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PL^G and PL^GNet Whitepaper 2.0

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Version 2.5.2

IMPORTANT INFORMATION

General

This White Paper provides a general technical overview of the proposed decentralised network infrastructure, and the associated decentralised token economy described in the PL^G Tokens section of this White Paper and, more generally, the PLUG Platform. This White Paper is for information purposes only.

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(ii) distributed and will not distribute, directly or indirectly prior to the Release Date, the White Paper, Plug New Zealand Limited's constitution, or any other offering materials or advertisements in relation to the PL^G Tokens,

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PL^Gnet
Multi-Chain Synthetic Assets Network

A network to enable asset custodians to leverage any asset from any network in its synthetic form in DeFi

Abstract

PL^Gnet was first conceived in 2018 to enable application-specific networks to be built and connected. Achieved, this vision would allow interoperability between different assets from different networks.

The original PL^Gnet V1 whitepaper describes the challenges to broader adoption of decentralised technology. Our thesis to solving those challenges included a strong focus on user experience and interoperability.

PL^Gnet was focused on the long term. It remained realistic about the outcomes blockchain could enable, once it passed its initial “cyberpunk” adolescence and moved into the mainstream.

“Our thesis is that hype aside, the central value proposition blockchain will provide in practice is the movement of certain types of organizational trust and management of identity from a manual operationally-driven process to an automated, protocol-driven process”

Ref: Plug White Paper V1

This vision focused on harnessing the key attributes of blockchain technology in a practical way: to improve the user experience and introduce new efficiencies. It was an honest look beyond the hype and rhetoric to the features that could make a difference to everyday users.

The first practical lesson of blockchain is that blockchain does not fundamentally remove intermediaries; blockchains themselves are intermediaries. They are intermediaries that may

be owned by distributed groups of individuals, but they are the medium through which one transacts, they carry fees, and you're reliant on their abilities to process your transactions.

Ref: Plug White Paper V1

The blockchain space is full of ideals which make it a very special movement - a place where new ideas can flourish.

Unfortunately, this optimism means we tend to be persuaded by our own hype. Tribalized communities now argue the finer points of inconsequential differences in approaches made by competing projects. Too often, mantras of "decentralisation" are more ideology than reality. Many large pillars of the "DeFi" space are fragile decentralisation at best.

You don't have to look far to find examples of major infrastructure that underpins the economics still under the control of multi-signature wallets, or individuals and corporations who can be regulated.

Dive deeper into DAOs and you see an emerging trend for councils of elected people ('trusted' third parties), being formed to enable governance to work practically and counter the low participation of asset holders in governance processes. It's fair to say most end users don't care (or don't have the time, technical aptitude, or subject-matter expertise to warrant continuous, meaningful engagement) which is unlikely to change. In fact, the participation issue will get worse as the space grows and its share of crypto natives decreases.

We have already seen an indication of end user behaviour and attitudes with the recent uptick in usage of networks like BSC.

While these trends may appear discouraging on the surface, they are positive developments when considered more broadly. They acknowledge the weakness of our initial utopian ideals, but also demonstrate the upside if we improve user experience and the practical capacity of the technology to deliver fair and transparent decision making, even if there is a human element.

When we look at decentralisation more wholistically the notion of fragmentation of the idea space is an awesome and powerful driving force in innovation. It increases the chance of success in the same way evolution tries many different paths to forge a stronger species. The downside of fragmentation is a poor user experience, with many

users having to rely on trusted third parties to maintain a wide range of assets from different networks.

In practice, these user experience issues are unlikely to subside - at least in the near term. Fundamental problems with private key management loss and recovery will drive the average participant towards third parties, to make their user experience simple, act as a bridge between the different networks, and lower their risk (real or perceived). Of course, there are proposed mechanisms to advance the solving of these concerns. The Doughnuts protocol developed by PL^G is designed with this problem in mind and Vitalik Buterin has discussed social recovery mechanisms. Both of which have promise but require user behaviour changes.

This doesn't diminish the role blockchains play in advancing global financial services and broadening economic participation. On the contrary, blockchains still have a critical problem to solve, enabling transparency, interoperability and composability. These are crucial factors that will drive better products, more transparent markets and broader participation.

As our friends at BarnBridge have noted, there are huge inefficiencies that can be solved for. By harnessing the transparency, interoperability and composability of distributed ledger technology, we can transform structured products that have yielded negative outcomes in their past/present form, like CDOs, into positive instruments that accurately serve their intended purpose:

"These efficiencies will inevitably attract higher value, longer duration loans to decentralized ledgers. The efficiencies are enabled by smart contracts unique ability to algorithmically hold digital collateral until both sides of the transaction fulfil their obligations and automate the process of settlement.

Custody, settlement, and escrow are labour-intensive, costly actions within the legacy system. Their reduction to algorithmic actions is reducing the rent charged to perform these actions.

Efficiencies of automation, coupled with the perception of higher risk, are why the yields are higher on decentralized systems. As risk in DeFi converges on risk levels perceived in TradFi, by the nature of the loans moving from crypto-backed loans to traders to collateralized mortgage loans to homeowners, for instance, the efficiency of smart contracts will continue to offer higher yield on decentralized systems than traditional centralized systems.

The efficiency of smart contracts and DAO technologies allows for far more complex derivative instruments to be built & provides a level of transparency and security unfathomable in current financial networks."

Ref: https://github.com/BarnBridge/BarnBridge-Whitepaper

If we look candidly, the blockchain community must acknowledge that the current global financial infrastructure is in many ways already fairly decentralised. It has many intermediaries, providers, jurisdictions, technologies assets, markets and brands. However, the traditional financial infrastructure lacks blockchain's key ingredient: transparency, interoperability and composability.

From this clear view of the world, PL^Gnet V2 has evolved. We continue to harness the same inspiration to remove barriers to integrate networks (and the liquidity within them) and improve the user experience. And we continue to be realistic about decentralisation, by looking to offer practical steps to change the nature of intermediaries and move decentralisation forward.

Current Problems Worth Solving

1.

Decentralisation & Usability

The current landscape for users is highly fragmented with many different networks, technical approaches and communities. If we truly believe in decentralisation as a concept, we must accept this impassioned expression of competition as a positive signal. Tribalism often finds a way to rationalise a zero-sum winner game where one chain rules them all. This is neither practical nor desirable in a world view that embraces decentralisation.

However, this does present a problem for users: How do I manage all my different assets in all these different places?

This problem has driven an industry of trusted third parties, exchanges, aggregators, wallet providers, custody solutions and multi-chain protocols. However, this too is often fragmented making it difficult for users to manage.

Question:

How do we solve for security without sacrificing the benefits of blockchain technology?

2.

Decentralisation & Security

Another important consideration is the need to increase security for users.

Mass adoption won't happen in an environment where someone can lose their savings through a simple error like private key loss. The vast majority of people don't have that kind of risk-appetite. "Be your own bank" is a meme that has some merits, but it ignores the most important pragmatic consideration: the human factor.

We see some attempts to address this though the creation of trusted chains linked to exchanges with regulatory compliance built in, and through the myriad of decentralised identity solutions. But these remain fragmented, difficult for users to manage outside the resulting vacuum, and ultimately cedes final authority to the singular centralized exchange at the helm of the linked chain.

Question:

How do we increase security and maintain decentralisation?

3.

Fragmentation of Liquidity

One of the outcomes of this fragmentation is that liquidity exists in fragments across the different solutions. This creates a world where liquidity becomes a determiner of success.

On one hand this can be positive, because it is an evolutionary trait that reinforces the selection of winning solutions.

On the other hand, it will almost certainly lead to centralisation. Larger providers, like exchanges, will begin to squeeze smaller ones out and then exert market power, which determines winners based on their fealty or alignment to ideals of those market powers, rather than their innovation.

Individual blockchains try and solve for this with decentralised exchange (DEX) protocols. Inevitably this also introduces more fragmentation and spawns new aggregators with market power.

Question:

How can we solve for liquidity aggregation as well as decentralisation?

4.

Decentralisation & Compliance

It is certain that finance built on transparent decentralised infrastructure will be the future. However, if this is true then it is also true that regulations and compliance will follow. While we have seen huge increases in YoY growth, the aggregate value of the DeFi space is still tiny when compared to TradFi.

Authorities will see this explosive growth, gain a deeper understanding, and will begin to move to regulate the space. Again, we need to be honest about the physical world we exist in, acknowledging that despite the libertarian views in blockchain today, and the nature of the infrastructure being decentralised, humans still exist in this physical world and can become subject to regulations.

We have witnessed several attempts to deal with compliance in blockchains. Exchange chains are one such attempt. There have been others, which have failed to achieve scale despite such an obvious use case for the technology.

This point is clearly illustrated by identity solutions with on-chain tokenised identity protocols. Despite the large number (and theoretical value) of such projects, not one single large exchange has adopted them, even though in many

cases the tokenised asset trades on those same exchanges.

Regulations are not inherently a bad thing. When crafted and implemented thoughtfully, they can protect the public and provide a set of standards to build around. However, we can guarantee that this will become something we need to account for going forward. We can come together to play a role in designing the rules to game or sit idly and await a verdict devised by parties too far removed to understand its impact.

Question:

How can we improve the ability for compliance as well as maintain the benefits of decentralisation?

5.

Multi-chain complexities

Interoperability is a big problem to solve. We see clever emerging solutions to this problem, such as hub and spoke networks like COSMOS or POLKADOT, or atomic swaps between certain networks. Each protocol has their unique approach to "decentralisation", and each approach brings with it varying degrees of fragility; understood immediately or not.

All the approaches must deal with the same issue. Over time, the number of interactions between dozens of protocols, with hundreds of networks will either lead to transaction bottlenecks, more islands of fragmentations, or to massive centralisation.

It's extremely difficult to create direct connections between all the networks and even more difficult to maintain these connections over time. Each new asset and network create ***n*** number of new connections to maintain.

We also see exchanges beginning to struggle to manage the onboarding and then maintenance of new chains. This creates an advantage for those early enough to get in at the beginning, but the listing friction is to the detriment of innovation.

Question:

How can we increase multi-chain interactions, without increasing technical complexity?

6.

Bridging the “TradFi” Gap

There are many exciting opportunities for traditional markets and financial providers to evolve their products, to attract new capital, and to bring new users into this space.

Projects like AAVE, Synthetix, BarnBridge and Bridge Mutual are doing strong work to innovate in the protocol space, leveraging the power of transparency, interoperability and composability.

Despite this, the reality is that large TradFi entities will not cross this bridge without ensuring they cover the risks outlined in these problem statements.

Traditional finance providers are going to want to know that they can enter this space in a compliant way. To do so, they will need to be able to:

- identify the entities involved in the process
- access legal and commercial jurisdictions to resolve issues
- ensure they can provide a safe environment for all their users (not just the subset who are comfortable managing the risks inherent to ultimate decentralisation and self-custody)

Question:

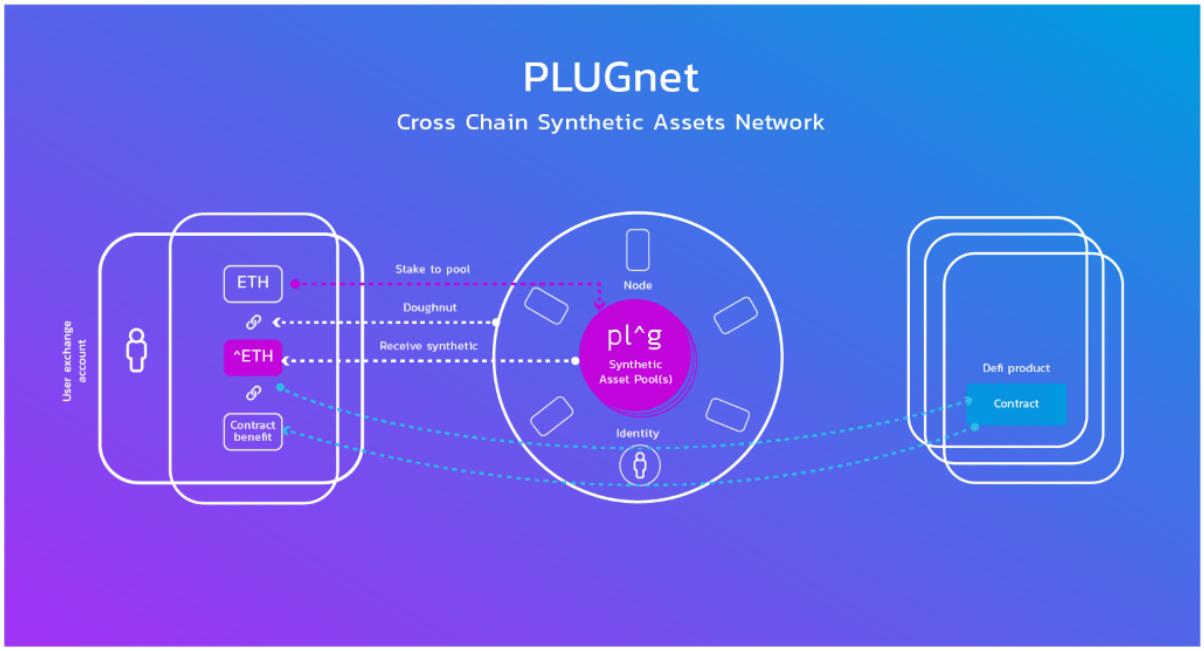
How can we enable the benefits transparency, interoperability and composability of DeFi for regulated entities?

Introducing PL^Gnet:
Multi-Chain Synthetic Assets Network

PL^Gnet enables creation of synthetic assets from multiple chains, which can leverage DeFi in one network, using a simple UX from your existing trusted provider.

PL^Gnet aims to solve the problems identified above by:

- Introducing a new solution to enable deeper liquidity pools for assets from different chains
- Leveraging existing compliance onboarding processes to create shareable attestations, in order to enhance compliance in DeFi for developers and traditional finance providers
- Reduce complexity for assets to exist in the same smart contract network while enhancing existing multi-chain approaches.
- Provide a safer environment for new users to access DeFi products (such as borrowing and lending platforms and derivatives exchanges) without taking on the risks of self-custody
- Enable exchanges, staking providers and custodians to offer DeFi connectivity and leverage assets “at rest” in a novel way



Asset Custodians	PL^Gnet	Products
Authorised Entities • Can create authorise PL^Gnet accounts • Enable their customers to mint synthetic assets • Use synthetic assets to access DeFi products and other uses • Customers can withdraw funds from the exchange to their own wallets, and the linked PL^G synthetic is destroyed	*Synthetic Assets* • Are a token for a claim on the original asset • Allow users to hold their crypto on an exchange or with a custodian they already trust and also use that asset inside of a DeFi environment on PL^Gnet *Nodes* • Decentralised network run by a range of exchanges, custody providers, DeFi developers and token holders	*DeFi Product Creators* • Benefit from high-quality identity, based on exchanges customer KYC/ AML processes (undercollateralized lending) • Create innovative products which consumers can trust – because their underlying asset is in custody • Benefit from the larger liquidity in the synthetic asset pool • Allow multi-chain collaboration and product development

How It Works

The main elements and functions of PL^Gnet

1.

Public Proof-of-Stake Network

- PL^Gnet is a public POS network built using the PL^G toolkit
- PL^G toolkit is a fork of the SUBSTRATE framework, which was chosen due to its flexible architecture and robust, well-tooled developer ecosystem
- PL^G has enhanced the already great work Parity has done with SUBSTRATE by including some novel functionality to enable rich layers of permissions to be embedded into smart contracts and runtime modules
- This novel permissions feature is called the Doughnut protocol and is currently patent pending.
- Doughnuts allow for an enhanced level of user experience, new novel feature sets, as well as easier integration with existing technology stacks. The intention is to add this to the COPA open patent alliance once granted to benefit the wider community
- While synthetic assets created on PL^Gnet will be integrated via trusted asset custodians, the network itself is open, the overarching POS consensus is permissionless and public and the governance of the network will be in the hands of PL^G Token holders.
- This means PL^Gnet will have all the benefits of decentralised, open, transparent, infrastructure while providing a space that can solve some of the problems outlined in this paper.
- PL^Gnet Beta is already live and many of the components that will bootstrap the initial networks have already been built, pending audits.

2.

PL^Gnet and Other Networks

- While PL^G leverages SUBSTRATE, PL^G and PL^Gnet are not intended as competition for DOT or POLKADOT (or other parachain network approaches). PL^G is attempting to solve a fundamentally different problem.
- PL^G will remain compatible with SUBSTRATE and POLKADOT and it's even possible that PL^G could be voted in as a parachain to increase interoperability in the future.
- Neither is PL^Gnet another "ETH KILLER". This line of thinking is counter-productive for the space, which is not a zero-sum game. PL^Gnet still relies on having robust decentralised networks as the primary ledger for asset creation; the more networks the better as more networks = more decentralisation.
- Our competition is not with other blockchain projects but rather the entrenched legacy systems which exist today. We seek to increase user adoption of assets from other networks and introduce new capital and users across a broad spectrum of networks.

3.

Synthetic Asset Pooling

- PL^Gnets key feature is the ability to mint a synthetic asset (pTOKEN) based on assets deposited by users.
- Synthetic minting allows a user to keep their underlying asset secure in a trusted space, then leverage the synthetic asset and put it to work in the DeFi space.
- This dual mode will increase the quantity and breadth of assets available to build into DeFi solutions, while increasing market liquidity by aggregating the power of exchanges who are integrated to PL^Gnet.
- Exchanges can serve as direct ramps for new capital via their fiat onboarding rails, bringing frictionless stable coin and fiat exit ramps to a wider range of DeFi dApps
- These special synthetic assets will only be minted by network approved entities. The initial PL^G Partner Alliance of exchanges, stake farms, liquidity providers and custody providers will bootstrap this process, but in the future new entities will be voted in by the community governance process driven by PL^G Token holders.
- Entities could be either centralised, such as an exchange, or decentralised such as an on-chain protocol from another network who directly integrates. All these decisions will be in the hands of the PL^G governance token holders.

4.

Synthetic Asset Control

A key task of the network is ensuring that the pTOKEN synthetics are consistent with the actual assets in custody.

To achieve this, we propose four viable solutions.

A. **Permissions for minting pTOKENS are for verified entities only.** Verified entities do have legal obligations to the network and reputational risk. While this is not trust minimising, it is better than some of the fragile tethers and wrapped assets who have unknown entities and no legal contract with users. This solution would hold true throughout Phase 1, in the future governance can vote on changing verified entities.

B. **A proof of reserves oracle.** For example, the one provided by Chainlink, will be integrated where exchanges can choose to prove they have reserves backing their synthetics. We will work with Chainlink to help drive adoption of their POR oracle on new L1 networks.

C. **Direct integrations which will lock and unlock underlying assets.** Actioned through custody or cold wallets to a native contract on any supported chain. Phase 2 solution.

D. **PL^G Tokens will need to be staked by each entity in a Safety Vault.** Those tokens can be slashed by the network governance process if anomalies are discovered, which introduces both an incentive for those who discover anomalies, as well as a penalty to those who break the rules.

These solutions offer different degrees of fidelity. Assets created will be tagged with corresponding metadata attestations, allowing users or developers to discern and decide which level they wish to accept risk on.

This will also allow certain synthetics to have a lower risk profile, bringing benefits in DeFi products such as insurance or credit scoring.

The rich permissions features of PL^Gnet will allow developers to explicitly permission which assets, contracts and users can interact with their own contract, in a flexible way with arbitrary levels of complexity.

5.

Identity and Attestations Marketplace

- The PL^Gnet network will have a native attestations protocol implementation. This will allow exchanges to leverage their existing onboarding process and KYC process to create attestations on-chain for accounts that will interact with the network and pTOKENS.
- Native attestations will allow exchanges and regulated entities to be confident about interacting with DeFi protocols.
- Additionally, native attestations are a powerful tool for developers to leverage within products. Use cases include under-collateralised lending, fulfilling KYC obligations, facilitating FACTA compliance, improving reputation mechanics, screening for investor accreditation, understanding governance participation, and many more.
- It is not envisaged that personal data will be stored on chain, just useful metadata. For example {account} is {kyc verified} or {asset x} was minted by {exchange y}.
- PL^Gnet can be used by other blockchain networks as an oracle source for attestations for KYC. A user can verify an account on another network against their account on PL^Gnet, by pulling attestations through. As more entities (such as exchanges) join, a network effect will be created for attestations in the large pool of onboarded accounts.
- PL^Gnet will integrate the SINGLESOURCE application as a third-party identity verifier and leverage the protocol via its CERTI token, so users who have not onboarded via an exchange can also become verified.

6.

Initial Bootstrap Protocols

PL^G will bootstrap the network with initial runtime modules and dApps that support basic critical DeFi functions.

These include:

1. An AMM style DEX
2. The FEE TOKEN EXCHANGE, which allows users to pay fees in any pTOKEN asset on the network improving user experience
3. A non-custodial wallet integration with SYLO for pTOKENs
4. The attestations protocol
5. The pTOKEN synthetic asset module
6. An NFT module
7. Connectivity to the Centrapay global merchant payment network
8. Once these modules are active and in use, we expect that other parties will begin to create new modules or port their projects to operate in PL^Gnet, taking advantage of new users and the greater liquidity created

7.

Governance

The network will initially be governed by the PL^G Partner Alliance founding members. The full member list can be found in the PL^G Partner Alliance section at the bottom of this paper.

Governance of the network will be handed to PL^G Token holders after the initial liquidity mining, bootstrapping of pTOKEN integrations and migration of the PL^G Token to the network.

PL^Gnet will use the on-chain governance features offered by SUBSTRATE to allow the token holders to dictate how they want the network to evolve. We expect the governance token to govern elements including:

1. Who can mint synthetic pTOKENS. We expect this process to run in a similar manner as bidding for a PARACHAIN slot in a hub and spoke network.
2. What modules are added to the network
3. Which DeFi projects are promoted from testnet to mainnet
4. Network fees
5. Network upgrades

Governance Roadmap

PL^Gnet will be implemented in a phased release process, allowing for testing and security.

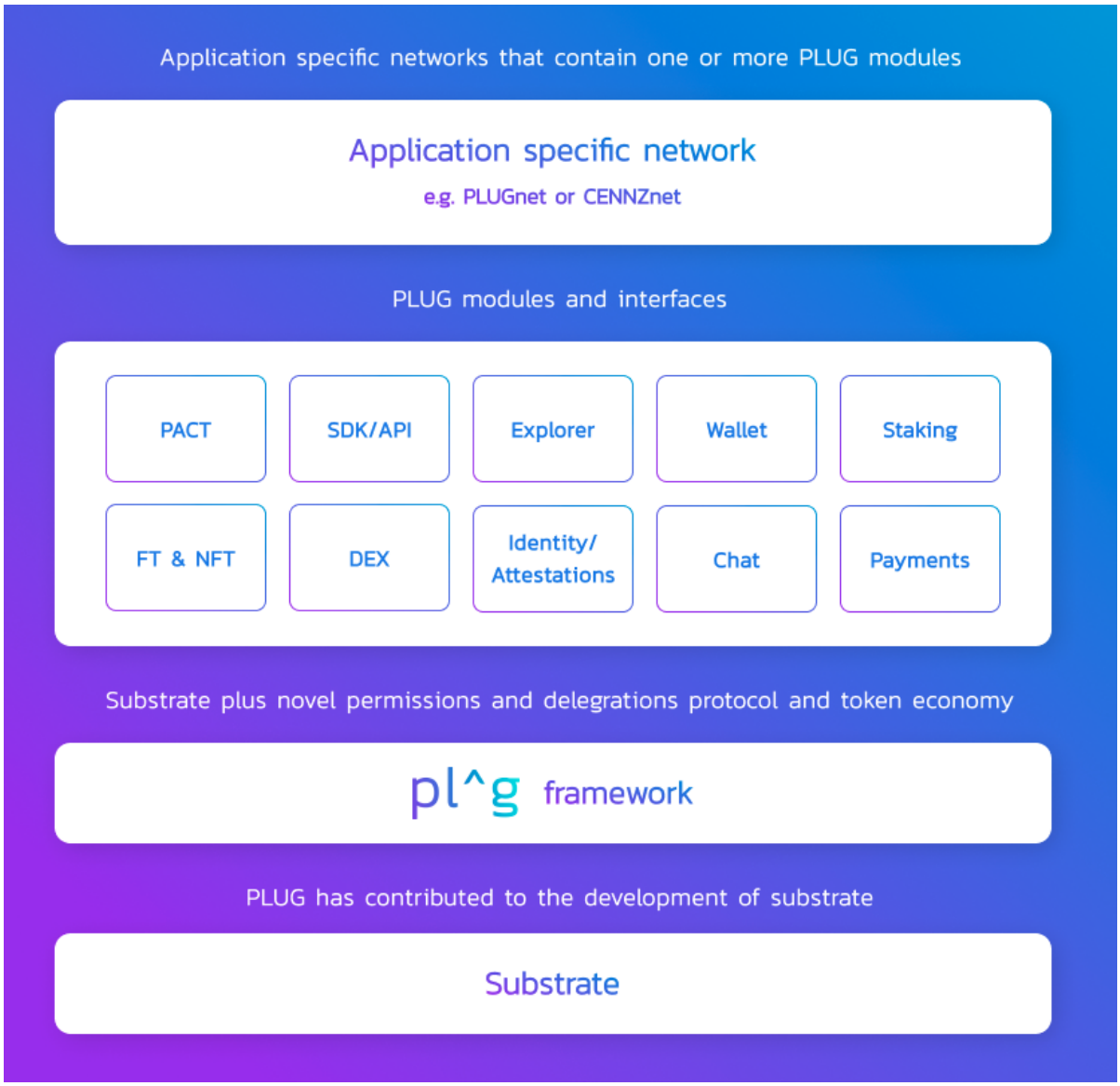
- In Phase 1, the network will be integrated with a small number of assets and decentralized applications (dApps) one at a time.
- Initially no deposits or withdrawals will be enabled. Participants will be able to import their ERC20 PL^G Tokens and claim staking rewards.
- Next, deposits will be enabled and the first pTOKENS can be minted.
- In Phase 2, withdrawals will be enabled.

Activity	Phase 1	Phase 2
Run a node	PLUG + Custodians	Anyone
Act as a validator	PLUG + Custodians	Anyone
Create smart contracts	PLUG + Exchanges + Select Product Creators	Anyone
Issue synthetic assets	Exchanges	Exchanges

Technology Framework

PL^G starts with an underlying framework including our patent-pending Doughnut permissions protocol.

PL^G modules are built and added on a chain-by-chain basis. The modules are primitives for building decentralised finance applications.



PL^G Protocol Unique Value Proposition: Doughnuts Permissioning

What are Doughnuts?

Blockchain technology requires powerful, seamless authentication and access control.

Ease of authentication is a big contributor to the success of centralised services, which provide excellent user sign-in experiences. The success of this model is illustrated by the widespread adoption of Single Sign-On (SSO) models.

The failure of DApps to achieve mainstream adoption persists in part because the authentication experience lags so far behind centralised applications.

Given the dangers of private key transmission and the high consumer demand for good UX and security, a system other than signing devices and identity contracts is needed.

Doughnuts solve this problem. The concept is simple yet powerful, enabling a familiar "centralised" experience for users, while still leveraging (but obfuscating) essential trustless, decentralised technologies.

A Doughnut is an attenuated permissions certificate issued off-chain from one private key (the issuer), usually to another private key (the holder).

On PL^Gnet, Doughnuts will allow:

- Identity delegation: the holder acts as the issuer, with a subset of permissions
- Fee delegation: the issuer pays for the fees of the holder when specific resources are accessed
- Contract access control: the holder may access special features in a smart contract or runtime module
- And many more

Doughnuts are generated, stored and transmitted off-chain, and may be verified anywhere. This makes them cheap to manage and use.

If a holder is specified, the Doughnut is only valid when paired with a signature from the holder, helping to mitigate cases where the certificate is stolen.

To recap, Doughnuts are cryptographically verifiable access tokens, carrying permissions, generated off-chain.

Naming

Why “Doughnut"?

Doughnuts fulfil the roles of cookies from Web2.0 but in a decentralised way. It's take on the "Cookie" and "Macaroon" naming convention.

Doughnuts are decentralised 

Existing Solutions

Blockchain access control is currently focussed on two solutions:

1. Transactions submitted by applications are signed by a signing device
2. Transactions signed by an application are "executed" by a permissioned identity smart contract

These approaches may be used together in several ways.

Goals

Permissions **MUST** be actively granted rather than passively assumed

Permissions **MUST** be enforceable for all addresses and contracts

Permissions **MUST** protect users as much as possible from malicious applications

Doughnuts **MUST** be cheap to generate, store, use, transmit and modify

Doughnuts **MUST** be optional, and not modify default blockchain behaviour when not in use

Doughnuts **MUST** be non-viable if stolen

Doughnuts **MUST** be revokable by the issuer or holder at any time

Doughnuts **SHOULD** optionally support off-chain service authentication

	Pros	Cons
Signing device	• Applications don't need to hold keypairs • No fee associated with sharing authority between apps	• User must approve every signature manually • User must check every transaction for malicious activity • No way to prevent an unexpected internal transaction call • User must have access to the device while using applications
Identity Contract **ERC725, ERC1056, etc**	• Supports multiple applications controlling one address without another application or device signing • May support granular permissions • May support TTL and revocation • May authenticate for off-chain services • May support one-use access control	• No way to prevent an unexpected internal transaction call • Must pay regular network gas fees • Gas fee associated with managing authority between apps • Gas fee involved in setting up some contracts (does not apply to ERC1056 or other similar registry implementations) • Applications cannot rely on one standard, shared access control specification

Doughnut	• Limited permissions by default • Enforces permissions for the full internal transaction tree • Supports TTL and revocation • Cheap off-chain generation, modification, transmission and storage • Full support for granular blockchain permissions • May be used to flag suspicious app activity to users • May authenticate for off-chain services • May support third-party authenticators (Similar to Macaroons) • May support one-use access control • Many more...	• Requires some modification of the blockchain proof validator and VM • Doughnuts will add to transaction sizes • Possible to offset cost in-chain • Possible to reduce size w/ transaction-specific doughnuts and optimised storage

PL^G Framework PACT DSL

To improve the developer experience and the user experience, we found it necessary to improve the way contracts were written, ensuring that smart contracts could become human readable.

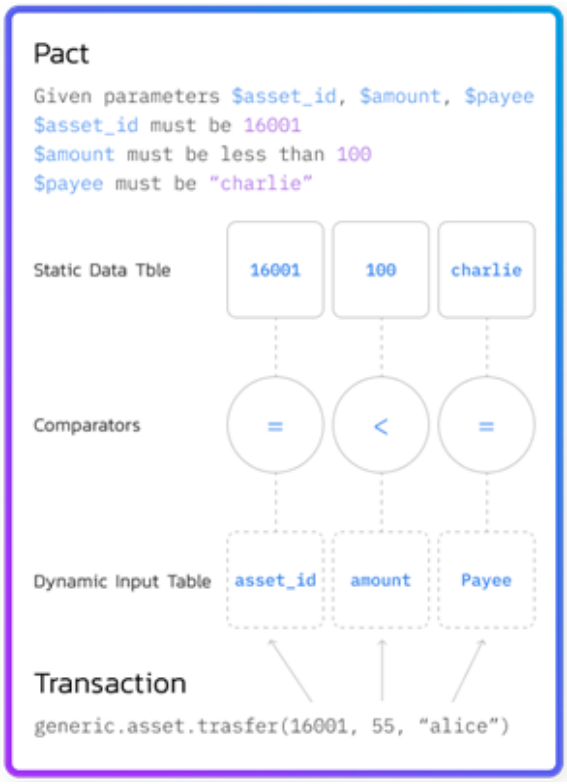
If we hold to the “trust but verify” mantra and we want mass adoption of this technology, then users should not have to outsource trust to third parties to verify contracts. They should be do this themselves in a human friendly way.

One widespread problem in blockchain is many users cannot easily understand the functions of a contract, and many developers make errors in the development of smart contracts. We developed the PACT DSL to enable the creation of Ricardian style smart contracts that interact with our doughnuts protocol.

Processing Speed / Computational Efficiency

Many projects try to solve scaling or performance problems by finding novel consensus mechanisms or reducing the decentralisation of the network. In distributed systems the limitation is at the network layer. Only so much information can be synchronised between distributed nodes in each period.

Our approach has been that, given these physical network constraints are limited by physics (barring any advancement in quantum networking), on-chain computation will always have performance limits. So how do we improve performance and increase decentralisation?



Using our Doughnuts protocol and PACT framework, we've been able to minimise on-chain interactions and refocused them to enforce off-chain interactions.

- PACT is an embedded contract DSL and toolchain for Doughnuts in the {plug network} permission domain.
- PACT contracts are written in a simple bytecode and execute against dynamic input data to ensure their invariants are upheld.
- It is designed for integration with the blockchains built with the *PL^G framework blockchain runtime* to enable safe, powerful delegated transactions.
- It supports high-level English, like language and compiler. This allows writing human readable "pacts" that the toolchain can interpret, achieving the notion of Ricardian contracts.

Problems Solved

The PL^Gnet approach moves the thought space for decentralised networks forward and can help solve some of its pressing problems.

Decentralisation & Usability

PL^Gnet helps encourage decentralisation by allowing networks to aggregate the user experience, and for networks that are not currently smart contract enabled to leverage smart contracts for their assets.

PL^Gnet also helps users to access DeFi protocols in a safe space, with their underlying assets protected from failures or frauds.

Decentralisation & Compliance

PL^Gnet allows regulated entities to enhance their ability to interact with DeFi in a more compliant way, without requiring a “kingmaker” in the decentralised identity space or sacrificing network decentralisation.

Fragmentation of Liquidity

PL^Gnet allows liquidity and users from a wide range of providers to aggregate that liquidity to enable better products for users, without complex network to network integrations.

Bridging the “TradFi” gap

PL^Gnet allows traditional finance players to leverage DeFi in an environment that is safer for users and allows them to manage compliance risks better.

PL^Gnet works for Asset Custodians

Build on the trust you have with your clients to help them do more with their assets.

New ways to earn. I can get rewarded in different ways for holding digital assets.

Easy to do. Pooling (and maybe even product selection) can be done through the familiar interface of my exchange.

Access new products with low risk. Underlying collateral is protected.

Use multi chain assets in a single DeFi application.

Grow value. Offer new products to your customers.

Retain your asset base. Users don't have to move their assets off-exchange to participate in DeFi, earn rewards, and access new products

Curate products. Choose what products your users can access with their synthetics, through your interface a new "DeFi Listing" revenue stream

Offer pool rewards. Set the type and level of offers to users

Unparalleled liquidity. Synthetic asset pools combine the liquidity of transactions from all participating exchanges. When fully established, PL^Gnet's eventual liquidity could be the world's largest pool, vastly exceeding individual chains or DeFi exchanges.

Shared identity. PL^Gnet can build up a singular attested user profile between exchanges. Product creators and exchanges can leverage, trade and inherit KYC and AML compliance, helping create safer DeFi products or decentralised credit ratings.

Secure innovation. DeFi product creators can innovate, and asset owners can access new products with safety. If the smart contract on an ambitious new product fails, the underlying asset remains in the owners' exchange wallet.

The PL^G Token

PL^Gnet is powered by the PL^G Token. The PL^G Token fills multiple uses in the network economy.

Proof of Stake

- PL^G is the native asset used to stake and secure PL^Gnet consensus.

Governance

- PL^G is used to make decisions on network Governance.

Collateral

- PL^G is used as a safety deposit for pTOKENS (synthetic assets).

Gas Fees and Block Reward

- Fees are paid in the exchanges native token (multiple tokens are able to be supported) This way the user already has GAS once they have onboarded.
- Block rewards are a basket of the GAS paid.
- PL^G will be the default token for those who do not have an exchange token.

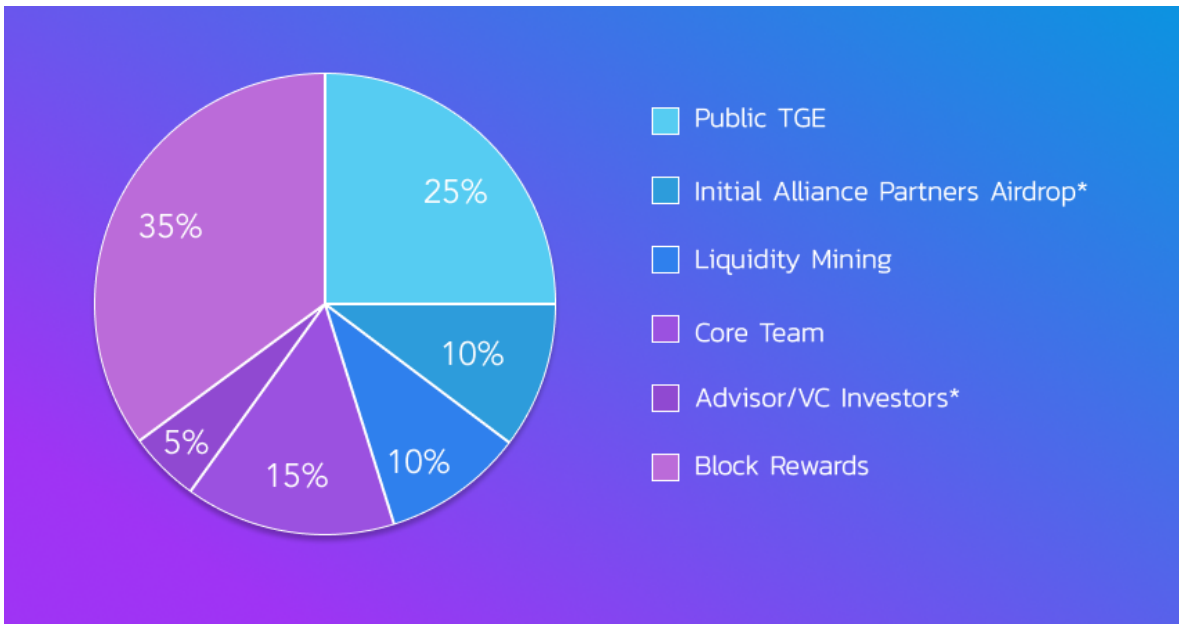
Token Details

- PL^G is currently an ERC-20 token.
- It will be migrated to the PL^Gnet as a native PL^G Token in line with the roadmap. There are 10 billion PL^G Tokens on issue. PL^G Tokens will be used as follows.

Distribution

- The original PL^Gnet whitepaper envisioned several stages of distribution of the token. The token distribution model has evolved since 2018 and we propose an adjusted model to align to the current market conditions.

See outline of the intended distribution model, next page.



Token Allocations

Token Generating Event

This phase has been completed and the community has been distributed their tokens.

Initial Alliance Partners

10% of the tokens will be airdropped to the initial PL^Gnet Alliance Partners in exchange for bootstrapping the networks by integrating PL^Gnet into their solutions, listing the PL^G Token and providing liquidity to PL^Gnet and PL^G Tokens.

Liquidity Mining Pool

10% of PL^G Tokens will be allocated for liquidity mining. We will be completing this phase on the ETH network before migration of the token to the PL^G mainnet.

1. **Pool 1 will be a PL^G/ETH** pool allocating 350m tokens. This will help bootstrap liquidity and attract new community members to the updated vision for PL^Gnet.

2. **Pool 2 will be a PL^G/PL^G** pool allocating 150m tokens. This will allow existing PL^G Token holders to be rewarded for their early commitment to PL^G and for their loyalty while we have been building the PL^G Partner Alliance.

The remaining 500m tokens for liquidity mining will be held for further pools like Proof of Partnership, and liquidity collaborations with PL^G Partner Alliance projects.

Treasury

35% of PL^G Tokens will be allocated to the treasury earmarked for incentives (exchange integration, user yield, gas fee subsidization, synthetic liquidity pools, etc.)

Core Team Allocation

15% PL^G Tokens will be allocated to the core team in PL^G

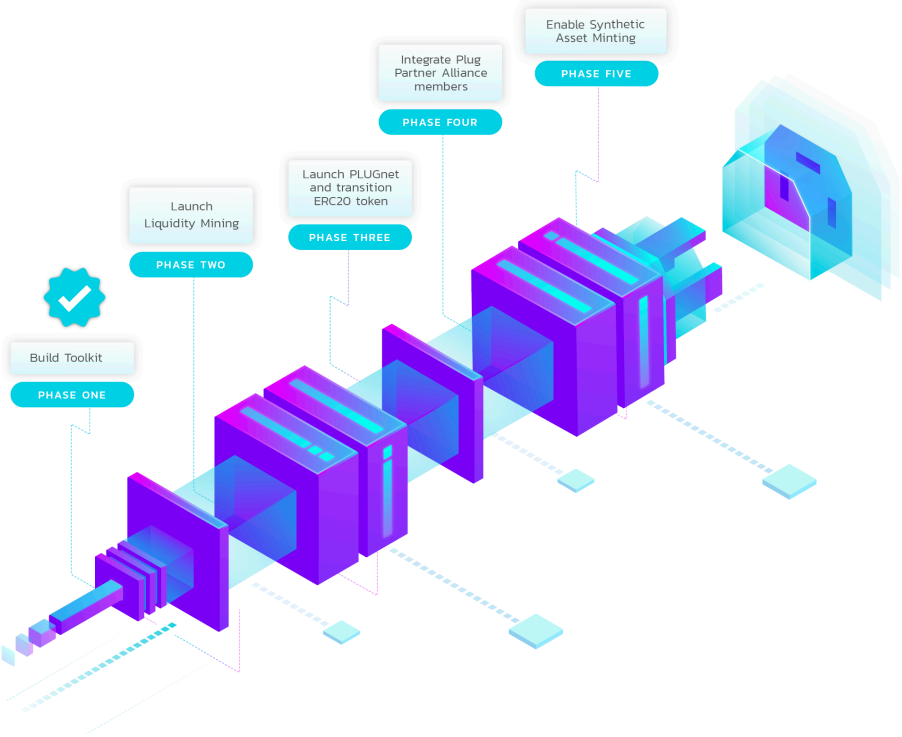
Advisor & VC Pool

5% Of PL^G Tokens are to be allocated to advisors and VC investors of the project.

Token Information

Token Type	**Max and Circulating Supply**
ERC-20	10,000,000,000 Max 2,483,114,755 Circulating (March 2021)
Token Code	**Token Contract Address**
PLUG	0x47da5456bc2e1ce391b645ce80f2e97192e4976a

Project Roadmap



PL^Gnet Core Team

Jerry Yuan, CEO

Co-founder and angel investor, Jerry has 15 years experience across the Telcommunications, ICT and Blockchain industries, providing partnership value to a range of large projects. In 2016, Jerry founded Centrality and helped raised over $200 million in the initial ICOs. Jerry has strong global commercial network relationships, particularly in the Asia-Pacific region.

Phil Williams, CPO

Phil is a technology strategist with deep knowledge and experience across a range of industries.

He has led product teams at publicly listed technology companies, digital agencies and founded his own startups. His career has included senior and executive roles in Product Direction (SaaS), Technology Investment Analysis (Corporate Acquisition and VC), Strategic Business Development (Tech), Human Centred Design & Product Development, and Innovation Programme Leadership.

Jeffrey McDonald, COO

Jeffrey has 21 years working within Technology, Finance and Marketing.

Jeff has an expert knowledge in the blockchain, finance and technology industry, with roles in an ever-growing number of leading projects. His experience is key to ensuring businesses grow and perform with sustainable and responsible practices. Jeff holds a MSc in Information Technology Management, jointly accredited in New Zealand by the University of Auckland, and University of Richmond in the USA.

Jordan Beauchamp, CTO

Jordan was handpicked by the executive team to help us build and grow the tech stack of the Centrality ecosystem.

His experience as an enterprise developer within large corporates, as well as his background in data engineering gives him a unique perspective on building blockchain networks that prioritise the user experience. Research interests include decentralised governance and Ricardian smart contracts (or how to put smart contracts in the hands of normal people).

Advisors & Technology Partners

Aaron McDonald

Aaron is a 20-year tech industry veteran with experience leading teams across all aspects of a technology company managing portfolios over $1b in value. Aaron founded Centrality a venture portfolio that leverages decentralised technology to create new market innovation and customer experiences. Aaron is a board member or advisor to more than a dozen venture companies around the world. In 2018 Aaron was awarded EY Entrepreneur of the Year for the technology and emerging industries category.

Tyler Ward

Tyler is the co-founder of BarnBridge a DeFi risk tranching protocol, and novel content creation ecosystem Non Fungible Universe. He is also the founder of Proof Systems. Tyler has worked with ConsenSys, Earn.com (acquired by Coinbase), FOAM, Dether, Grid+, Centrality, Sylo, NEAR Protocol, DARMA Capital, SingularDTV & the snglsDAO. He started working in crypto in late 2016 & has bought and sold numerous eCommerce companies.

Akin Sawyer

Akin spent fifteen years in management consulting, secondary mortgage finance, and international development. Akin was previously the Strategy and Africa Lead for Decred. He also serves as a Non-Executive Director of Splash Mobile Money and is an advisor to EMTech, a Central Bank Digital Currency platform.

He led strategic and organization transformation projects at Booz Allen Hamilton and Accenture in Washington, D.C., and held strategy and business analysis positions with Freddie Mac and Fannie Mae. He started his career at the International Monetary Fund (IMF) in the Technology and General Services Group where he conducted economic research and data analysis in support of IMF country strategies across Africa, Asia and Europe.

He holds a Bachelor of Arts (BA) in Economics with a minor in Political Science from Union College, New York, and a master's in business administration (MBA) from The Amos Tuck School of Business at Dartmouth.

SYLO

Sylo is an ecosystem made up of digital consumer wallet software, applications, infrastructure & developer tools to usher in a world of Smart Money

Proof Systems

As a full-service digital marketing agency our capabilities range from branding, design, & UI/UX to advertising and marketing. We work with clients to simplify their brand story and messaging, so they are approachable and digestible for customers and users.

X8C

X8C is an integrated social marketing agency with the resources to move markets.

Our team of marketing professionals provides essential market coverage across the leading trading channels to cut through the noise and ensure your brand stands out.

X8C has specific expertise in creating highly effective marketing campaigns that recognize the nuance of the blockchain industry. We achieve exceptional results and leverage an extensive media and influencer network to create visible and resonant campaigns that establish thought leadership for our clients

Centrality

Centrality is a world-leading blockchain development studio and tech venture platform. They leverage decentralised tools, AI, IoT and other emerging technologies to create an advanced and connected world. They're fostering a user-centric approach and open-source culture to build the infrastructure for the emerging decentralised web. Centrality's mission is to build an ecosystem that always puts the users first, brings everyday people to blockchain, and ultimately leads to mass adoption. The Centrality ecosystem serves more than 1m active users.

SUMMARY OF RISKS

The possessor of this white paper hereby acknowledges and confirms to Plug New Zealand Limited (the Company) that it has reviewed, and is fully aware of, all the following risk factors (which do not purport to be exhaustive) that may apply to it as a purchaser or holder of PL^G Tokens, is willing to assume such risks, and has sought relevant professional advice (whether legal, financial, tax, technical, operational or otherwise) prior to making its decision as to whether to purchase PL^G Tokens:

System risk of Delivery interface: There can be possible delays and a failure or inability to effect the Delivery on time for a variety of reasons including but not limited to the Applicant's own acts or omissions, technical and/or operational glitches, system or network overloads arising from or in connection with the Ethereum network, any other platform or otherwise.

No assurance of returns or benefits: There can be no assurance that the Applicant as a party to this Agreement or purchaser or holder of PL^G Tokens will be able to receive a return of its capital or any returns or benefits. Having purchased the PL^G Tokens, the Applicant may suffer a total loss on the entire amount paid.

Market risk: The value of cryptocurrencies can go down as well as up. The emergence of a new business model can create opportunities for users and investors, but any young market carries significant risks for all of its participants. Past performance is not a reliable indicator of future performance, and investors may not recover the full amount invested.

Regulatory risk: Regulation of digital tokens (including the PL^G Tokens) and token offerings, cryptocurrencies (including ETH), blockchain technologies (including the provision of financial services using such technologies), and cryptocurrency exchanges, among other things, are relatively undeveloped and likely to rapidly evolve, and vary significantly among various jurisdictions and are subject to significant uncertainty.

New or changing laws and regulations or interpretations of existing laws and regulations may adversely impact the liquidity and market price of PL^G Tokens, the ability to provide certain services via, or conduct certain activities on, the Plug Platform, the Applicant's ability to access marketplaces on which to trade PL^G Tokens, the Plug Entities' ability to operate as an ongoing concern, and the structure, rights and transferability of PL^G Tokens. The ability of the Applicant to access, use, transfer and exchange its PL^G Tokens may be affected by changes to legislation, regulatory guidance or actions, and judicial decisions in New Zealand and in other countries. Therefore, there can be no assurance that any new or continuing regulatory scrutiny or initiatives will not have an adverse impact on the value of PL^G Tokens and otherwise impede the Plug Entities' activities.

No regulatory protection: The Company is not licensed or approved by the FMA nor by the regulatory bodies of any other jurisdiction, and currently there is no intention for the Company to apply for any financial services license or regulatory approval under the laws and regulations of New Zealand or any other jurisdiction, in effect as at the date of this Agreement. In addition, the PL^G Tokens do not constitute, and are not characterised as, any of the Regulated Products. Therefore, the Applicant will not be able to invoke or avail itself of any regulatory protection or remedies applicable in respect of such Regulated Products under the laws and regulations of New Zealand in effect as at the date of this Agreement, in relation to its entry into this Agreement and purchase, holding, sale, trading, acquisition, disposal or usage of PL^G Tokens.

Legal risk: There is little or no precedent on how existing laws might treat the sale, issue, fungibility, settlement finality, transfer, collateralisation, sequestration, loan, hypothecation, redemption or other disposition of PL^G Tokens. There is also little or no precedent on how existing laws might treat the rights and obligations between and among the Company and the Applicant as a purchaser or holder of PL^G Tokens. The occurrence of any related issue or dispute could have a material adverse effect on the Plug Platform, the Plug Entities' businesses and/or the PL^G Tokens. New developments in the laws and regulations may also adversely affect the legal or regulatory treatment of the PL^G Tokens, the Plug Platform and/or the Plug Entities' businesses. The regulatory, tax and policy environment in which the Company operates is evolving and subject to changes in law or interpretations of existing laws, or the promulgation of new laws and regulations. Such changes may adversely affect the Company's business, financial condition and prospects, to the extent that the Company is unable to comply with such changes in law. Further, there can be no assurance that governments may not implement new regulations which will require the Company to obtain additional approvals and licenses from regulatory bodies or impose new taxes or onerous requirements and conditions on the Company's operations.

Tax risk: The tax characterisation of PL^G Tokens is uncertain and the Applicant should consult its own tax advisors regarding the tax consequences of its acquisition, receipt, holding, trading or disposal of PL^G Tokens. A purchase or receipt of PL^G Tokens may result in adverse tax consequences to the Applicant. The Applicant should consult with and must rely upon the advice of its own tax advisors with respect to the tax consequences whether of New Zealand or elsewhere of a purchase or receipt of PL^G Tokens, and is wholly responsible for understanding and meeting all their tax obligations whether of New Zealand or elsewhere in relation to their acquisition, receipt, holding, trading or disposal of PL^G Tokens. Any payments that are made by the Company to any PL^G Token holder will be made after the deduction of any withholding taxes, if so applicable, whether of New Zealand or elsewhere. If any New Zealand goods and services tax at the rate of 15% (or such other rate as required by law) or other similar or equivalent tax applicable elsewhere is chargeable on the Delivery, holders that purchase or receive such PL^G Tokens shall bear such New Zealand goods and services tax or other similar or equivalent tax applicable elsewhere in addition to the Purchase Price.

Company risk: The Company was incorporated on 8 October 2019. The Company is subject to all of the business risks and uncertainties associated with any new business. These new business risks include and are not limited to acquiring and retaining customers and vendors, expansion of the business, inability to accurately forecast demand, cash flows, foreign currency exchange rate fluctuations, inability to enter into favorable contracts, and retaining and hiring key employees.

Related party transaction risk: The Company may in the ordinary course of business enter into transactions with certain related parties. There can also be no assurance that the Company will be able to maintain existing terms, or in case of any future transactions with related parties that such transactions will be on terms favorable to the Company. There can be no assurance that in all such transactions, the Company could not have achieved more favorable terms than the existing ones and would not raise conflicts of interest issues.

Lack of voting and liquidation rights: This Agreement and the PL^G Tokens do not carry any voting, management or control rights or other management or control rights in the Company. Accordingly, the shareholders of the Company will control decisions of the Company, including any significant corporate transactions, or the election to liquidate or dissolve the Company. In addition, upon a liquidation, bankruptcy or other dissolution of the Company, the Applicant as a party to this Agreement or a purchaser or holder of PL^G Tokens will highly likely not be entitled to liquidation rights or other claims.

Key person risk: Whilst Centrality and the Company take an active role to managing key man risk through training, systemisation, and succession planning there is still a risk that loss of a key team member could cause delays to the Plug Platform development and thus having a detrimental effect on price of PL^G Tokens.

Technology and coding risk: Blockchain and smart contract technology is still in an early development stage and its application is of an experimental nature which carries significant operational and technological risks. It is possible that the Smart Contract, the Smart Contract System or elements of the Plug Platform could contain weaknesses, vulnerabilities or bugs which could cause, *inter alia*, the complete loss of the Applicant's utility and/or the value of the PL^G Tokens and/or the Plug Platform by impacting on their operation and functionality. Outside actors may exploit such errors or vulnerabilities for personal gain or the PL^G Tokens and/or the Plug Platform may be affected in any event without such action.

Plug Platform risk: While Plug New Zealand Ltd and Centrality have procured the development of, and will continue to develop the Plug Platform, there is no assurance that the Plug Platform will be designed or completed in the manner described in the Plug Whitepaper and there is no assurance as to the continued operation and functioning of the Plug Platform. The Plug Platform is subject to change and no representation is given that the any function or aspect of the Plug Platform will continue to be provided or made available at any time. It should be noted that the development of the Plug Platform, and its evolution in other generations/versions (which may include deviations from what is envisioned in the Plug Whitepaper) may not be solely determined by the Company, but may be determined by the consensus of users of the PL^G Tokens in accordance with rules (including as to allocation of influence) which are set out (and may be updated) in the Plug Whitepaper and/or the terms and conditions of use of the Plug Platform.

Trading/valuation risk: As a utility token, the inherent value of PL^G Tokens is derived from the successful operation of the Plug Platform. PL^G Tokens are not pegged to any fiat currency (legal tender backed by a sovereign government) nor any cryptocurrency, and the exchange value from time-to-time given to PL^G Tokens on third-party exchanges may not always reflect the Applicant's intrinsic valuation of the PL^G Tokens. The risk of loss when purchasing or disposing of PL^G Tokens could be substantial and losses may compound quickly (including up to a total loss). As a token built on top of the Ethereum network, the value of PL^G Tokens may be affected by the valuation from time-to-time of ETH against fiat currencies and other cryptocurrencies.

Illiquidity risk: Should the Applicant wish to temporarily, permanently or partially exit the Plug Platform ecosystem, it may be unable to liquidate its position by exchanging PL^G Tokens for fiat currency or cryptocurrency as there may not be a willing buyer for its PL^G Tokens both in terms of price and volume. The Applicant as a holder of PL^G Tokens has no right to redeem or sell its PL^G Tokens. Although the Company intends to list the PL^G Tokens on several cryptocurrency exchanges, there can be no assurance that such exchanges will accept the listing of PL^G Tokens or maintain the listing if it is accepted. There can be no assurance that a secondary market will develop or, if a secondary market does develop, that it will provide the Applicant with any liquidity or that it will continue for the life of the PL^G Tokens. There is also no guarantee from any central bank or centralised authority for PL^G Tokens that ensures the Applicant will be able to redeem its PL^G Tokens for fiat currency or cryptocurrency. Furthermore, the digital token market is a new and rapidly developing market which may be subject to substantial and unpredictable disruptions that cause significant volatility in the prices of digital tokens. There is no assurance that the market, if any, for the PL^G Tokens will be free from such disruptions or that any such disruptions may not adversely affect the ability of the Applicant as a holder of PL^G Tokens to sell its PL^G Tokens.

Network risk: PL^G Tokens are ERC-20 compliant tokens built on top of the Ethereum network, a decentralised network containing, among other things, both cryptocurrency and smart contract protocols. None of the Plug Entities has control over the Ethereum network, including confirmations of transactions and execution of smart contracts on the network. Should the Ethereum network experience temporary or permanent issues, including network slowdowns or transaction confirmation delays, this is likely to affect the ability of the Applicant as a holder of PL^G Tokens to freely use PL^G Tokens within the Plug Platform ecosystem and could impair the usability of the Plug Platform generally.

Cyber security risk: The nature of PL^G Tokens, the Ethereum network and any blockchain networks in general may lead to an increased risk of fraud or cyberattack and may mean that technological difficulties experienced by the developers and users of the Plug Platform ecosystem (including any wallet developed specifically for use on the Plug Platform) could prevent access to or use of the Applicant's PL^G Tokens. For example, it is possible that an unauthorised third party could exploit a coding vulnerability in the Plug Platform code and damage, interrupt or otherwise attack it.

Private key risk: Extreme caution must be taken whenever selecting, storing or transmitting private keys for PL^G Tokens. The Applicant is responsible for the storage of its PL^G Tokens. If another person obtains access to the Applicant's private keys, they can steal its PL^G Tokens or the other cryptocurrencies it uses to purchase PL^G Tokens. Furthermore, if the Applicant loses access to its private keys, neither the Plug Entities nor any other entity will be able to recover the Applicant's lost PL^G Tokens or cryptocurrency. If the Applicant holds PL^G Tokens on a cryptocurrency exchange, the private keys to those PL^G Tokens are held by that exchange. Should that exchange be hacked or otherwise compromised, the Applicant's PL^G Tokens may be stolen or otherwise become inaccessible.

Wallet risk: Should the Applicant attempt to send PL^G Tokens to a wallet type that does not support PL^G Tokens, its PL^G Tokens may be lost forever.

Broker, dealer or exchange insolvency risk: There is a risk that brokers, dealers, exchanges or wallets could become insolvent or otherwise become insecure. There may be practical or timing problems associated with enforcing the rights to assets in the case of an insolvency or security disruption of any such party.

Financial risk: If the solvency of the Company ot its associated entities is impaired, the ongoing viability of the Plug Platform and the utility and value of the PL^G Tokens may be impaired.

General risks:

The growth of the blockchain industry in general, as well as the blockchain networks on which the Company relies, is subject to a high degree of uncertainty. The performance of the Plug Platform is subject to the following uncertainties, among others:

(a) worldwide growth in the adoption and use of BTC, ETH and other blockchain technologies;

(b) government and quasi-government regulation of BTC, ETH and other blockchain assets and their use, or restrictions on or regulation of access to and operation of blockchain networks or similar systems;

(c) the maintenance and development of the open-source software protocol of the BTC or ETH networks;

(d) changes in consumer demographics and public tastes and preferences;

(e) the availability and popularity of other forms or methods of buying and selling goods and services, or trading assets including new means of using fiat currencies or existing networks;

(f) general economic conditions and the regulatory environment relating to cryptocurrencies and digital tokens;

(g) hacking and theft of cryptocurrencies and digital tokens; and

(h) popularity or acceptance of the BTC or ETH networks and the emergence of new cryptocurrencies, digital tokens and blockchain networks.

The price of BTC, ETH, digital tokens and other blockchain assets are subject to dramatic fluctuations. Several factors may affect price, including, but not limited to:

(a) global blockchain asset supply;

(b) global blockchain asset demand, which can be influenced by the growth of retail merchants' and commercial businesses' acceptance of blockchain assets like cryptocurrencies as payment for goods and services, the security of online blockchain asset exchanges and digital wallets that hold blockchain assets, the perception that the use and holding of blockchain assets is safe and secure, and the regulatory restrictions or prohibitions on their use;

(c) investors' expectations with respect to the rate of inflation;

(d) changes in the software, software requirements or hardware requirements underlying a blockchain network;

(e) changes in the rights, obligations, incentives, or rewards for the various participants in a blockchain network;

(f) currency exchange rates, including the rates at which ETH and BTC and other cryptocurrencies or digital tokens may be exchanged for fiat currencies;

(g) fiat currency withdrawal and deposit policies of blockchain asset exchanges and liquidity on such exchanges;

(h) interruptions in service from or failures of major blockchain asset exchanges;

(i) investment and trading activities of large investors, including private and registered funds, that may directly or indirectly invest in blockchain assets;

(j) monetary policies of governments, trade restrictions, currency devaluations and revaluations;

(k) regulatory measures, if any, that affect the use of blockchain assets;

(l) the maintenance and development of the open-source software protocol of the BTC or Ethereum networks;

(m) global or regional political, economic or financial events and situations; and

(n) expectations among blockchain participants that the value of blockchain assets will soon change.

Blockchain networks are based on software protocols that govern the peer-to-peer interactions between computers connected to these networks. The suitability of the networks for the Plug Entities' businesses or the functionality of the PL^G Token depends upon a variety of factors, including:

(a) the effectiveness of the informal groups of (often uncompensated) developers contributing to the protocols that underlie the networks;

(b) effectiveness of the network validators and the network's consensus mechanisms to effectively secure the networks against confirmation of invalid transactions;

(c) disputes among the developers or validators of the networks;

(d) changes in the consensus or validation schemes that underlie the networks, including shifts between so-called "proof of work" and "proof of stake" schemes;

(e) the failure of cyber security controls or security breaches of the networks whether on the Plug Platform, or technological assets, or the Applicant's or any third party's network or devices, and the associated risks of legal action or actions of regulators relating to loss of data, damage to data or devices, threat or compromise to privacy and data protection, and the occurrence of fraud or harm;

(f) the existence of other competing and operational versions of the networks, including without limitation so-called "forked" networks;

(g) the existence of undiscovered technical flaws in the networks;

(h) the development of new or existing hardware or software tools or mechanisms that could negatively impact the functionality of the systems;

(i) the price of blockchain assets associated with the networks;

(j) intellectual property rights-based or other claims against the networks' participants and risks associated with such legal claims (including but not limited to the risk that the operation of the Plug Platform is disrupted by such claims including claims for remedies such as injunctions); and

(k) the maturity of the computer software programming languages used in connection with the networks.

The performance and business of the Company depend substantially on the overall global economic conditions. Global economic downturns, coupled with the global financial and credit market disruptions, has had and continue to have an adverse effect on global business. Any slowdown in economic growth in New Zealand, and other geographies, could also adversely affect the Company's business, financial condition and results of operations.

Political, economic or other factors that are beyond the Company's control may have an adverse impact on its business and financial condition. Political instability, resulting from a change in government or in economic and fiscal policies, may adversely affect economic conditions in the geographies in which the Company operates.

Natural disasters in the geographies, including earthquakes, floods, in which the Company operates may disrupt or adversely affect the economy and the business, condition and prospects of the Company.

Civil unrest, acts of violence, terrorist attacks or war in geographies in which the Company operates may adversely affect the financial markets, which may impact the Company's business, condition and prospects.

Unfavorable developments or characteristics of any of the above circumstances could adversely affect the Plug Entities' businesses, the Plug Platform, or the proper functioning of the PL^G Tokens.