



# Phaeton

Artemis Node





## A Phaeton Staking Node connected with IoT and AI White Paper

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## INTRODUCTION

Since the introduction of Blockchain Technology, there have been many innovative ideas created by intelligent Tech Geeks. One of these is called “Staking”, which is a form of generating a passive income. This passive income is generated by being a validator of a specific cryptocurrency. It is a mechanism where an approved validator is rewarded for holding cryptocurrency or tokens to support a network operation and receiving a reward for it. In simple terms:

Staking is the process of actively participating in transaction validation (similar to mining) on a proof-of-stake (PoS) blockchain. On these blockchains, anyone with a minimum-required balance of a specific cryptocurrency can validate transactions and earn Staking rewards.

The concept of “staking” may sound new, but it is not. Bank accounts offer a form of staking as well, though this is referred to as “interest.” Most fiat savings account, for instance, provide less than 1% interest on money deposited, well below the inflation rate. Whereas cryptocurrency staking often offers much higher rewards with rates as much as 5% and much more.

Staking is a creative and innovative investment tool. It can compete with traditional ones in terms of stability. With the growth potential of the assets, it is superior to them. Proof of Stake (PoS) and staking creates more opportunities for anyone likely to participate in the consensus and governance of blockchains. In this White Paper, we provide a complete analysis of how Phaeton has developed its model, how it works together with its significant benefits.

Phaeton has developed its own Staking Node linked with IoT and AI deployed into both housing and small businesses. Millions of homes are constructed around the globe each year, and Phaeton's goal is to deploy its Staking Node into these new homes. In addition, the passive income generated to our Staking Node will assist the homeowner in paying off their loan much sooner. As for businesses who deploy our Staking Node, it will help in paying their rent and improve their cash flow.

Phaeton's philosophy is to educate the public about the benefits of Blockchain. We do this by applying Blockchain technology to people tangibly and realistically. For example, where would one find an opportunity that by purely owning a physical gadget such a Phaeton Artemis Node, an owner of such a gadget will generate passive income? It may sound like science fiction or magic, but in reality, it is precisely what Phaeton has created by blockchain technology intelligently providing a financial benefit to the owner of Phaeton's Artemis Node



## THE IMPORTANCE OF NODES

A Node is an essential component of Blockchain's infrastructure. These nodes act as further validation for a Blockchain ledger - in this case on Phaeton's Blockchain Ledger - allowing anyone to view transparent transactions or data conducted on the network, albeit such transactions are anonymous. In addition, these nodes ensure that data held on the Blockchain is valid, secure and accessible to authorised parties. Blockchain networks rely on an overall consensus model, which is critical to the validity and security of the data held on the network. The consensus is a mandate of standards to which each block on the network must adhere.

## What is a Blockchain node?

Any device connected to the Blockchain can be classed as a node. It can include servers, computers, laptops, online or desktop wallets and mobile phones. All these nodes are connected to the Blockchain and are constantly updated with the latest transactional information added to the Blockchain.

## What Does a Blockchain Node Do?

The objective of nodes is to maintain reliable data stored on a blockchain and validate a new block whilst incrementally augmenting redundancy. There can be numerous roles based on specific tasks, but the essential functions of a node come down to:

- Accepting or rejecting transactions;
- Managing the transactions and their validity;
- Storing the cryptographically linked blocks;
- Acting as a point of communication.

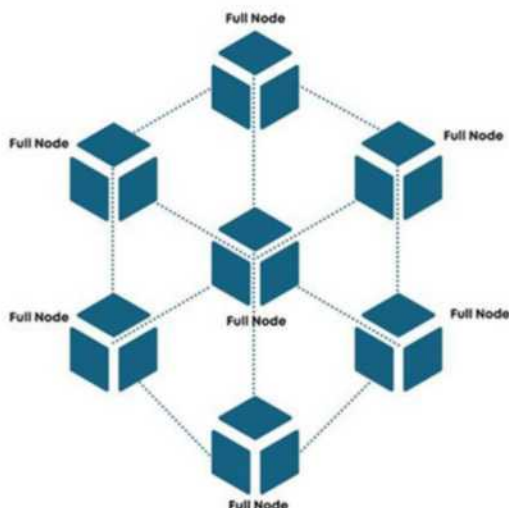
## What are the different types of Nodes?

Nodes can be classified into two main categories:

- **Full nodes:** a single copy of the entire blockchain history, including transactions, timestamps, and all created blocks.
- **Light nodes** or SPV nodes are typically downloaded wallets and are connected to full nodes to validate further information stored on the Blockchain.

### Full Nodes

A full node stores all information held on a blockchain and acts as a core server across decentralised blockchain networks. Each block in a blockchain is verified, authenticated, and stored by all the full nodes in a network.



A full node is part of a Blockchain's governing model. While there are different governance models, usually when a Blockchain undergoes any improvements, most full nodes have to agree. Therefore, full nodes have voting power in the Blockchain. Full nodes are further categorised as (a) Pruned Full Nodes - these nodes have a defined memory limit to hold data and (b) Archival Full Nodes - these are the more common full nodes used in Blockchain. They maintain the whole Blockchain in their database. The significant difference between an archival and a pruned full node is the additional memory available.

Archival nodes can be further divided into the following categories

- **Authority Nodes**

With a public Blockchain, anyone can join the network and become a node. However, access to data needs to be maintained and governed by certain authorised entities.

- **Mining Nodes**

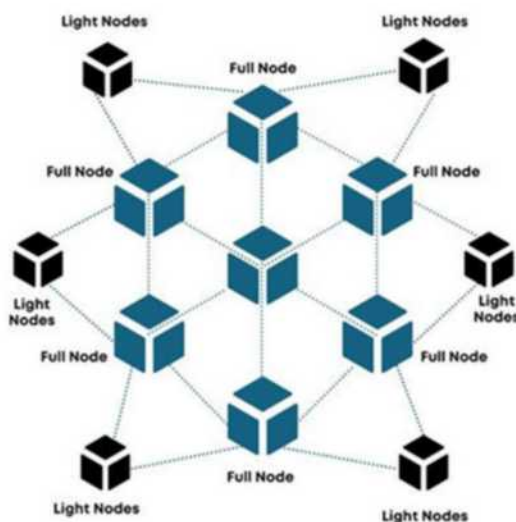
By way of example, well-known to the world of cryptocurrency is the term “bitcoin miners” and essentially these “bitcoin miners” are classified as nodes, for the purpose of mining Bitcoin. For consensus algorithms such as the Proof of Work (PoW), nodes must solve complex mathematical functions to validate a transaction. These validation tasks require significant computing power, which requires substantial energy.

- **Staking Nodes**

Like mining nodes, other nodes are responsible for validating transactions to maintain the consensus algorithm, such as Proof-of-Stake (PoS). These nodes are required to stake their cryptocurrency, validate the transaction and then get rewarded for the process, hence the creation of passive income. In staking, a specific node is selected according to pre-defined rules. This node is then allowed to validate a transaction and earn rewards. These nodes do not require high computing power; therefore, less energy is used.

## Light Nodes

A light node stores and provides only necessary data to house daily activities or faster transactions. They are not involved in invalidating any blocks, but they store the block headers. Thus, instead of holding a complete history of a blockchain, they only have a block header.



A block header is a detailed summary of a specific block and includes information relating to a particular previous connected block. Information stored in the block header consists of the timestamp of the block and a unique identifying number (also known as a nonce). These are also called Simplified Payment Verification nodes (SPV nodes).

Some other Blockchain light node types need to be mentioned, include:

- **Super Nodes**

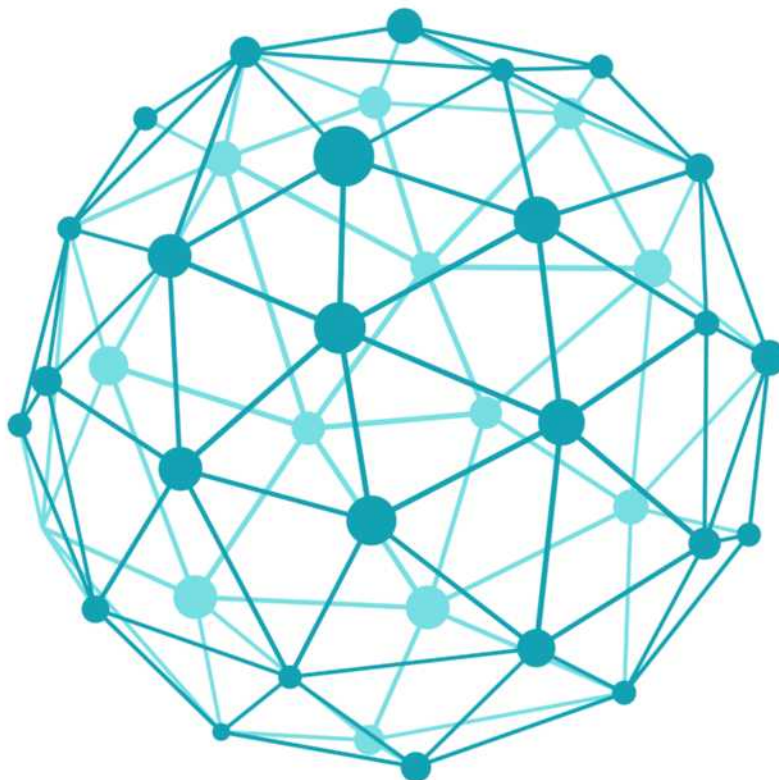
Super nodes are created to carry out some particular tasks. For example, implementing a Blockchain protocol change or maintaining the Blockchain rules is done by a super node.

- **Lightning Nodes**

Congestion in a Blockchain network is a common problem that leads to delayed transactions.

Therefore, lightning nodes create a separate network with a user, and the transactions are pushed to the main Blockchain. It allows the transactions to be immediate, which both increases the speed of transactions whilst simultaneously reducing the cost of transactions.

We have explored roles played by different types of nodes as part of the core infrastructure of a blockchain. Phaeton's goal is to be the most decentralised Blockchain globally. By implementing the strategy of deploying Phaeton Artemis Nodes in many homes, small businesses, and offices, we will have the most secure and fastest Blockchain in the world. Therefore, it will make Phaeton the most secure blockchain network in the world and prevent a 51% attack, which is critical in terms of cybersecurity





A hand is holding a tablet computer. The tablet screen is black and displays a large white key icon in the center. Surrounding the key are several circular icons: a tooth, an envelope, a pencil, a stethoscope, an '@' symbol, and the letters 'IOT'. The background of the entire page is a light brown color with a network diagram of dashed lines connecting various circular icons, including a tooth, an envelope, a pencil, a stethoscope, an '@' symbol, 'IOT', a microscope, and a washing machine.

## PHAETON ARTEMIS NODE

Phaeton Artemis Nodes are full Nodes with a Staking model responsible for validating transactions to maintain the consensus algorithm, such as Proof-of-Stake (PoS) described in detail later. These nodes are Phaeton Delegates who stake their PHAE Coins, validate the transaction, and get rewarded with additional PHAE. However, Phaeton Artemis Nodes are not limited to staking, A Phaeton Artemis Node also collects data and integrates with IoT (Internet of Things) and AI (Artificial Intelligence).

## IoT Technology



The Internet of things (IoT) is a network of physical objects embedded with sensors, software, and other technologies used to connect and exchange data with other devices over the Internet. IoT applications are transforming our daily lives by providing efficient solutions for both the public and private sectors. An IoT system has four major parts contributing to its functionality, namely:

Sensors such as cameras, GPS, or accelerometers to sense things.

- A source of connection such as Bluetooth, Wi-Fi, LTE, etc.
- A data processing unit to process and analyse data.
- A user interface in which a user can interact with the IoT device.

Below are just a few IoT applications:

- **Smart Homes:**

Smart Homes are probably the first thing that we think of when it comes to IoT. The estimated amount of funding for Smart Home start-ups exceeds \$2.5bn and is ever-growing.

- **Medical:**

IoT applications are helping the healthcare industry by allowing them to monitor their patients at home or in remote areas, therefore decreasing the costs by minimising the need of visiting a doctor.

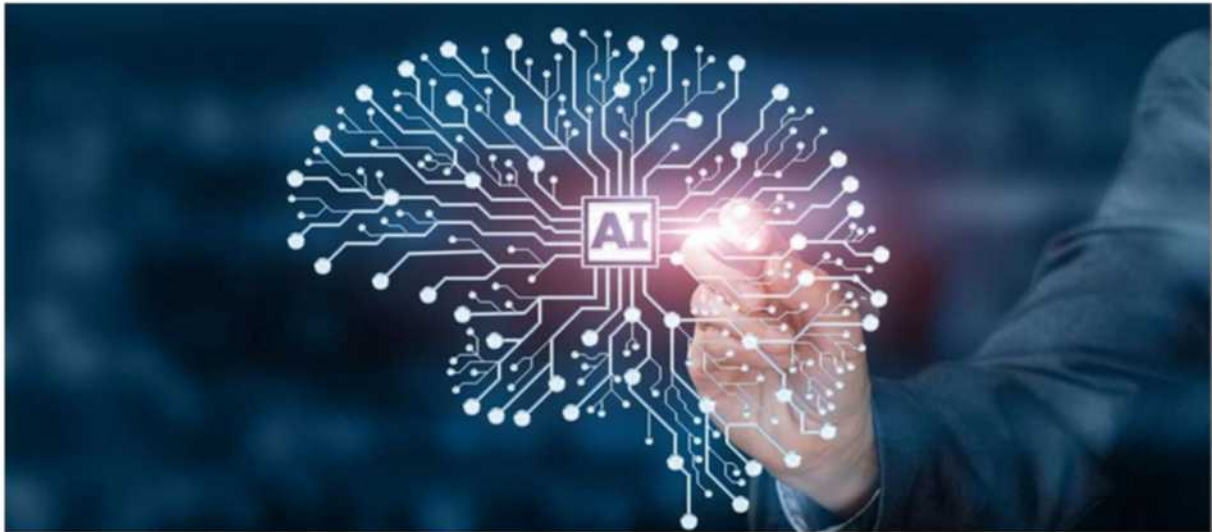
- **Industrial Automation:**

Automation refers to the use of advanced computers, robots, or smart devices for performing various operations in an industry, and it is taking place at a significant pace.

- **Smart Farming:**

IoT is revolutionising the agricultural industry. Farmers use it to optimise their farming operations. It can include determining the ideal time to harvest the crops, analysing the soil contents for better production, tracing the moisture contents in the soil, etc.

## Artificial Intelligence (AI)



Artificial intelligence can be referred to as the simulation of human intellect in machines programmed to think like humans and mimic their actions. With the progress of study into the analysis of the human mind and the in-depth subsequent research into this field, AI is no longer a few machines doing basic calculations. Instead, artificial intelligence applications are wired using a cross-disciplinary approach based on mathematics, computer science, linguistics, psychology, and many more realms.

Artificial intelligence and its applications are endless. AI applications can be applied in many different sectors and industries to generate the maximum output out of the operational front. Currently, AI is being tested and used in many other industries. These include self-driving cars, automated systems, computers that can play games like chess, and much more. In addition, team Phaeton is looking at behavioural science and personal identification that can be linked to a Phaeton Artemis Node.



## THE EVOLUTION STAKING

To better understand staking, below is an outline of its evolution, starting with the history of Proof of Work.

## History of Proof of Work (PoW)



Mining new crypto coins utilise significant computing power because of the PoW algorithm. The idea was introduced in 1993 to combat spam emails and was formally called PoW in 1997. The technique went largely unused until Satoshi Nakamoto created Bitcoin in 2009. He realised that this mechanism could be used to reach a consensus between many nodes on a network, and he used it to secure the Bitcoin blockchain. However, the PoW algorithm works by having all nodes solving a cryptographic puzzle. Miners

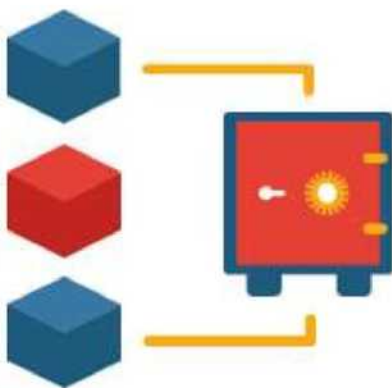
solve this puzzle, and the first one to find the solution gets the miner reward. It has led to a situation where people are building larger and larger mining farms, causing a significant problem where significant power is used.

## Problem with PoW

According to this economist, Betori Manners, PoW uses about 54 terawatt-hours of electricity, enough to power 5 million households in Australia or the entire country of New Zealand. But it does not stop there. PoW gives more rewards to people with better and/or more equipment. The higher the hashtag rate, the higher the chance that a miner will create the next block and thus receive the mining reward. Miners can come together in what is called mining pools. Jointly they combine their hashing power and distribute the rewards evenly across everyone in the pool. So, to sum it up, PoW is causing miners to use massive amounts of electricity, and as it encourages the use of mining pools, it makes the Blockchain more centralised as opposed to decentralised, which essentially defeats the magic of Blockchain technology.



## The Proof of Stake (PoS) Solution



To resolve the power needed for a POW transaction, a new consensus algorithm was created called Proof of Stake (PoS). In 2011, in a Bitcointalk forum, a user called Quantum Mechanic proposed a new technique that he called PoS. Instead of competing against each other with mining, the PoS uses an election process in which one node is chosen to validate the next block. PoS has no miners but validators. Validators are not determined entirely randomly. The validator has to deposit a certain number of coins into the network to stake, similar to a security deposit. The volume of coins improves the chances of a validator being chosen to forge the next block.

The difference is significant.



The difference between PoW and PoS is quite significant. PoS does not let everyone mine for new blocks and therefore uses considerably less energy. It's also more decentralised compared to PoW. In PoW, there are mining pools. These pools control large portions of the Bitcoin blockchain. They centralise the mining process, which could be very dangerous. For example, if the three biggest mining pools merged, they would have a majority in the network and start approving fraudulent transactions. It is called to 51% attack, and it was first discussed as a weak point of the PoW algorithm. Another significant advantage is that setting up a Node for PoS is a lot less expensive compared to a PoW model. One does not need costly mining equipment, and thus, PoS together with the Staking model discussed above encourages more people to set up a node, making the network more decentralised and considerably more secure.

PoS is not perfect



The PoS is not perfect and still has some flaws. Although a 51% attack is less likely with PoS, validators must be careful as to how they select the next validator. A validator should not be recommended based on the size of their stake, as it will only favour the rich, who will end up being frequently selected. It will result in the chosen validator collecting more transaction fees becoming richer, and it decreases the chances of other validators being chosen. Another potential problem is when the network selects the next validator, and they do not turn up to do their job. However, it could easily be solved by choosing a large number of backup validators. In short, PoS brings additional risks, and further research is needed to understand these risks and then mitigate them.

## Delegated Proof of Stake (DPoS)



An updated and modified version of PoS was introduced by crypto entrepreneur Daniel Larimer. It was called Delegated Proof of Stake (DPoS). It is a variation of the PoS algorithm that introduces a voting element. The community votes on who should be the approved validator. It is a democratic system on the Blockchain. In DPoS, the community selects several witnesses or block producers to secure the cryptocurrency network. These witnesses sign each block in the Blockchain. Then the users of the network must first approve the witnesses via a voting system as long as several safeguards are placed, which includes the following:

- A witness cannot sign blocks randomly. They would need to verify that a trusted witness signed the previous block.
- If a witness does not produce a block, they are at risk of being fired and losing guaranteed profits in the future.

Below is a table outlining the difference between PoW, PoS and DPoS.

	PoW	PoS	DPoS
Less incentive to centralise	✗	✗	✓
Higher transaction volume	✗	✗	✓
Faster confirmation times	✗	✗	✓
Energy efficient	✗	✓	✓
Incentivises development	✗	✓	✓

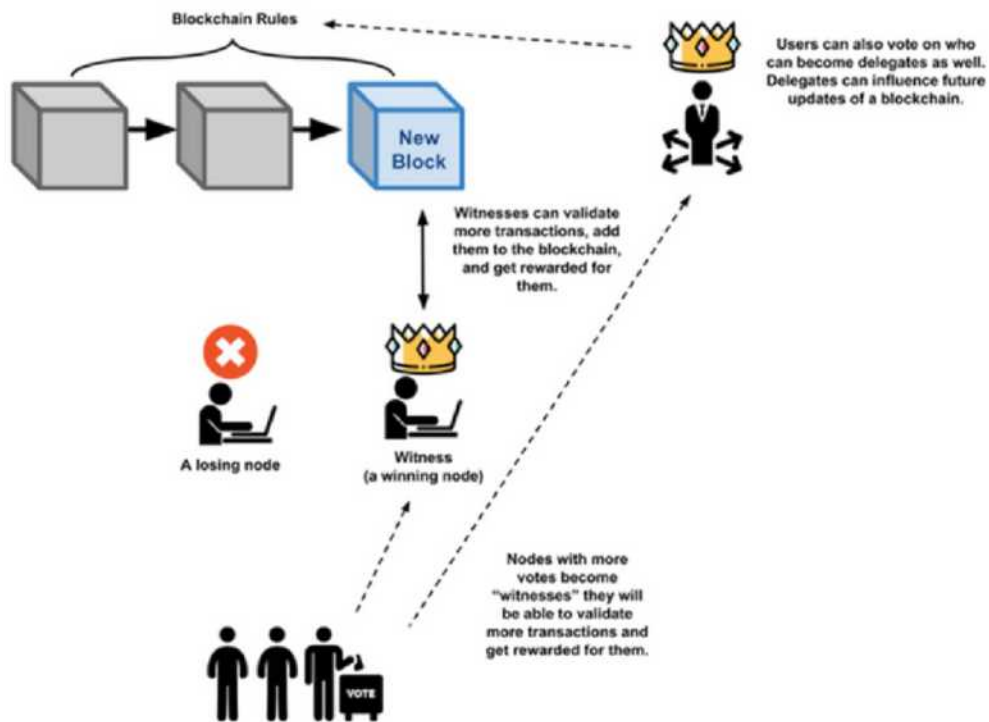
## PHAETON'S DELEGATED PROOF OF STAKE (DPoS)

Phaeton implements its own unique Delegated Proof of Stake (DPoS) consensus and BLAKE3 Military Grade algorithm, which is faster and more secure than its competitors. With this algorithm, the platform's stakeholders have to outsource their work to other nodes or validators. These validators are then responsible for validating the Blockchain network transactions, and in return, they get rewarded.



Compared to other Blockchain platforms that facilitate staking, Phaeton offers a sustainable alternative for staking and generating a passive income. The use of DPoS makes Phaeton an energy efficient Blockchain as well as an infinitely scalable platform. Furthermore, the Phaeton Blockchain is structured to support a sidechain architecture. Sidechains can be used to create separate small Blockchains that is connected to the main Blockchain. Therefore, the transactions or activity on the Blockchain can be segregated among these sidechains, allowing the network to be free from congestion.

### How do the rewards work?



The rewards are shared among the delegates and validators. It allows the Blockchain network to be more scalable and complete significantly more transactions per second for example, Phaeton's current tps = 1Mtps. Moreover, the validators are chosen through a voting system, enabling the network to be truly democratic and decentralised. Here, the node selected to become a validator must be an owner of Phaeton's native token, PHAE. All validators put their PHAE at stake and then delegates the validation activity to a selected node that holds PHAE. After the validation process a block is created, then both the selected Delegate and other validators (Voter) are able to share the rewards with the delegate. The delegate has full rights on the distribution of the rewards via a smart contract arrangement to voters.

## **Governance of PHAE coin**

All staking interactions on the Phaeton Blockchain ecosystems are done through PHAE, the native coin governed by the validators part of the DPoS community. This Governance model empowers holders of PHAE coins in real terms regarding the governance of the platform.

## **Market capitalisation**

The market capitalisation of PHAE coins is directly proportional to supply and demand, which importantly makes PHAE coins completely free of any external influence thereby facilitating the retention of the value of PHAE coins.

## **Factors influencing staking rewards:**

The market capitalisation of PHAE coins is directly proportional to supply and demand, which importantly makes PHAE coins completely free of any external influence thereby facilitating the retention of the value of PHAE coins.

## **Factors influencing staking rewards.**

The rewards that the validators gain is dependent on several factors. These include:

- The number of coins a validator is staking will equate to the weight of the vote.
- Time length the Delegate(s) has/have been actively staking.
- Total number of coins staked on the network.
- Arrangement between the selected Delegate and other Validators.
- The Rate of inflation.

## **Unique**

Phaeton is unique among other platforms. Staking on Phaeton is a secured and efficient means of generating a passive income. The technology behind Phaeton Blockchain is advancing rapidly. Once milestones such as 1 million transactions per second are reached, and the brand gains popularity, it is expected that there will be a rapid stream of investors keeping the PHAE price bullish. The ecosystem has been designed to slowly release PHAE into the market with mechanisms to keep inflation in check, increasing the demand and price of PHAE. Like any project, the early stage is the perfect time to stake and maximise returns. There are many cases where early validators garnered returns 500-600% or more, and there is the possibility that the early-stage validators to Phaeton Blockchain will earn significant rewards.

# HOW STAKING REWARDS ARE CALCULATED

Staking rewards are calculated based on several parameters. Staking provides high returns by simply staking and holding your PHAE coins. Staking rewards can also be calculated through a staking calculator. The calculator shows the amount of PHAE a validator is likely to receive in the staking process. The higher the value of a PHAE coin, the higher the reward. Typically, the calculation is usually based on the average percentage interest likely to be accrued over some time. However, the amount of reward will vary and depends on several factors, such as how many PHAE Coins a validator owns and how many validators are within the transaction. The bottom line is that the longer the validator's holding of PHAE coins is affected, the higher the amount a validator is likely to be rewarded.



## Hypothetical sample

By way of example, the following calculation will provide an understanding of staking rewards.

### Assumption

The exercise assumes that all nodes have an equal number of coins staking on the Phaeton Blockchain protocol. Thus, a delegate with more PHAE coins staking and more voters voting have a higher chance of winning each delegate round.

### Furthermore:

- The more PHAE coins you hold, the more weight you carry, which equals having a better chance to be part of each delegate round.
- The more votes a Delegate receives from the community, the better the odds of being part of each round.
- The Delegate code values have been set to 86 Delegates for each round plus two validators as a backup.
- The reward is set at 4 PHAE per validator round every 5 seconds with a 250 KB block size. The consensus around this is to maintain the longevity of the block height and block size over time.

### Calculations

- 4 PHAE every 5 seconds.
- 12 winner's every minute, then times this by 60 minutes, times this again by 24 hours, time this again by seven days and times this again by 52 weeks in a year.
- Totals 28,304,640 PHAE rewards for the first two years.
- If we have a total number of 10,000 validator nodes, the estimated return on investment is 2,830.464 PHAE per node.

Validators also have the opportunity to reward voters that supported the delegate to be voted in. This is a community approach to create a democratic system. A validator can set their reward distribution percentage of coins rewarded to the community verified on the Blockchain.

With a democratic system, selected validators who give back more rewards to the community (voters) can better get re-elected to another delegate round. In addition, staking rewards have a scaling model halved every two years and fixed at 1 PHAE after six years. It means the rewards will be improved over time. Phaeton has set up this model to combat inflation and reduce additional coins begin created over time.

There are only two ways to set up as a delegate.

1. With Phaeton's Helios Deployer, Delegates will host a full blockchain node and manage their nodes in partnership with Phaeton Network.
2. Delegates will be able to purchase one of our private and custom-built nodes for their home or business.

## CONCLUSION

Unlike other complex investment ventures in the crypto industry, staking gives Phaeton Node holders a seamless investment option to earn PHAE without actively being involved in the process. In this case, Delegates receive rewards whether they are active on the network or not.

Phaeton's strategy in deploying and marketing Phaeton Nodes in real-life situations and many locations will make Phaeton a world first: a truly decentralised blockchain. Furthermore, deploying Phaeton Artemis Nodes in both new and old locations will make housing more affordable as homeowners will have additional income to pay off their home loans.

As a positive beneficial social impact enterprise, Phaeton will be making Phaeton Artemis Nodes available to businesses as well. The recent COVID 19 lockdowns will help struggling businesses with a passive income in times of need. The passive income will also improve a business's cash flow.



**Phaeton**  
Artemis Node

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