qualified advisors, ambassadors and entities into the project. Charles believes that there cannot be widespread adoption of blockchain without creating a sustainable alternative to the current industry and believes that GNR Grid is the green alternative the blockchain industry desperately needs.



Harvey Blom

“I believe that digital economy can unleash a tremendous amount of opportunities for people from all over the world to participate and prosper. To help create a more transparent and equal society for generations to come”



Harvey is a former professional athlete and has always been an active serial entrepreneur. This has been visible through the establishment of Cryptly Media, GRN Energy, Duurzaam media, and his own digital coaching enterprise. Through the latter, he has inspired many people across the globe and continues to strive for collective success. As managing partner for GRN Bi, Harvey aims to be a voice for the company but at the same time safeguarding its vision for a sustainable future where everyone will benefit from.



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15. terminology⁹

51% Attack

When more than 50% of the miners/validators in a blockchain launch an attack on the rest of the nodes/users to attempt to steal assets or double spend.

Address

Much like a URL, a blockchain address is the location to or from which transactions occur on the blockchain.

Bitcoin

The first and most popular cryptocurrency based on DLT technology developed from a whitepaper written by Satoshi Nakamoto in 2008.

Block

A group of transactions entered into a blockchain; analogous to a page of a ledger or record book.

Blockchain

A mathematical structure for storing digital transactions or data in an immutable, distributed, decentralised digital ledger consisting of blocks that are linked via cryptographic signature that is nearly impossible to fake, hack or disrupt

Decentralised Blockchain - (Public a.k.a. Permissionless)

A blockchain that resides on a network of computers around the world that is accessible to everyone.

Centralized

A system or process for which there is a singular (i.e., central) source of authority, control and/or truth.

Consensus Mechanism -

Proof of Stake (PoS)

In PoS, miners put up (i.e., "stake") some

of the blockchain's cryptocurrency (e.g., ether for the Ethereum blockchain) in order to increase their chances of being selected to validate a block. The stake is locked up as a deposit to ensure the miner validates the block according to the rules. If the miner violates the rules, the deposit will be "burned" or destroyed. PoS is less resource intensive than PoW since fewer miners are racing to solve the mathematical formula.

Consensus Mechanism - Proof of Work (PoW)

In PoW, transaction data (block) + a random strings of digits (nonce of block) are repeatedly applied to a (hashing) mathematical formula by miners, until a desirable outcome is found (the proof of work). Other miners then verify the proof of work by taking the alleged input string and applying it to the same formula to see if the outcome is indeed that what was presented. If the results are the same, the transaction is verified and added to the blockchain. As many miners are racing to solve the formula which requires a great deal of computing power, PoW is resource intensive.

Consensus Mechanism - (a.k.a. Consensus Protocol)

The process used to validate a transaction across a distributed blockchain network designed to achieve Byzantine Fault Tolerance. Cryptocurrency Digital money which uses encryption and consensus algorithms to regulate the generation of coins/tokens and transfer of funds. Cryptocurrencies are generally decentralised, operating independently of central authorities.



Cryptography

The science of securing communication using individualized codes so only the participating parties can read the messages.

DAO (Decentralised Autonomous Organization)

A governance structure without a central authority which rewards good behavior and penalizes bad behavior by a set of pre-defined rules which can only be changed by a vote, which typically requires a stake, adding risk to the process to discourage bad actors, amongst the participants

Ethereum

A public blockchain that supports smart contracts.

Fiat

Legal tender the value for which is backed by a government or governmental body (e.g., US dollars, Euros).

Fork

A collectively agreed upon software update by all nodes in a distributed network. Sometimes, the previous version continues in parallel with the new version.

Fungible

The property of an item being exchangeable with other like items. For example, USD and Euros are fungible. The value of USD can be expressed in Euros.

Gas

A fee charged to write a transaction to a public blockchain. The gas is used to reward the miner which validates the transaction.

Governance

Establishment of policies and continuous monitoring of their proper implementation of an organization or system.

Hash Function

A function that receives an input of any size and returns a unique string of a uniform length.

Identity

The information on an entity used by computer systems to uniquely represent a person, organization, application, or device.

Immutable/Immutability

The property of being unchangeable. Once a transaction has been added to a block and written to a blockchain, it cannot be changed and therefore is immutable.

Initial Coin Offering (ICO)

The first sale of a blockchain coin or token.

Interoperability

The ability of two or more systems to communicate and exchange data. Due to various design decisions (e.g., consensus protocol) most blockchains are not interoperable, however there are many projects that are working to connect various blockchains.

Know Your Customer (KYC)

The legal process of a business identifying and verifying the identity of its clients. KYC requirements vary from jurisdiction to jurisdiction.

Liquidity

The ease of converting an asset (or, in this case, cryptocurrency) to cash (fiat).

Mainnet

The production version of a blockchain

Mining

In a public blockchain, the process of verifying a transaction and writing it to the blockchain for which the successful miner is rewarded in the cryptocurrency of the blockchain.

N@S Attack

When an attacker does not experience a negative impact from a successful attack on a blockchain.

Node

A computer which holds a copy of the blockchain ledger.

Non-Fungible

The property an item of not being exchangeable with other like items. For example, USD and Euros are fungible. For example, a Stratovarius violin is non-fungible because the value of it cannot be expressed in a number of other violins.

Off-chain

Data stored external to the blockchain. On-chain Data stored within the blockchain.

Open Source

Software products that include permission to use, enhance, reuse or modify the source code, design documents, or content of the product.

Peer-to-Peer (P2P)

A direct connection between two participants in a system - can be computer to computer or person to person.

Public/Private

Key A public key is a unique string of characters derived from a private key which is used to encrypt a message or data. The private key is used to decrypt the message or data.

Satoshi Nakamoto

The name used by the person or entity

who developed bitcoin, authored the bitcoin white paper, and created and deployed bitcoin's original reference implementation. As part of the implementation, Nakamoto also devised the first blockchain database.

Sidechain

A discrete blockchain that is linked to a main blockchain via two-way pegs which enable assets to be interchanged between the main blockchain and the sidechain. Sidechains are a method to enable scaling and increase transaction speed by only performing necessary transactions on the main blockchain.

Smart Contract

Self-executing computer code deployed on a blockchain to perform a function, often, but not always, the exchange of value between a buyer and a seller.

Solidity

A JavaScript-like object-oriented programming language for Ethereum for implementing smart contracts on the Ethereum blockchain.

Stablecoin

A cryptocurrency which is underwritten by an asset or assets (e.g., fiat currency, commodities, etc.) designed to minimize the volatility of the price of the coin/token.

Testnet

A staging blockchain environment for testing application before being put into production (or onto the mainnet)

Token

Cryptographic tokens represent programmable assets or access rights, managed by a smart contract and an underlying distributed ledger. They are accessible only by the person who has the private key for that address and



can only be signed using this private key.

Token/Coin Exchange

An application to buy, sell and trade cryptocurrencies.

Tokenomics

The study, design and implementation of monetary management and distribution based on blockchain technology.

Transactions Per Second (TPS)

A measurement of the speed of a blockchain. The low TPS of most blockchains is a significant barrier to using blockchain for business, especially financial, applications.

Transparency

A primary property of public blockchains whereby any participant in a system or transaction can view the transactions on the blockchain.

Trustless

The elimination of trust from a transaction. Blockchain is called a trustless system because the two entities performing a transaction do not need to trust one another. The properties of blockchain – digital signatures, cryptography, etc. – provide the trust.

Wallet

A digital file that holds coins and tokens held by the owner. The wallet also has a blockchain address to which transactions can be sent.



You made it to the end!

Thank you for reading the Greenpaper.

If you have any questions,
don't hesitate to contact us at:

ask@grngrid.com



