GreenCoin Whitepaper

Unlocking a Sustainable Future
with Carbon-Neutral Tokens

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BACKGROUND

GreenCoin Initiative

The GreenCoin initiative has set out with the aim to create effective economic incentives that encourage the utilization, conservation and exploitation of carbon assets, with the added benefit of making it easier for individuals and organizations to obtain carbon credits and get rewarded for low carbon behavior. The end goal is to facilitate the widespread adoption of these sustainable practices.

Our initiative will kick off with the establishment of a cutting-edge carbon capture project that aims to achieve net negative emissions across our entire operation. Our ultimate objective is the creation of an all-encompassing ecosystem and marketplace that effectively captures and trades carbon credits in an accredited, efficient and transparent manner, utilizing the power of the GreenCoin and the blockchain network.

Although these goals are partly addressed by some renewable energy credits /carbon offset credits/ emission trading systems (ETS), the corresponding accounting and management systems still have significant flaws that raise costs and hinder the monetization of carbon capture & clean energy assets, in addition limiting access to SMEs and individuals.

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BACKGROUND

What are the current problems in the Carbon market?

Carbon Capture cannot be effectively circulated based on Current Architecture.

At present, climate-conscious individuals are unable to successfully pursue carbon credit acquisition, reduce their carbon footprint, or achieve net negative emissions through the limited and inadequate carbon reduction options presently available in the market. Without a foundation of trust, the goal of carbon credit circulation is rendered unattainable.

1. Limited offering of carbon credits as a tradable asset class for retail investors - VCM's aren't directly accessible to an average individual

2. Lack of a harmonized incentive strategy for SME/Individuals. Although publicly listed large scale conglomerates undergo carbon emission taxes and penalization fines, there is a huge lack of incentive across the markets to report and assess the pollution conducted by majority of small players

3. Mismatched mediums of exchange over FX fluctuations in trading Carbon credits on traditional markets – Currency discrepancies that discourage global markets to proactively engage in carbon trading

4. Non-harmonized standards and ratings systems to address the carbon capture process, due to its inherent capturing inaccuracies over variant cross border assessment protocols

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Current Problems in the Carbon Markets

Who Decides the Value?

Variations in the development methodologies and computation standards of carbon credits across different regions have resulted in less credibility and less conformity of carbon-related data. This poses complex technical challenges in the assessment of their value.

How is the transaction guaranteed?

Climate stakeholders procure carbon credits from carbon capture project developers, and non-duplicable carbon credits serve as the foundation for establishing trust with financial beneficiaries. Purchasing non-replicable credits from carbon capture project developers has been basis of building trust in climate action communities. SMEs + individuals struggle to identify opportunities in carbon + financial savings in settling their footprint, due to prevalent inefficiencies of double counting + high pricing.

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Additionality

The possibility that a credit purchased and retired doesn't result in the avoidance or sequestration of a tonne of CO2e that would not have occurred otherwise.

Over-crediting

The possibility that a given project would issue more credits than actual tonnes of CO2e due to components like irrational baseline assumptions.

Non-permanence

The possibility that the carbon avoided or removed by the project won't do so throughout the duration of the commitment, plus any informational risks.

Further problems in the current carbon market in relation to quality components of issued carbon credit also needs to be addressed!

Leakage

The chance that emissions a project avoids or removes are pushed outside its boundaries.

Illogical incentives

The chance that a project will reap rewards, such as offset profits, encouraging behavior that lowers efficacy.

Policy implementation

The danger that the project's ability to reduce carbon emissions will be compromised by the political climate.

CARBON EMISSIONS

What are the current market initiatives?

Contemporary ESG initiatives to fight carbon emissions

In a 1997 accord known as the Kyoto Protocol, the Intergovernmental Panel on Climate Change (IPCC) created a carbon credit plan to lower global carbon emissions. The agreement established legally binding emission reduction targets for the signatory nations.

Countries were categorized between industrialized and developing economies under the Kyoto Protocol. Through an Emissions Reduction Purchase Agreement, a nation that exceeded its hydrocarbon emission target might sell its excess credits to nations that fell short of their Kyoto- level targets (ERPA).

CERCs, or Certified Emission Reductions, are carbon credits that were given to developing countries supporting sustainable development programs under the Clean Development Mechanism (CDM). These credits were traded on the International Transaction Log (ITL) which tracks transfers and acquisitions of units under Kyoto protocol and other COP/CMP decisions

Paris Agreement goals

- Global emissions reduced by at least 15 billion tons per year.
- Many governments around the world raised the emissions cost through carbon price and compliance management. The 25 operational ETSs as of the start of 2022 cover 17% of global GHG emissions and are implemented in jurisdictions representing 55% of global GDPA
- Planetary plan of $100 trillion created by at least $3.5 trillion annual investment.
- At COP27, after 27 heated meetings, a loss and damage fund were agreed for the first time by 190 attending countries. $230 million was pledged in helping vulnerable communities find solutions for climate change. First meeting for operationalizing funds will conclude in March 2023 in light of COP 28.

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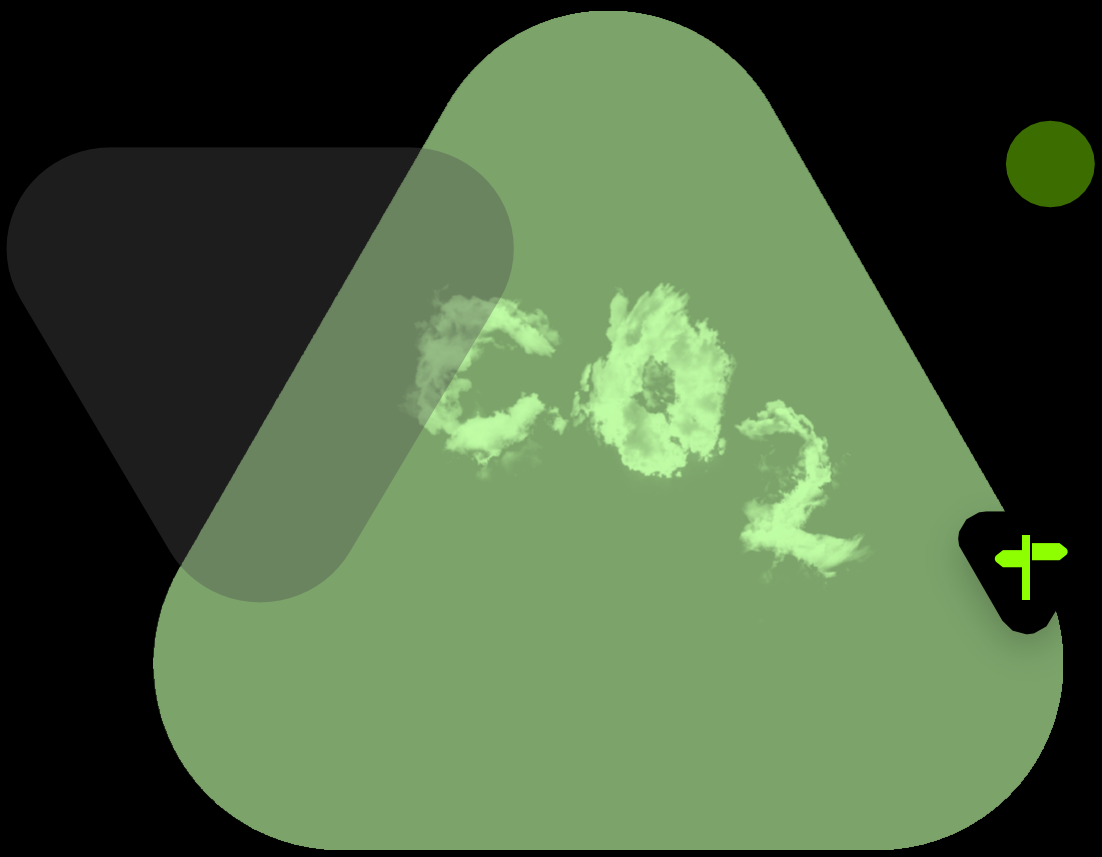
Carbon Neutral by 2050?

1. The agreement aims to achieve carbon neutrality somewhere between 2050 and 2100.
2. This entails a commitment to keeping greenhouse gas emissions from human activity to a level that trees, soil, and oceans can naturally absorb.
3. In order to attain this aim, according to scientists, greenhouse gas emissions must be eliminated worldwide within the next 50 years in addition to practicing low carbon behavior.



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CARBON EMISSIONS

GreenCoin prioritized agenda in addressing the Global Net Zero Challenge

The GreenCoin project intends to contribute towards the alignment of roadmaps/ targets in a transparent and efficient manner specifically for **individuals & SMEs**. The purpose is also to provide an opportunity for countries and multinational entities in utilizing their capex to innovate and decarbonize; where carbon can be treated as an exchange of value for reducing carbon content.

What is the difference between Zero Carbon and Net zero?

Net-zero refers to achieving an overall balance between emissions produced and emissions taken out of the atmosphere.

The term **'Carbon-Neutral'** refers to balancing out the overall quantity of carbon emissions. For instance, a business Could declare its energy to be "zero carbon" if its building runs solely on solar power and consumes no fossil fuels.

Issues:

The metrics set to fairly assess and also hold the clients accountable in achieving said targets are vaguely described and international standards mandated by governments vary from country to country.

'Carbon Accountability' was only introduced in 2022 - where companies are encouraged to break out their capex, exposing where firms invest for decarbonization and disclose their bona fide carbon footprint and its decrease.

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CARBON EMISSIONS

Our Vision

Our vision is to bolster the accessibility of carbon capture/credits for consumers and promote the widespread adoption of blockchain technology to enhance carbon capture traceability, accountability, and verification; with the ultimate goal of creating a carbon-backed, blockchain based ecosystem.

By achieving these objectives, we aim to benefit both the present and future generations of the global community in combating climate change and promoting low-carbon behavior.

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How do we intend to do this?

By building a holistic Carbon Ecosystem for all environmentally conscientious communities

Why is Blockchain the best solution for a Carbon Emissions (capture | low carbon behavior) ecosystem to monitor, report and verify Carbon Credits, Assets and Data?

Criticism regarding the effectiveness and quality of the current supply of carbon credits is the dominating factor. Disparity between well-established ETS carbon credits and VCM market credits entail an inherent standardization issue.

The VCM, a decentralized market where private players trade carbon credits, has existed without a common denominator for quality or accounting standards since its genesis.

The market has become oversaturated with certifying options, making it difficult for buyers of carbon credits to distinguish between signal and noise. Similar lack of transparency has effects on the veracity of promises about benefits to the environment.

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What does GreenCoin offer in comparison to Incumbent Markets

ETS Market	ICM Market	VCM Market
• **Biggest player** in the market with requirements for major emitters to participate • **Highly regulated**, with strict reporting, monitoring, and verification requirements (MRV) • **Extremely liquid**, The WCI, RGGI, and EU ETS saw more than US$851 billion in trading in early 2022 • **Price range from 2018 – 2023** 16.37, 24.51, 18.54, 49.78, 86.53, 97.91 US$/tCO2e	• The Kyoto Protocol's **first significant worldwide market for the CDM,** transferred emission reductions across nations • Accounting practices that are not recognized by governments, including Gold Standard (GS) accounting • **Moderate liquidity;** since 2006, US$14 billion has been exchanged annually on average • **Price ranges** between US$0.2 and US$0.4/tCO2e	• **Independent markets** to encourage voluntary carbon reductions from unregulated enterprises • Used primarily for corporate social responsibility (CSR) initiatives • Little to no regulation, various degrees of rigor in accounting procedures • **Limited liquidity**; however global traded value amounted to nearly US$ 2 billion in 2022 • **Price ranges** between US$0.1 to US$70/tCO2e*

Above mentioned markets facilitate 'Carbon Offsetting' by way of Emissions Trading.

GreenCoin initiative aspires to be a pioneer of the industry by prioritizing 'Carbon Capture', addressing issues of:

1. Carbon Credit Regulation
2. Carbon Capture Standardization
3. Market Liquidity
4. Price Volatility

Blockchain enabled GreenCoin with its distributed ledger and smart contracts offer:

- Transparency
- Swift Financial Access
- Interoperability
- Equity
- Convenient Market Access

Core Issues	GreenCoin Blockchain Solution	Relevance to Carbon Market
Lacking the transparency in credit supply	Public ledger tracking & record keeping on carbon credit data, time stamps, attributes in a systematic order of origin	The **public record feature** of blockchain can demonstrate the variety of credit supply, including established, specialized, and novel project types and approaches.
Vague economy and data around carbon credits	Recording of Carbon Assets and Carbon Data distinctively between projects	The **traceability function** of blockchain can confirm the origin of carbon credits and offer a tamper-proof trail of activity along the whole value chain.
Measurement, Reporting & and Verification (MRV) technologies lacking full integration	Smart contracts that structure data from diverse sources and transactions, facilitating exchange of tokens and data across multiple blockchain networks	By enabling data sharing across various technologies, data formats, and model types, **blockchain connectivity** can enhance coordination among VCM participants.
Limited access to capital due to trust issues	Give access to markets in identifying the supply pipeline in distinguishing the quality and credibility of credits	The market can send strong demand signals for high-quality credits to increase the issuance of reliable projects by using blockchain's **transparency feature**.
Costly verification on carbon credits and origination	Validation of operational procedures and verification of data electronically	The **self-executing aspect** of blockchain can simplify and streamline the registration procedure and increase project's' access to markets.
Variable payment solutions diminishing transparency for VCM communities	Smart contract verification of contractual terms enabling the automatic transfer of payments on execution	Blockchain's **settlements function** can streamline payments and increase transparency over how money gets to local recipients.
Lack of incentive to participate in Carbon Capture activities	As a utility token, GCT, aims to provide retail investors to participate in investment grade digital assets while contributing to carbon capture	Carbon capture has been mostly a 'defensive' game where threat from regulators or negative media coverage moved actors into this space. By approaching the matter from the other direction, i.e., incentivize carbon capture and by making the process liquid should increase participation from a wider range of participants.

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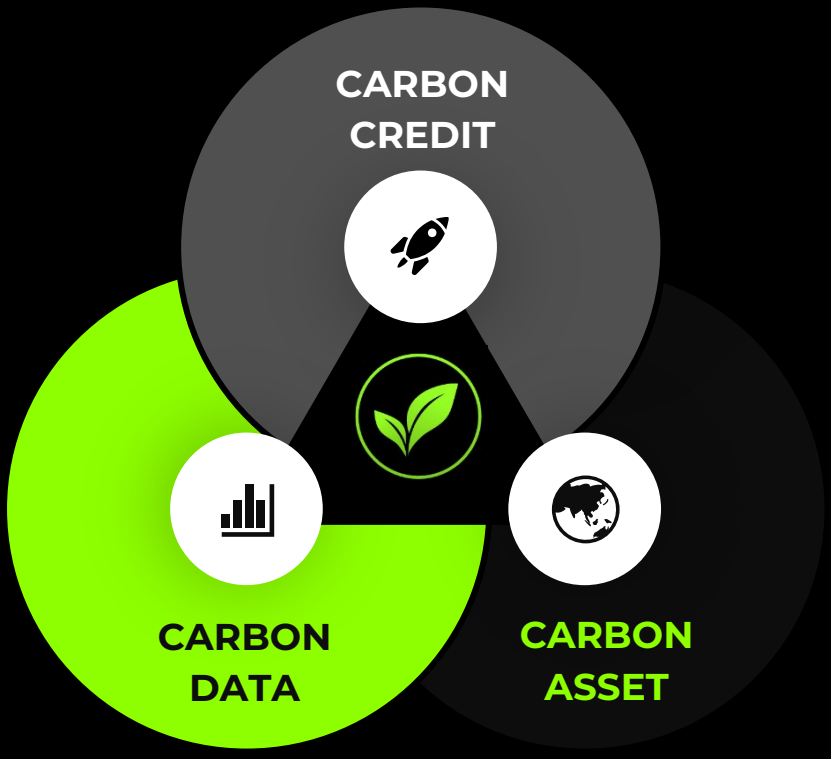
Proposed Streamlined Blockchain Architecture in addressing the above issues



- Active Carbon Removal, Registration & Standardization
- Low carbon Behavioral Play to X Gamification
- Carbon Exchange (Trading Platform)
- Carbon Ratings Solution

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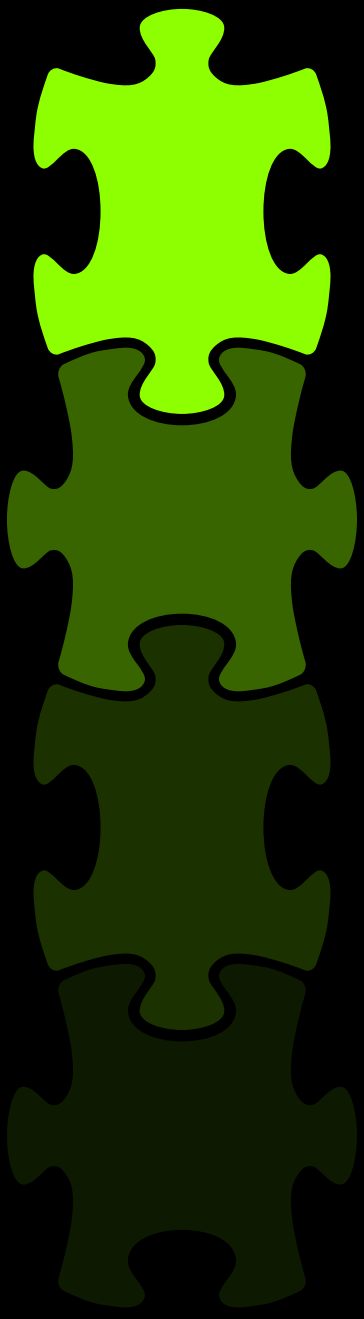
How does Blockchain impact Carbon Capture?



Carbon Capture Registration (SMEs and individuals)

Those looking to reduce their emissions will have access to a transparently priced, highly liquid carbon market unlike any that currently exists by shifting the voluntary carbon market to a blockchain and publicly connecting each credit to metadata attesting to its quality and provenance. Also solves the problem of cross-border FX losses that may incur as it would be carried out for cheaper on a blockchain network.

Play to X Scheme

GreenCoin initiative allows for users to register multitude of low carbon behavioral patterns and data on the platform and convert behavioral data points into tokens.

Carbon Tokenaization

Anyone with a cryptocurrency wallet can buy / sell carbon credits/ ESG related tokenized assets. Therefore, liquidity in the market is expanded for large corporations by providing a wide array of financial instruments that incumbent architecture cannot provide. Additionally, tokenization adds efficiency and transparency to the carbon market that weren't previously present.

Carbon Ratings & Standards

Ratings provided on the network would be immutable and hence provides authenticity across quality of data on emitting companies. Ratings would be visible to the public on the distributed ledger ensuring full transparency Standards framework on the blockchain coupled with collected data of carbon emitting players ensure the historical storage of information and continuity. This enables the facilitation of Decentralization that is non-existent in incumbent industries.

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How does GreenCoin impact Carbon Capture?

Carbon Capture Registration (SMEs and individuals)

- The SMEs that lack funding and resources for climate action have a cost- effective solution with GC – The project will provide a uniform registration system in accordance with the standards and ratings set by the initiative.
- The fundamental aspects of carbon credits (Additionality, Overestimation, Permanence, Exclusivity, Leakage, Social & environmental harm) will be more scrutinized with GC
- Carbon capture registration with incumbent carbon trading platforms would be more time consuming
- USE CASE 1 of GC – Utility creation for conversion of carbon credits to a tradeable asset using GC. This enables the buy/sell/transfer of credits using our token.

Carbon Exchange (trading platform)

- We intend to integrate with market players on our platform to house all global carbon buyers and sellers under one roof
- GreenCoin exchange, alongside its NFTs provide more liquidity and accessibility into a decentralized carbon ecosystem
- USE CASE 3 of GC – GC will be paired with other cryptocurrencies at the spot rate of carbon enabling participants to liquidate their tokens in other exchanges.

Carbon Asset Tokenization

- USE CASE 2 of GC- will provide players in the ESG sector that have procured carbon capture PPE to tokenize their physical assets ranging from Amine solvent-based capture plants, CO2 capture rotating packed beds, Molten Carbonate Fuel Cells, Biodiesel engine generators, CHP Biomass Gasifiers, gas turbines etc.
- GC will facilitate value transfer for the ESG players wanting to sell their equipment by a tokenized asset, more conveniently and efficiently.

Carbon Ratings & Standards

- The main objective of the GC initiative here is to address all quality issues of carbon credits to ensure we set high thresholds for onboarding on our platform.

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How is Global Carbon Capture & Offsetting Impacted?

Carbon Capture Registration (SMEs and individuals)

- Encourage carbon capture globally, by enabling an efficient and easily accessible solution
- The corporate push for net-zero has increased public awareness of Carbon Capture.
- Strong green policies should be used in conjunction with voluntary corporate activity since VCMs are aiming for a decentralized and collaborative approach to correcting the flaws and inefficiencies in the current state of voluntary markets.
- The GC Initiative intends to collaborate with governments in promoting the same innovations that VCMs are investing in by catalyzing their adoption.

Reducing Carbon Emissions: GC Play to X:

- Incentivize low carbon behavior, in stage 1 our app will be tracking low carbon behavior over certain areas. This will include driving an electric car, installing solar panels, heat pumps etc. and cycling. Users will be able to monetize their low or zero carbon behavior by exchanging their rewarded GC on our exchange.

Carbon Asset Tokenisation

- Enabling the swift movement and procurement/sale of ESG related assets on a widescale carbon exchange that allows for the expansion of Carbon related projects globally.
- For carbon markets, which have historically been highly illiquid, blockchains aid in generating significant liquidity. Coupled with tokenization, the project will be able to pool or group carbon

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credits with related characteristics, increasing liquidity and letting the market determine the asset's fair market value on the exchange.
- When combined with smart contracts, digital MRV systems, and solid governance, tokenization can boost access to carbon markets, improve transaction records, and assist close the trust gap between people making an impact and those looking to support, sponsor, or fund it.
- These factors open up a gap in the market for carbon capture investment, PPE etc.

Carbon Exchange (trading platform)

- Enabling more accessibility for Carbon trading whilst increasing market capitalization of the entire industry.
- Promoting Climate Capitalism – To consider carbon as an asset class that can be monetized healthily.
- Provide an alternative to big businesses and nations to find a decentralized solution in meeting their allocated carbon liabilities.

Carbon Ratings & Standards

- Change the landscape of current carbon capture and offsetting frameworks and standards by setting strict thresholds in attesting for the quality of carbon credits.
- Building thorough audit trails can serve as the foundation for further calculations, methodologies, and products, such as automated emissions reporting, proof of compliance, insurance, and verified carbon credits, as well as being monitored to make sure that processes go as planned (or alerting important stakeholders to any exceptions).
- Accumulation of a Global Carbon Database that would catalyze further carbon related projects with the availability of historical information/benchmarks/ratings that players could derive inferences from.
- Become immediate climate actors pledging towards net negative reductions globally, and be recognized as **global ambassadors** in proactively making the environment greener.

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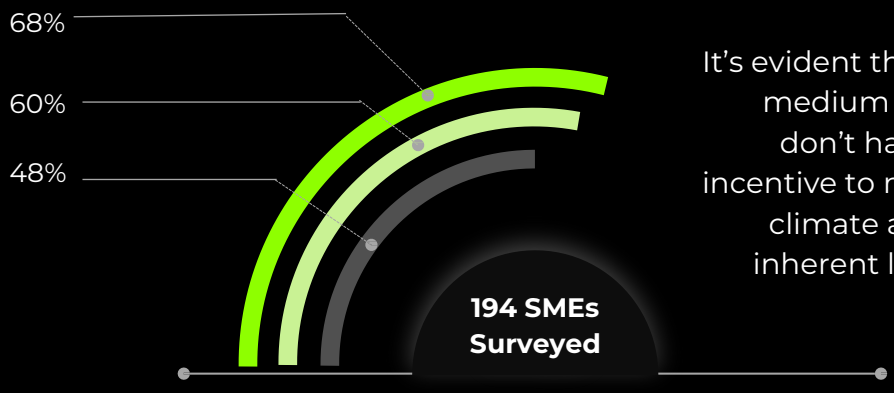
Greencoin Carbon Capture Registration

68%
Said lack of resources prevented them from taking climate action

60%
Of surveyed businesses had a climate reduction plan in place

48%
Said lack of funding prevented them from taking climate action

Why we target SMEs for Carbon Capture registration?



It's evident that the small and medium scale businesses don't have enough of an incentive to move ahead with climate action due to the inherent lack of resources.

Also, considering the EU ETS and available carbon credit market charge premium rates for credit, it's evident that there is a gap in the market for a cheaper solution that is more transparent as well.

Hence, the carbon capture registration would enable them to go ahead with GreenCoin.

This will enable SMEs to register credit buffers they accumulate over a given financial period.

Also, it gives access to the participants to freely trade the credits with GreenCoin on the platform

*The data is sourced from the website: https://smeclimatehub.org/sme-survey-barriers-to-climate- action/.

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Individual Low Carbon User"X to Earn" Scheme

GreenCoin initiative allows for the user to register a single or multitude of low carbon consumption behavioral patterns and data on the platform and convert the behavioral data points into the GreenCoin Token.

The individual low carbon consumption behavior is captured by the Hardware and software solution provided by GreenCoin

- Hardware – Mobile phone + IOT capture devices including smart watches, smart rings, solar panel records, electric car mileage data etc.
- Software – Bespoke blockchain solution to record low carbon behavior on-chain provided by GreenCoin Initiative

How we onboard users

GreenLabs will set up a unified standard by collaborating with various approved & verified carbon capture standards present in the industry

GCT/NFT will be offered on the trading exchange for users after applying these protocols

This whole protocol is considered the “X to Earn” scheme

GreenCoin initiative will facilitate trading of this token on our platform and other listed exchanges

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Small and Medium Enterprise Carbon Trading Market

- The main objective here is to establish a market encompassing various carbon credits across various jurisdictions that meets the set thresholds for the quality of carbon credits traded.
- The target market set at the onset of the project are retail investors + small and medium scaled enterprises.
- Blockchain solution provided by the GreenCoin initiative becomes pivotal in achieving immutability, transparency, and credibility.
- The goal is to exponentially enhance the liquidity of carbon credits across the industry.

Carbon Credit Supplying SMEs

Entities that can supply carbon credits during a financial quarter/ set period are able to register their credits on the GC platform.
They are directly able to convert their credits into the GCT/NFT conforming to the standards set for the credit quality.
Once the credits have been assessed and verified, the set GCT/ NFT could be traded on the exchange.

Carbon Credit purchasing SMEs

Companies that are likely to exceed their set quotas of carbon emissions for a set financial quarter/ period could directly access the GC trading exchange in purchasing credits.

The corresponding number of credits required will be issued in the form of GCT/ NFT.

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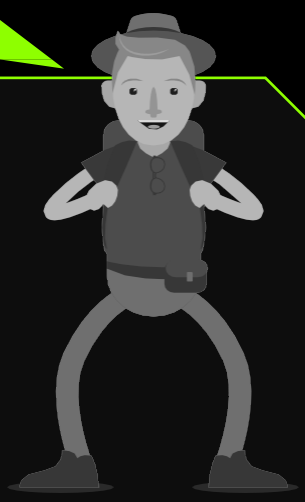
GreenCoin Carbon Asset Tokenization

GreenCoin initiative rewards sizable individuals & entities globally for their efforts to plant trees and invest in carbon capturing PPE, ensuring compliance with strict verification standards. These actions earn entities asset-backed tokens, thereby promoting reduction in GHG emissions whilst supporting financial well-being.

The initiative will participate in tree plantation scheme set to kickstart the project and further enable participants to capture carbon on the blockchain network via several alternative solutions. In addition to promoting play to X initiative, where entities are rewarded for their low carbon behavior.

The platform in essence would act as an intermediary in trading selected tokenized/ collateralized assets that are carbon capture related.

What is the procedure in achieving this? Trade it by:



Standardizing Carbon trade units in achieving climate-friendly products accessible across all industries through the blockchain.

Digital records of GHG emissions will be represented by a standard in order for GHG attributes to be traded =carbon embodied in one unit.

Every certificate ought to include a distinctive identifier (a DID) that serves as the token (or digital doppelganger) that will be connected to a certain batch of goods, business, and location with existing carbon accounting rules, with sector-specific advice.

There are many token standards that can represent individual GHG emission units, or a more comprehensive collection of data acquired throughout a supply chain. However, GC initiative's intention is to standardize this!

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GreenCoin Carbon Asset Tokenization

Carbon capture produces "savings" in Co2 reduction through actions like tree-planting. The carbon market is then created trading carbon credits the 'GCT'," and these savings are subsequently sold to customers. The usage of blockchain allows for the deployment of GC tokens, which serve as a representation of the carbon credit, to users' blockchain accounts (wallets).

·The traditional system transition of carbon trading is suggested below:

The creation and storage of carbon capture data, as well as the administration of carbon accounts, are primarily handled through the registration system.

The carbon management system completes both the accounting of third parties and the calculation of its own carbon capture

A market is subsequently created when GC Tokens are sold to other users. Each token's worth is based on the quality of asset, such as how much emissions are captured. Every token transaction may be processed transparently and stored safely using blockchain technology. Additionally, the token can be followed from seller to buyer with a variety of data on the underlying asset (emissions, geolocation, legal status, or linked environmental and social performance) - and also updated with the transition status of the GC token.

The management system, registration system, and trading system can all be loaded into shared account books using blockchain technology in the order in which they occurred. Changes brought on by searches, calls, and even system modifications will also appear in the same total books, allowing for a seamless connection between private and public platforms while also significantly reducing maintenance costs.

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GreenCoin Carbon Credit Exchange

In addition to the previously mentioned data openness and non-tampering, the blockchain's features also include the crucial aspect of decentralization. The same protocol will be followed by all enterprise nodes, and it will require that all carbon transactions adhere to the same consensus algorithm in order to ensure consistency across all workflows. This will considerably liberate the incumbent carbon emissions trading exchanges and bring about "decentralization".

GreenCoin will enable its users and other VCMs to participate on its centralized Carbon exchange.

Users will be able to register verified carbon captures into tradeable credits on the platform, and also engage with token/NFT transactions on other exchanges.

An automated market making mechanism will be realized to establish an open market trading price of credits.

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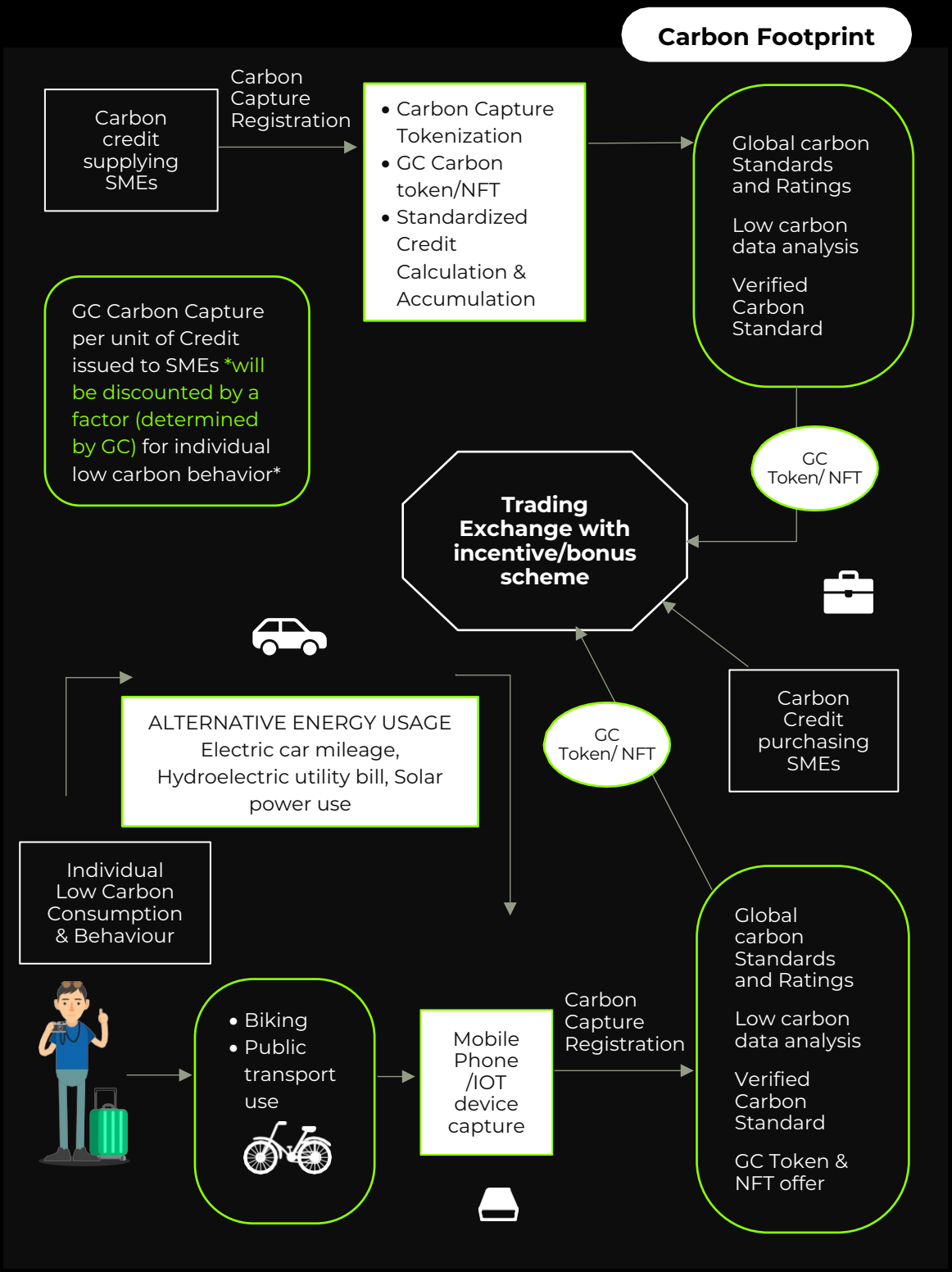
Workflows



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GreenCoin Carbon Ratings & Standards Framework

The main objective of the GC initiative here is to address all these aspects when assessing the quality of carbon credits to ensure we set high thresholds for onboarding on our platform.

- Entities, hence, will be able to make more informed purchasing decisions to reduce their footprint - Scope 1 & 2, emissions once they have these emission totals in hand. Data becomes a tradeable asset henceforth.
- We intend to implement primary data sharing at the product level, and our aim is to incorporate better instructions and resources with already implemented solutions.

Issues with carbon capture data

Current emissions accounting techniques don't produce data that can be used to inform purchasing decisions that reduce supply chain emissions. The Corporate Value Chain (Scope 3) Standard of the GHG Protocol, according to the GHG Protocol, "is not meant to facilitate comparisons between corporations based on their scope 1 & 2 emissions."

Carbon captured and stored since 1996 is significant however, has been overestimated by 19-30% overall. Zhang, Y., Jackson, C. and Krevor, S. (2022). An Estimate of the Amount of Geological CO2 Storage over the Period of 1996–2020. Environmental Science & Technology Letters, 9(8), pp.693–698.

Greenwashing:

When businesses make inflated or false environmental claims about their products or attempts to lessen their carbon footprint, this practice is known as "greenwashing."

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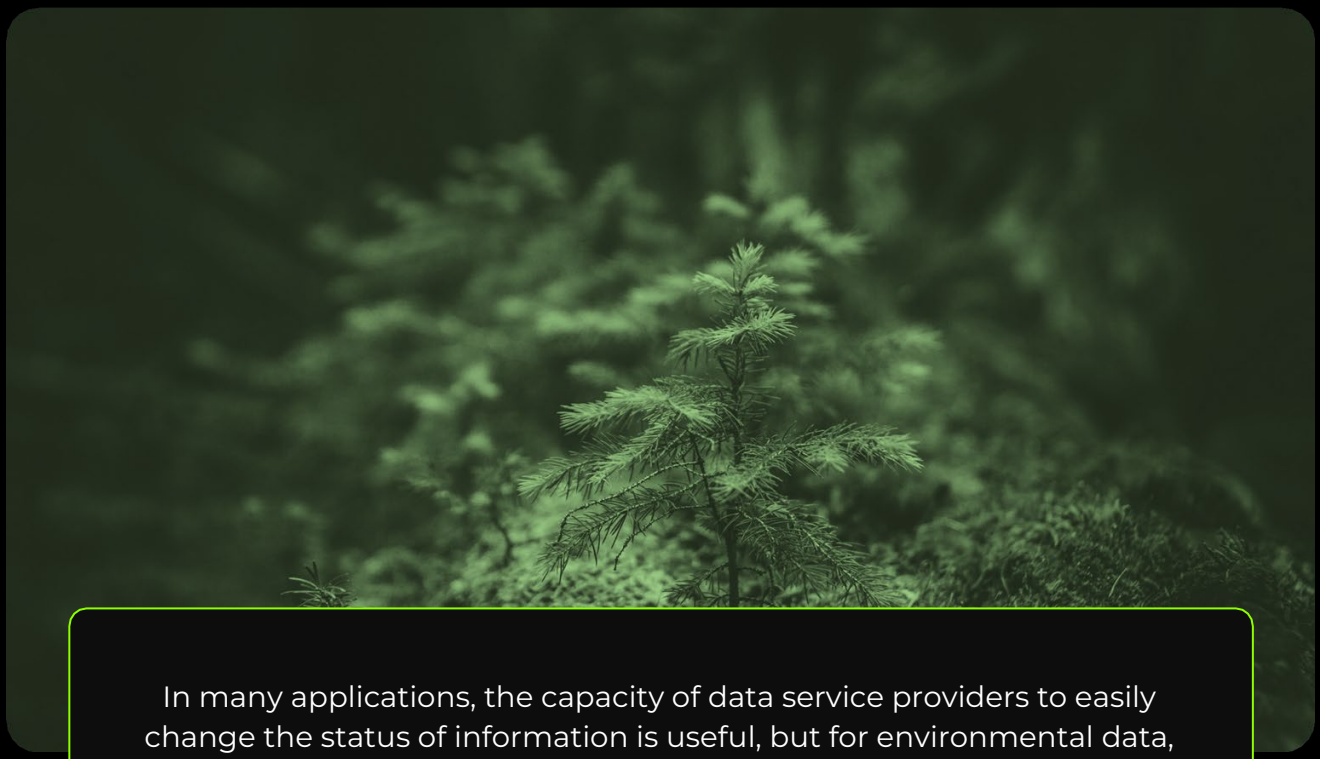
TECH STRUCTURE

Carbon Data Identification



In many applications, the capacity of data service providers to easily change the status of information is useful, but for environmental data, we must precisely know when, where, how, and by whom emissions are produced.

Climate actors now have a mechanism to continuously check the accuracy of data by using content addressing, a process made easier by cryptographic hashing for identifying and retrieving data.

A content identifier, or CID, is one type of content addressing that could be applied to this system. A content identifier constructs an address based on the content itself but does not specify where the material is kept.

CIDs act as digital fingerprints for data in this way. Supply chain participants could refer to the emissions information or GHG properties of a particular good, process, or activity within a supply chain using such a fingerprint as a distinctive and brief term.

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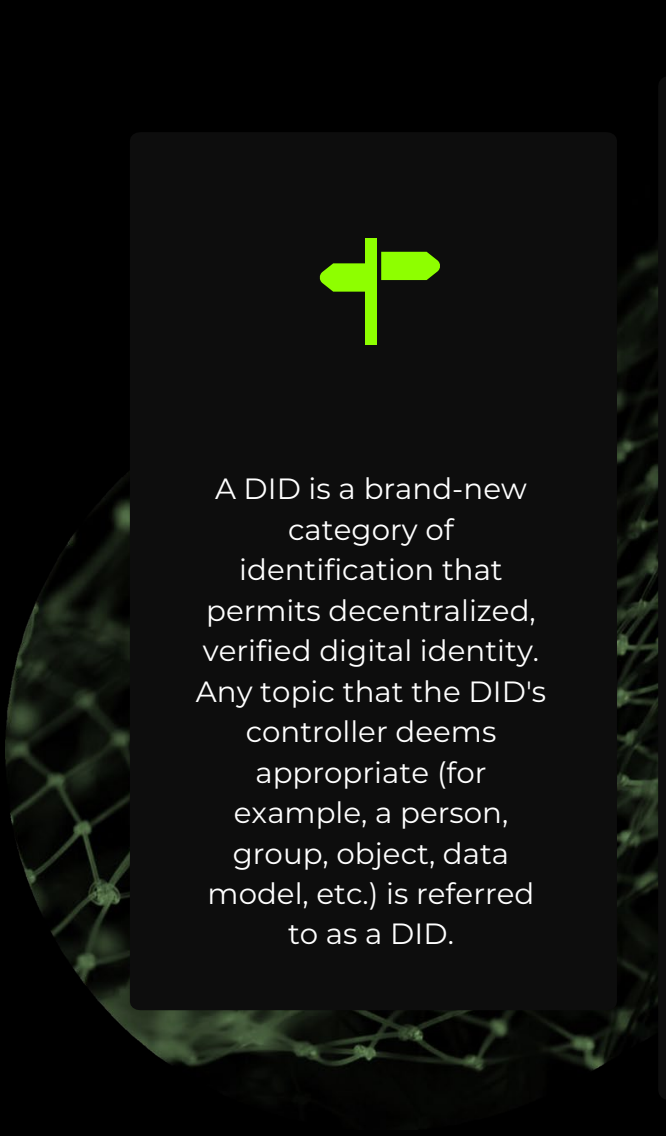
Carbon Data Ownership

An encrypted transport layer for peer-to-peer communication- DIDs + VCs - for authentication, will allow climate actors and devices to directly exchange data in a confidential manner.

These elements allow us to send information in a "trustless" manner, which reduces the need to rely on third parties and instead makes it possible to verify the accuracy of the information and ownership.



A DID is a brand-new category of identification that permits decentralized, verified digital identity. Any topic that the DID's controller deems appropriate (for example, a person, group, object, data model, etc.) is referred to as a DID.

Verifiable Credentials - "reflect assertions made by an issuer – respecting privacy". To protect privacy, VCs enable digital watermarking of claims data using public key cryptography and other methods. This has the consequence of allowing physical credentials to be securely converted to digital credentials, as well as allowing holders of such credentials to selectively divulge information from such credentials without disclosing the actual data.

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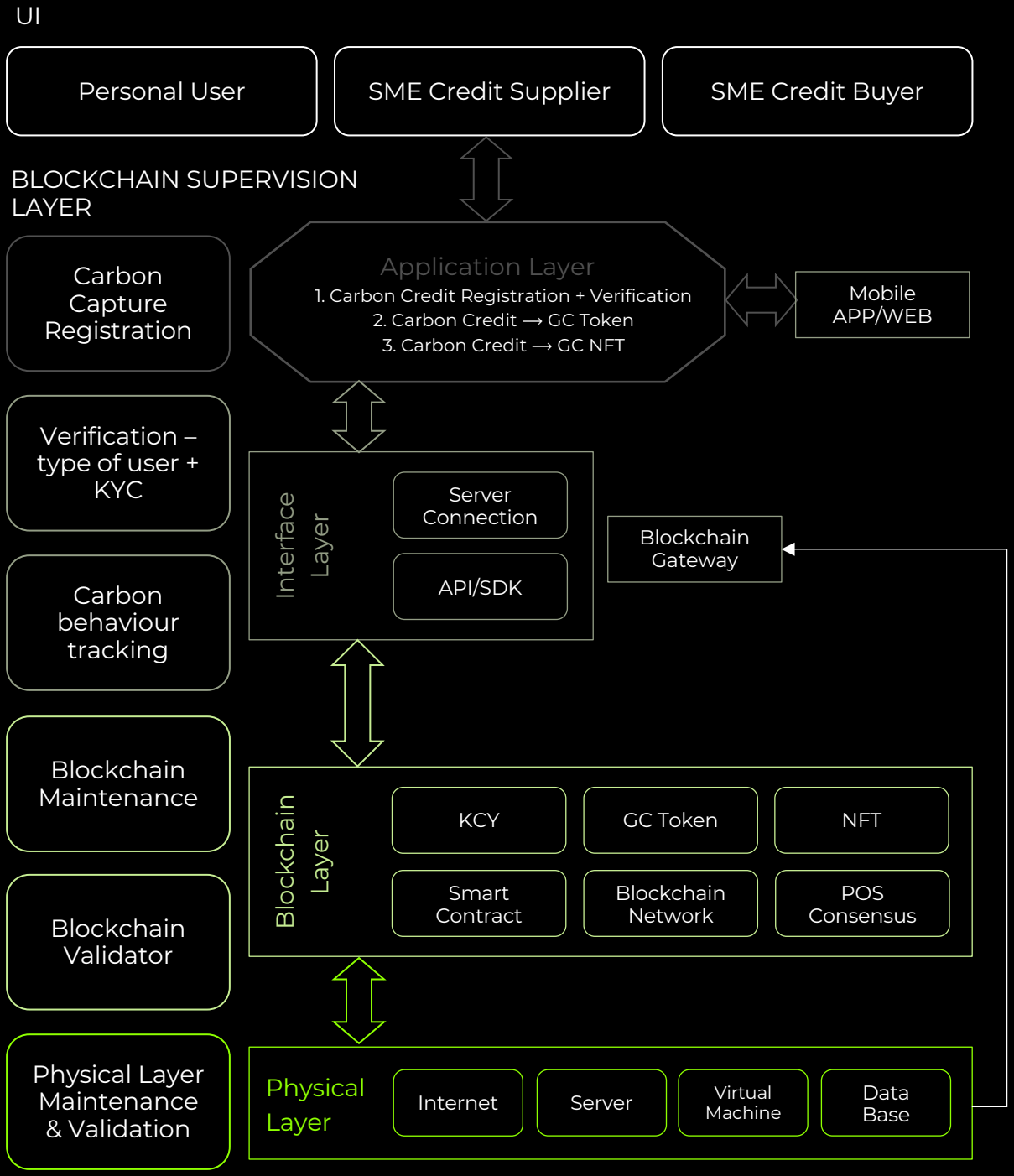
TECH STRUCTURE

UI, Blockchain And Technical Architecture For Greencoin Initiative



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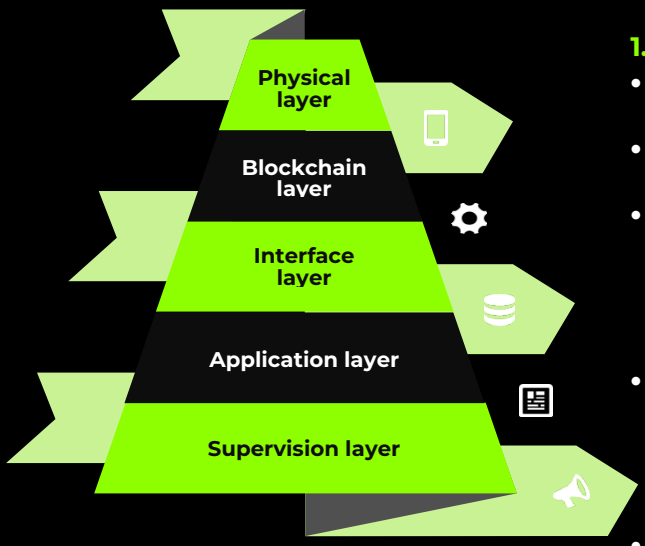
TECH STRUCTURE

Technical Architecture



1. Physical layer

- This layer provides the underlying infrastructure for the blockchain solution to run smoothly.
- Components -server network, internet, storage, and virtual machine.
- The foundational network information services mainly ensure reliable operation of upper-layer services establishing stability and failsafe network solution to ensure the non-disruption of blockchain services provided by GreenCoin.
- The database specified here in the base layer will be run on a decentralized filesharing service –File Coin. This is to fully utilize the safety of blockchain data security and immutability in conducting GreenCoin big data analysis.
- Client Classification and verification using AI to improve GreenCoin service efficiency would be handled at the base layer database that we would create at this stage.

2. Blockchain layer

- This layer is the integral core of GreenCoin Blockchain solution that will ensure the credibility, transparency and reliability of the entire carbon capturing process.
- The consensus protocols for the GreenCoin Token exchange are also embedded in this layer.
- The consensus mechanism + P2P network transmission guarantee the security and distributed consistency of the network, and hence is pivotal for the entire product.
- This layer handles only the transactions + Tokenization. It provides Security +Scalability + Decentralizationfor all its operations. However, data relating to the tokens and transactions are stored in the Physical layer.

3. Interface layer

- The interface layer is utilized to capture the functional modules and provide a simple ‘calling method’ for the Application layer.
- It is the Bridging layer that connects the application layer to the rest of the ecosystem.
- The application layer communicates with other nodes by calling the RPC interface. It also accesses and records local ledger data by calling the SDK toolkit.
- Client data is processed and stored utilizing the blockchain gateway in this layer.

4. Application layer

- Application layer connects the clients with the holistic blockchain solution using the GreenCoin User Interface.
- It will execute the rules set by GreenCoin in assessing and converting credible client data for the issuance of GCT/NFT.
- Once carbon credit is converted based on credible data, the ‘Individual low carbon user's’ carbon rights, and incentives + SMEs GCT/ NFT certificate are entered on-chain through smart contract Security +Scalability + Decentralization for all its operations. However, data relating to the tokens and transactions are stored in the Physical layer.

5. Supervision layer

- The supervision layer involves the top- down network management, monitoring and related certification, authentication, and authorization of the overall blockchain architecture.
- Validators participate in the blockchain infrastructure as blockchain nodes to conduct compliance reviews of transaction data.
- These nodes will be assessed and assigned by GreenCoin utilizing the proof-of stake protocol.

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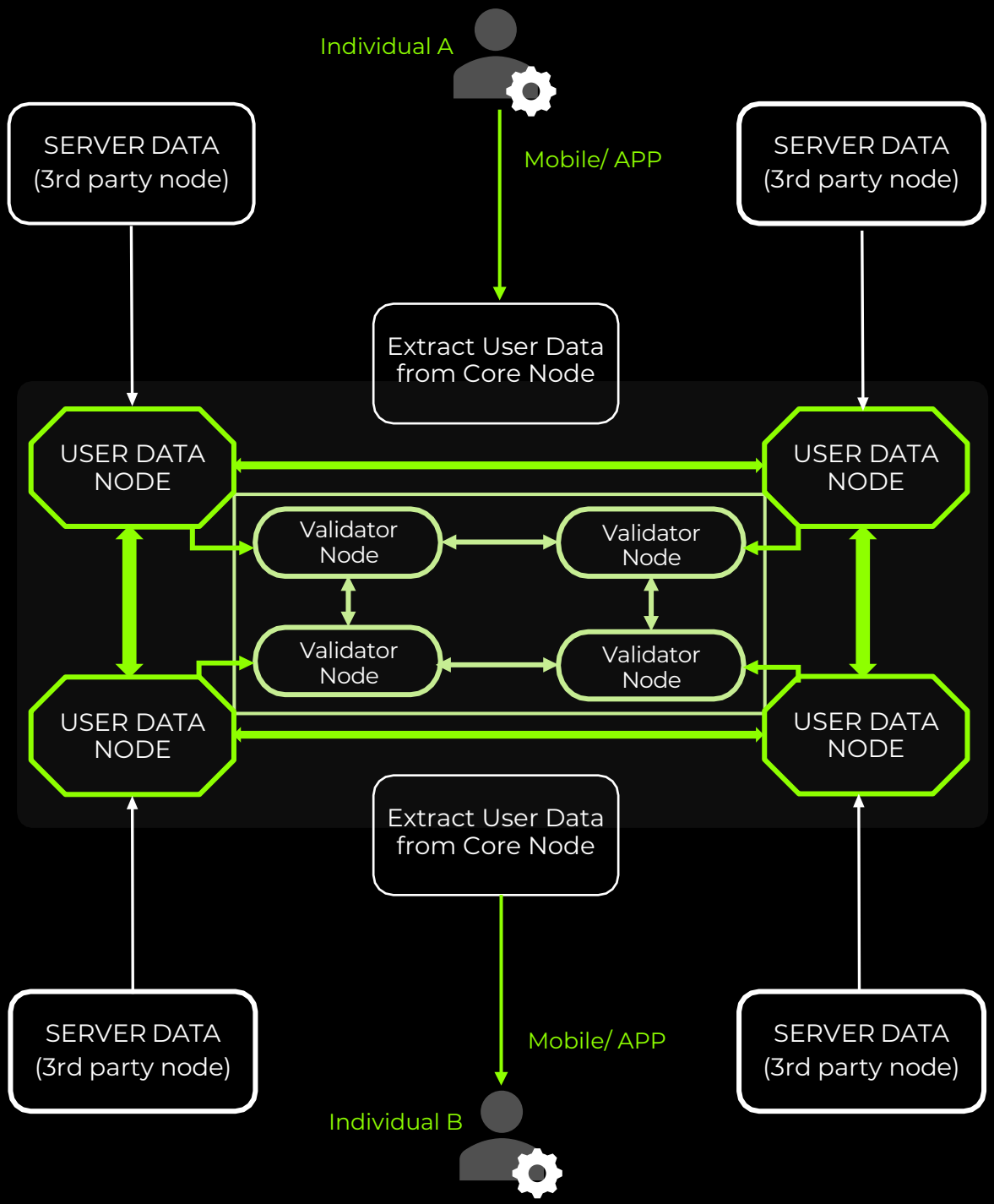
TECH STRUCTURE

Understanding the distributed storage network of the Supervision Layer



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Understanding the distributed storage network of the Supervision Layer

The distributed storage network of the blockchain is mainly divided into Core nodes (validator), User nodes, and Third-party nodes.

Core Node

1. Responsible for maintaining and recording data on the entire blockchain network.
2. It is denoted by the 'Validators' in the figure who verify data in processing transactions and publishing in the distributed ledger.

User Node

1. Responsible for accelerating the user's reading of block data, and time caching data blocks of nearby users according to the platform strategy in speeding up user's reading and writing of files.
2. When the user does not use certain files for a long time, these files will be transferred from the core node to third-party nodes in reducing the pressure on the network.
3. When users need to interact with data, the generated data will be stored in the core node for the first time and cached on the core node.

Third-party Node

1. When the data is not used within a certain period, it will be stored in the Third-party node.
2. During the storage process, data of the core node will not exceed set threshold. Once it exceeds a certain threshold, the oldest data will be stored in the third-party node according to the principle of first expiration, even if the data has not expired.
3. In the process of cold storage (server data), the core node will record a third-party record of the user in the user data node.
4. Once it needs to respond, it will decode according to the record, and then return from the third-party node to the core data node for secondary cache.
5. The user data node divides data stored on the user terminal according to the platform strategy.
6. When the file size to be stored is too large, user terminal can transfer the file to multiple edge nodes at the same time in a concurrent transmission method to speed up the file upload speed.

The file blocks generated after splitting are transmitted to the user data node through asymmetric encryption, and then cached by the user data node to other nodes in the entire network according to the platform strategy.

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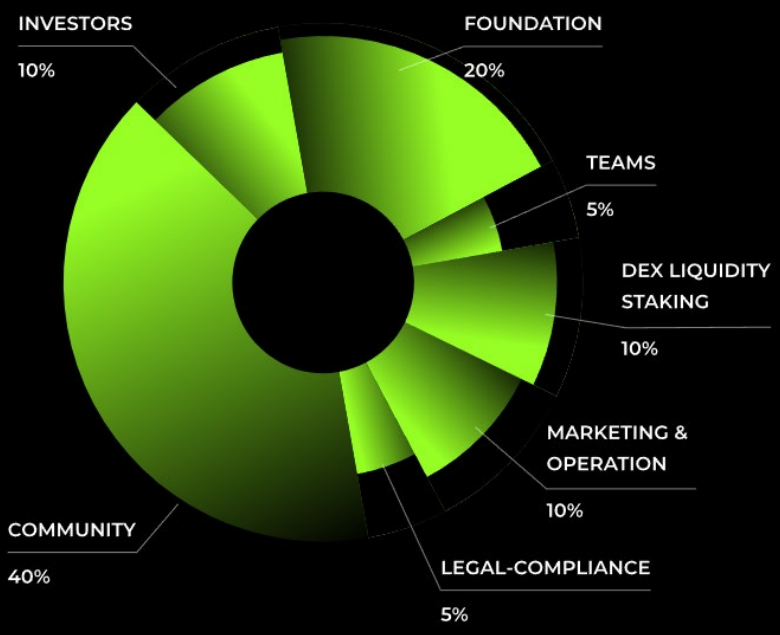
TOKENOMICS

GreenCoin Token Supply Allocation



Investors 10%
GC token equivalent of 10M will be allocated for the initial fundraising stage

Foundation 20%
GC's sustainable Carbon development allocated for core product research and development

Teams 5%
Allocation to support the team behind GC in the early stage; A delegated lock-in period of 3 years set.

DEX Liquidity Staking – 10%
GC Token staking allocation provided for decentralized exchanges

Marketing & Operation 10%
Token allocation for marketing, PR, community-building and carbon removal campaigns

Legal-compliance 5%
Utilized towards solicitor fees and legal administrative expenses

Community 40%
GreenCoin rewards for the community; mainly benefiting SMEs and project developers

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- Our dual-chain solution for GreenCoin deployment is executed through BEP 20 & ERC 20 networks in granting convenient gateways to the masses who have already onboarded on the selected chains.
- The selected chains not only enable maximum community outreach, but also ensure the most energy efficient & climate positive approach for our green solution for a brighter tomorrow!
- The GreenCoin utility token manages the Green Crypto Community in providing incentives, fundraising etc. in taking climate action to reduce carbon emissions. The low carbon behaviour capturing allows for the determination of the intrinsic value of the token

ERC 20

Utilizing the scalability of ERC 20 in ensuring that the carbon footprint is net negative, due to penetration of mass market audience with the established architecture

BEP 20

Approximating 6 million transactions daily on the network, it averages at 0.004 Wh of energy consumption per transaction. (Solana estimated at 0.17 Wh per transaction)

According to Gnosis/Energy Xdai's Consumption Statistics, BEP 20 network is superior to Visa credit card processing, which uses 1.78 Wh per transaction.

BINANCE

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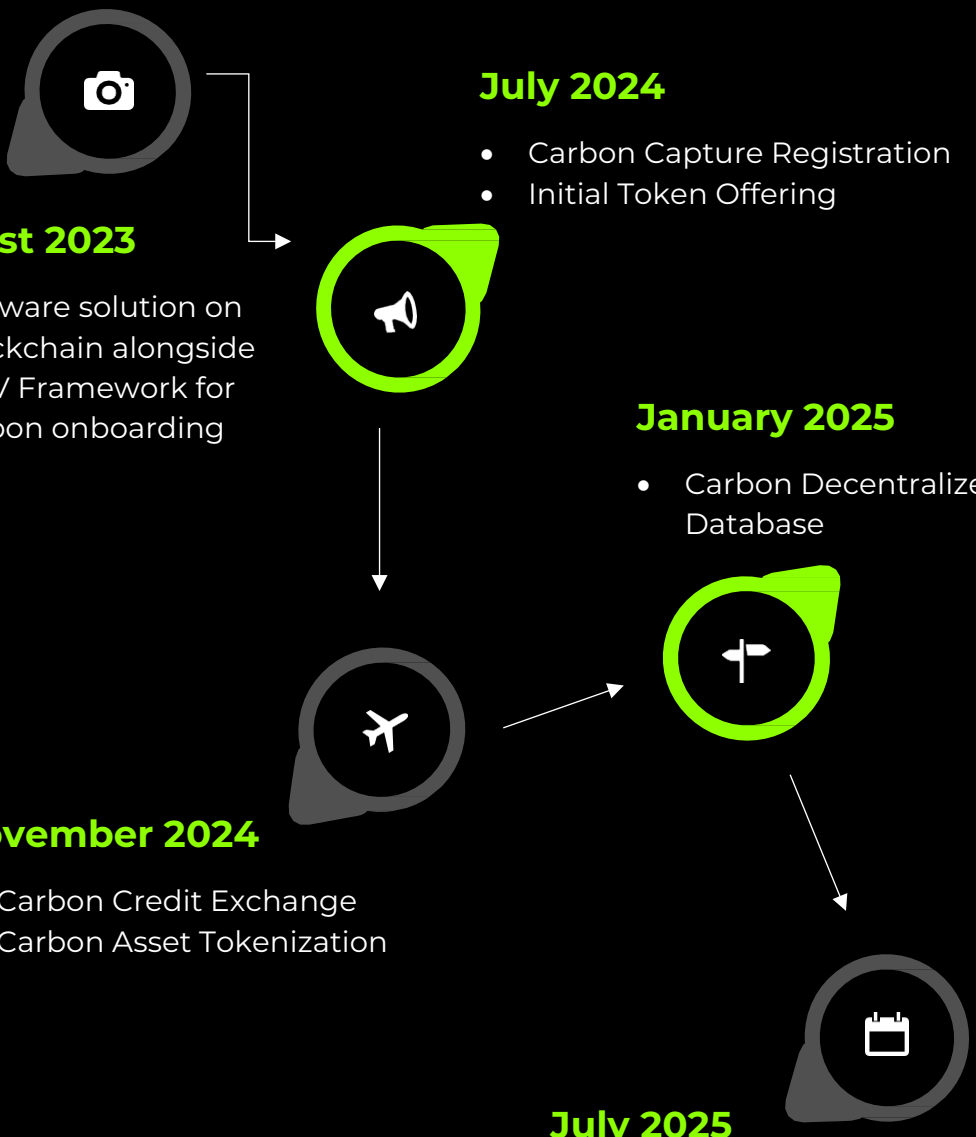
TIMELINE

GreenCoin Roadmap



August 2023

- Software solution on Blockchain alongside MRV Framework for carbon onboarding

July 2024

- Carbon Capture Registration
- Initial Token Offering

January 2025

- Carbon Decentralized Database

November 2024

- Carbon Credit Exchange
- Carbon Asset Tokenization

July 2025

- Setup of Ratings System

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