

Carbon
CharStore

White Paper Methodology

The CCS Carbon Platform

JULY 2022



The CCS Carbon Platform

Carbon Char Store has established the CCS Carbon Platform to promote the development of technologies that can remove CO₂ permanently from the atmosphere. This platform enables sellers of different methods of carbon removal to find buyers wanting to remove quantities of carbon corresponding to amounts of CO₂ they have emitted.

The Platform has been designed to host a range of carbon removal methods from different providers, including our parent company, Standard Gas Technologies Ltd.

Each removed kg of CO₂ is rated using an independently developed classification system that scores how long the carbon is removed for and with what level of certainty.

This information, along with supporting data is then represented as a non-fungible token (NFT) which serves as proof of the actual carbon removed. Each NFT is available on the Platform for conversion against the native currency.




CCC & carbon removal tokens

Carbon Char Coin (CCC) is the native currency used in the CCS Carbon Platform. Holders of CCC are guaranteed the ability to convert units of this coin for non-fungible tokens (which cannot be further traded or exchanged) as they become available.

This convertibility means each CCC can be thought of as a quantity of actual carbon already removed or to be removed in the future.

Purchasing CCC will enable both new and existing carbon removal technologies to develop and contribute directly to achieving the levels of carbon removal required to meet Net Zero targets and avert potentially catastrophic climate change.

CCC funds future carbon removal technologies and directly contributes to achieving Net Zero.

An aerial photograph of a dense forest with a dirt path winding through it. The trees are mostly green, with some showing yellow and orange hues, suggesting autumn. A large, semi-transparent green graphic element, resembling a stylized letter 'L' or a large arrow, is overlaid on the right side of the image. The text is centered in the upper half of the image.

“CHANGE IS NEVER EASY, AND IT OFTEN
CREATES DISCORD, BUT WHEN PEOPLE
COME TOGETHER FOR THE GOOD OF
HUMANITY AND THE EARTH, WE CAN
ACCOMPLISH GREAT THINGS.”

**DAVID SUZUKI, CANADIAN ACADEMIC,
SCIENCE BROADCASTER, AND ENVIRONMENTAL ACTIVIST.**



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Introduction:

This White Paper explains the background to the development and implementation of the CCC utility token by Carbon Char Store (CCS), a wholly owned subsidiary of Standard Gas Technologies Ltd (SGT).

SGT has developed and patented a carbon-negative advanced thermal cracking process – **SG100 technology** – that converts a wide range of highly biogenic and non-recyclable waste streams into two products: a clean, high-energy gas (syngas or biogas) and carbon char. The SG100's by-product char, which comes in different grades and composition depending on feedstock waste streams, is the medium for carbon capture and removal via sequestration, and the basis for CCC.

Through third party marketing and sales of CCC, CCS will make effective carbon removal available to companies, other organisations and individuals, enabling them to drive the changes needed to ensure the reversal of climate change.



The problem:

How to achieve Net Zero?

In 2015, 196 countries assembled at COP21 adopted the Paris Agreement, a legally binding international treaty on climate change, with the goal of limiting global warming to below 2°C, and preferably to 1.5°C. The overwhelming scientific consensus remains that failure to achieve this goal will result in irreversible ecological and economic damage to Planet Earth. The question is: how to limit this warming? The answer? By achieving Net Zero by 2050.

Net Zero is the goal of reducing greenhouse gas (GHG) emissions, which cause global warming, to zero by 2050. This means balancing the amount of GHGs released into the atmosphere by removing and permanently storing an equivalent mass.

Although GHGs comprise several gases – primarily CO₂, methane, nitrous oxide, water vapor and fluorinated gases – today the generally accepted shorthand “carbon” or “CO₂” is widely used when referring to them.

Despite the laudable aims of Net Zero, there is a further complication: As global economic development increases, carbon emissions are rising, not falling. Consequently, the United Nations’ Intergovernmental Panel on Climate Change (IPCC), representing 195 countries, firmly believes that if this trend is not reversed by 2030, it may be impossible to avoid catastrophic climate change and its consequences for life on Earth.

However, there are potential solutions if they are deployed rapidly and at scale. Carbon removal (CDR) processes can provide an important pathway towards Net Zero by cancelling out or, potentially, even exceeding increased GHG emissions. To be effective, CDRs must enable the capture and sequestration – or permanent storage – of carbon in the atmosphere generated by wide-ranging human activities, from industrial extraction and production, through agriculture and transportation, to energy-consuming everyday living.

By creating CCC, we will make CDR both available and in easy reach of organisations and individuals so that everyone can play a part in reversing climate change.



Achieving Net Zero:

From carbon offsets to carbon removal

Once the connection between carbon emissions and climate change was recognised, two initiatives developed to encourage emissions reduction in the form of carbon offset markets, one based in law and requiring compliance, the other voluntary.

Regulated by national, regional, or international carbon reduction regimes, compliance markets make carbon offsetting mandatory. Voluntary markets enable companies and individuals who wish to reduce their carbon emissions footprint to purchase carbon offsets even though they are not legally bound to do this.

Compliance-based carbon offsetting – commonly via emissions trading schemes (ETS) – predominantly works on a “cap and trade” basis. For example, companies will be set a limit or “cap” on the levels of carbon they can emit in a specific period, which will be steadily reduced over time. If a company exceeds its emissions cap, it must then compensate by offsetting the excess by buying credits from other emitters which have achieved an equivalent level of emissions below their cap.

Voluntary systems have also developed in which carbon emitters – organisations and individuals – make a choice to buy credits from one or more offset providers even though there is no legal requirement to do so.

While offsetting systems are designed to help reduce current and future carbon emissions, they do not prevent emissions or reduce the level of carbon in the atmosphere.

If we are to reach the goal of Net Zero, where global CO₂ concentrations are comparable to pre-industrial levels, then it is imperative that emissions are not only reduced but that historic emissions are also removed from the atmosphere. Moreover, in some cases it is more economical to remove CO₂ from the atmosphere than it is to stop emitting in the short run. For example, instead of phasing out gas-based electricity production before its planned lifetime, by removing CO₂ and continuing electricity generation with gas maintains energy security where renewables cannot yet provide the same reliability.

How carbon removals offer a pathway to Net Zero

This white paper describes how CCS is developing a voluntary system that will enable businesses and individuals to contribute to the removal of both their historic and ongoing carbon emissions by purchasing CCC and choosing to convert them to carbon removal NFT's on the CCS Platform.



Voluntary carbon offsetting: an anatomy

There are now a variety of carbon offset programs serving the voluntary market, which primarily comprises corporations wishing to evidence their corporate social and environmental responsibility through greenhouse gas emission reductions. Most of these programs reward offsetting efforts that reduce current emissions rather than preventing emissions or removing historic emissions. Predominantly, these offsets come through the issuance of Verified Emission Reduction (“VER”) credits.

Voluntary market oversight.

The primary motivation for obtaining VERs is to reduce carbon footprints to demonstrate corporate social responsibility, an increasingly important aspect of corporate governance, particularly in the developed world.

Considerations such as certification, reputation and environmental and social benefits are important, and companies and individuals can purchase carbon credits directly from projects, companies, carbon funds or brokers. However, all VERs must be verified by an independent third party and must be developed and calculated according to one of the existing VER standards.

The most common VERs in the voluntary carbon market are the Verified Carbon Standard (VCS), the Climate Action Reserve (CAR), the Gold Standard, and the American Carbon Registry (ACR).

In order to be certified under these schemes, a project or process must undergo a rigorous assessment under accepted carbon accounting methodologies. Most VERs seek auditing by recognised independent third parties and provide a registry which contains information on the generation, retirement and cancellation of certified projects.



The problem with VERs.

The certification process currently operating in the voluntary carbon offset market has many admirable features. For instance, it is vital that a project's claimed benefits are real, both in terms of carbon removal and storage, and this needs to be independently verified. It is also important that carbon removals are only "used" once and the scope for double counting is removed.

However, there are some problems with VER processes that hinder the ability to rapidly remove CO₂ from the atmosphere, and which CCC seeks to address. These are:

- Financial. The cost of achieving certification is often high, particularly for small projects.
- Timescale. The verification process is protracted.
- Flexibility. Only projects that "fit" into the certification process are successful.
- Binary outcome. A project is either certified or not, which leads to one CDR being considered the same as another.

In view of these issues, we believe a system that carries forward the positive features of emission reduction systems and improves on the certification, classification and verification of CO₂ removals, will ultimately lead to an acceleration of CDR projects and simplify the process of purchasing their removals. This white paper offers a route to achieve this by bringing clarity to the classification of available removals and simplicity of obtaining them via CCC – The currency of the CCS Carbon Platform.



The first step on this path is to change the way we look at certifying carbon removal.

What is needed is a system that is science based, clear to understand yet complex enough to capture the relevant differences between removal processes, and - most importantly - free at the point of use. We understand that to rapidly expand the scale of removals to reach Net Zero by 2050, it is essential to involve the very people who most want to bring reach that goal.

We aim to do that by classifying the quality, the mass and the method of any removals and recording that in an NFT. Only through open-source access to all the attributes of any removal can we build confidence in those removals. Accordingly, our classification is designed to both ensure a claimed removal possesses the necessary third-party checks for confidence in its validation and all the necessary information to enable experts and the general public alike to decide on their priorities in achieving Net Zero.

Our focus on making available full disclosure of all aspects of a removal, including who checked it, rather than focusing on the quality of checks on inaccessible information, means we can remove costs, shorten the verification timescale, manage and market a wide range of classified removals, and let buyers of CCC decide which features of the available removals are most desirable and convert into those if they wish on the Platform.



Our solution:

The CCS carbon removals rating

The aim of the CCS Carbon Platform Rating is to overcome the one-size-fits-all assumption many existing credits rely on. We believe CCC will open up the market for novel CDR products and processes, enabling all buyers to make informed choices about the most appropriate routes to offset their own CO₂ emissions, which will accelerate the achievement of Net Zero.

Why classify carbon removals?

The purpose of classifying CDRs is to assess and rank each key attribute of the removal processes in order to distinguish between those processes that significantly mitigate the carbon emissions problem, and those that do so to a lesser degree.

Essentially, the highest rated removals will remove carbon from the atmosphere in perpetuity, while the lowest rated will remove carbon for a significantly shorter time-period.

Though any classification system is open to subjectivity, ours is based simply on giving highest ratings to carbon removals that make the greatest contribution to achieving Net Zero. It also recognizes that lower-rated carbon removals have an important contribution to make towards achieving Net Zero, albeit for a limited time-period and with lesser overall impact than higher rated CDRs.

A classification system must offer an accessible and compelling guide for those wishing to meet the Net Zero challenge regardless of their level of climate change knowledge or expertise. Links between the rating of removals and the problem they can help solve must be simple, transparent and trustworthy.

We believe that a removal system with clear links to the aim of achieving Net Zero will prove more engaging for users. Furthermore, if there is trust in the system and its outcomes across all levels of expertise, it will engender confidence and lead to wider adoption.



Quantification:

Scoring and rating

Net Zero is a global objective to which CDR contributes. The scale of this contribution is a combination of our ability to reduce existing emissions and our ingenuity in achieving CDR technologies that can scale rapidly. In addition, the balance between reduction and removal efforts will be driven by economics, depending on which is more favourable at any given future point. **All of this relies on trust in the accounting of both removals and reductions.**

Therefore, to provide a score from 0-100 for each CDR, we consider the following aspects of the process:

1. **Certainty of mass of biogenic CO₂.** Firstly, is it important to assess the likely measurement error of the actual mass of carbon removed.
2. Process record keeping. The rating system takes into account the quality and accuracy of the record keeping associated with the carbon removals. Transparency and trustworthiness require processes to be open to inspection by all so that the reported attributes of any removal are real.
3. Stability of the stored carbon. We rate the carbon stored on its physical and chemical stability.
4. Permanence of storage method. Assessment, and ultimately, scientific evaluation, is made of the actual process of carbon storage to ensure that once carbon is removed it stays that way.
5. Stewardship of stored carbon. We assess the likelihood that the circumstances affecting carbon storage may change over time.
6. Additionality. A CDR is considered as additional if it would not have happened but for the financial value assigned to that removal. This is not an intuitive concept, but it basically encourages allocation of economic resources so that the probability of reaching Net Zero is maximised. In our classification we have allocated the highest scores for processes that clearly exhibit direct links between financial reward and carbon removal amounts. Where these links become indirect a lower score is achieved, and where there is no link at all, the process is not admissible to the rating process.



The Ratings

Any process that removes CO₂ from the atmosphere and satisfies the classifications' rules of acceptance can be scored, and there is no cost to the project in going through the process. Once a score has been determined or the CDR, it will fall into one of the following ratings:

SCORE	RATING
90 - 100	A1
80 - 89	A2
70 - 79	A3
60 - 69	B1
50 - 59	B2
40 - 49	B3
30 - 39	C1
20 - 29	C2
10 - 19	C3



All carbon removal kgs are unique

Carbon Removal NFTs

Carbon can be removed from the atmosphere in a variety of ways, and some ways are better than others. Therefore, although we can classify similar capture and storage outcomes of carbon removal into a rating system, every amount of carbon removed is unique because it has its own particular characteristics, not least the identity of the owner.

It is for this reason that we propose the most appropriate form of digital ownership of carbon removal is through a non-fungible token (NFT).

By using blockchain technology to generate non-fungible carbon removal tokens, we can ensure that once anyone chooses to convert CCC into the NFTs available on the Platform, there is an immutable link created between owner and a specific amount of removed carbon with all the information regarding its classification and verification. Using the public blockchain ensures our carbon removals system is both decentralised and transparent.

Holding a Carbon Removal NFT – what do you get?

Owners of carbon removal NFTs (CRNFT) can be assured that they have purchased an amount of carbon that has been removed from the atmosphere and stored in a manner that ultimately is part of its rating. They can also be certain that the carbon removal represented by their CRNFT has not been previously used as an emission offset by another party, nor will it be used again in the future.

The metadata contained within the CRNFT gives the holder access to a huge amount of information which evidences where their carbon has come from, how it was processed and where it is stored. Once converted, this data will also identify the holder.

The ability to identify the owner of each CRNFT is essential. It enables anyone to check the veracity of an NFT owner's carbon offsetting claim.



Community verification

Transparent capture and storage provenance

The extensive metadata contained within each CRNFT, including ownership details, allows the community of CRNFT holders and anyone who cares about the environment, or the carbon offset marketplace in general, to check and verify that there is no abuse of the system throughout the lifecycle of carbon capture, storage and eventual claim of offset against emissions.

For example, a corporation might include a particular CRNFT in its annual report as an offset against certain emissions. With our Platform's CRNFTs, it is easy for the general public to check that an individual CRNFT has not been used previously by another party to claim an offset, and our system makes it straightforward to gauge whether the rating of offset matches the claim related to it.

Availability and supply

The availability of CRNFTs is underpinned by production of biochar by Standard Gas Technologies Limited. However, this represents only a fraction of the future CRNFT availability, which will be proportional to the onboarded global market for CDRs as they are all eligible to be classified for free.

At the time of writing, (March 2022) the CO₂ removals market remains small (c.\$500 million), but momentum is building. As the carbon credit market matures it is expected that demand for carbon removals will increase exponentially as emission reductions no longer become commercially viable. Meanwhile, carbon capture, utilisation and storage ("CCUS") applications (both fossil and bio-based) are growing, offering both carbon avoidance and removals respectively.

The CCUS market from both bio-based and fossil processes is expected to reach \$4-10 billion by 2026-27¹. Meanwhile, the market for voluntary carbon credits is expected to increase by a factor of 15 by 2030 and a factor of 100 by 2050, suggesting the market for carbon credits could be worth \$50 billion in 2030².

[1] Climate Institute, 2021

[2] Taskforce on Scaling Voluntary Carbon Market [TSVCM] 2021



CRNFT specification

CRNFTs cannot be purchased on any cryptocurrency exchange. They are only available through the CCS Carbon Platform, and specifically, they are available for conversion from CCC via the periodic Matching and Clearing procedure described below.

Once converted, the carbon removal that is represented by the CRNFT is deemed to have been used as an offset against carbon emissions of the holder, and this fact is indelibly recorded in the CRNFT's metadata. While CRNFTs can be transferred to other wallets, once converted, they will no longer be available for conversion on the CCS Carbon Platform.

A holder of CCC can choose to convert that to a range of available CRNFTs on the Platform. Some CRNFTs will require more CCC for conversion than others as they have a higher classification rating and thus correspond to carbon removed with higher quality of verification and for a longer time. Once CCC is converted to a CRNFT only then does that CRNFT acquire the information as to who used it. This last piece of immutable transparent data ensures no double counting and a secure record for the owner to present against their emissions.



CCC

Native utility token

CCC is the unit of currency that a holder may convert into a CRNFT, and additionally represents a future carbon removal from the Standard Gas carbon removals process. This means that if you buy CCC you are guaranteed to be able to convert into CRNFT offered on the Platform by Standard Gas Technologies in respect of their biochar production. This “tether” is described more fully later in this document.

However, owning CCC does not determine when exactly you will be able to convert into a CRNFT since this is dependent on the timing of CDR production and subsequent offering of the corresponding CRNFT on the Platform. However, this ensures the most valuable feature of the CCS Carbon Platform as any purchase of CCC incentivises the production of more CDR so that CRNFTs can be available for conversion. This means buying CCC drives more CDR which is what the planet needs.

Underlying value and market expectations

Since CCC is effectively tethered to a particular type of carbon removal (SGT’s biochar), its market value should be related to the expected value of this carbon removal at some undefined future point. At the time of writing, there is only a tacit differentiation between “good” and “poor” carbon removals in contrast to our proposed quantifiable differentiation. For example, you might buy one removal for \$10 per tonne, and another for over \$50 per tonne. Each removal would be certified but have very different characteristics.

According to the January 2021 report Taskforce on Scaling Voluntary Carbon Markets, CCUS derived from “avoided nature-loss” (such as commitments to prevent deforestation) by 2030 should remain at the low end of the price scale and cost between \$10 to \$50 per tonne of CO₂. In contrast, at the high end of the scale, removals such as technology-based bio-energy with carbon capture and storage (“BECCS”), and direct air carbon capture and storage, will likely command prices between \$100 and \$300 per tonne of CO₂.

Since one CCC is convertible for 1kg of BECCS based (SGTs) future CO₂ removal, then it might be reasonable to expect the future price of one CCC could be around \$0.1-\$0.2 and could represent good value when trading lower prices.



Blockchain network

We have chosen the Binance Smart Chain (BSC) as the blockchain network to launch CCC and to mint CRNFTs at the appropriate time.

Binance is the largest cryptocurrency exchange in the world in terms of daily trading volume. BSC has established itself as one of the top blockchain platforms for smart contract development due to its adoption of a highly centralised consensus “proof of stake-authority” (PoS) model, which has enabled significant gains in both transaction throughput and cost efficiency.

For example, competitor cryptocurrency network Ethereum has recently recorded fees over \$100 for a single transaction, while BSC charges between \$0.01-0.05 for identical services.

BSC is also compatible with popular crypto wallets, such as Trust Wallet and MetaMask, and it is quicker and more cost-efficient for users to move their funds and interact with smart contracts. It is compatible with the Ethereum Virtual Machine, which allows for an easy transition from Ethereum.

When it comes to decentralised finance, there is a significant DApp cross-over between BSC and Ethereum due to the blockchains' compatibility. This means developers can easily port applications from Ethereum to BSC.



Blockchain – environmental considerations

Scrutiny of the environmental impact of blockchain networks is intense. This is because networks such as Bitcoin and Ethereum require vast amounts of power to maintain the proof of work (PoW) model they employ to validate transactions and add new blocks to the blockchain.

Consequently, the carbon footprint of PoW-based cryptocurrencies such as Bitcoin and Ethereum are significant. In contrast, networks based on alternative consensus mechanisms such as PoS consume significantly less electricity and consequently have a much lower environmental impact. Indeed, studies have shown that the Bitcoin PoW mechanism's energy consumption per transaction is at least a hundred times higher, and in some cases a thousand times higher, than the energy consumption of PoS systems³.

The PoS model employed by the BSC uses randomly selected miners, rather than a competitive process, to validate the network and as such is less expensive and drastically reduces the environmental impact of the network operation. Quoting directly from Binance⁴:

“By refraining from using gigantic mining facilities, the PoS model is generally recognized to be more eco-friendly than PoW. In addition, PoS networks are considered more profitable, since they provide passive income generation through DeFi. Many NFT marketplaces and creators are thus migrating to PoS networks. Even Ethereum is on the way to transitioning to a PoS model under the Ethereum 2.0 update.”

[3] Platt, M., Sedlmeir, J., Platt, D., Tasca, P., Xu, J., Vadgama, N. and Ibañez, J.I., 2021. Energy footprint of blockchain consensus mechanisms beyond proof-of-work. arXiv preprint arXiv:2109.03667.

[4] <https://www.binance.com/en/blog/nft/how-do-nfts-impact-the-environment-421499824684902449>



CCC initial issue amount

Our promise to holders of CCC is that they will be able to convert into CRNFT at a future date if they choose. Initially, we will mint 100,000,000 CCC representing 100,000,000 kg of carbon removal. We estimate that the first available conversion into CRNFT will be in April 2023, growing from there we expect there to be a minimum of 3,000,000 kg of CRNFT ready to be offered for conversions on the CCS Carbon Platform by the end of that year.

CCC grants

Of the initial supply of CCC there will be the following amounts will be granted:

- To the CCS team – 10,000,000
- For marketing purposes – 1,000,000

Additionally, liquidity providers will be granted incentives of 1% per day



About us:

About CCS

CCS was established to market and sell the carbon removals that Standard Gas produces via its future SG100 energy-from-waste plants. To verify and validate its carbon removals by existing means is a lengthy and expensive process. This was due to be completed for the removals to receive a widely recognised stamp of approval. Although SGT's removals have less assured permanence than geological sequestration, they are far more affordable. For this reason, it seemed counterintuitive that they were branded with the same stamp. Consequently, we developed a classification system with an independent, globally respected academic institute having final say on the weightings of the system to ensure broad applicability. It is important to any owner that their CRNFTs stands up against any claims of green washing or bias towards particular CDR processes so in addition to the classification system, the data that goes into the classification needed to be available to inspect. This is where web3 technology was identified as a suitable solution that could automate the process ensuring transparency, accountability and accessibility to the carbon removal tokens.



Disclaimer:

Nothing in this White Paper is an offer to sell, or the solicitation of an offer to buy, any CCS Carbon Removal Tokens or any other form of asset ("Token"). Carbon Char Store Ltd. ("CCS") is publishing this White Paper solely to receive feedback and comments from the public. If and when CCS offers for sale any Tokens (or another fundraising mechanism, such as a Simple Agreement for Future Tokens), it will do so through definitive offering documents, including a disclosure document and risk factors. Those definitive documents also are expected to include an updated version of this White Paper, which may differ significantly from the current version. If and when CCS makes such an offering for the Tokens, the offering likely will be available solely to investors who are classified under the handbook of the Financial Conduct Authority of the United Kingdom as not being retail investors. Nothing in this White Paper should be treated or read as a guarantee or promise of how CCS's business or the Tokens will develop or of the utility or value of the Tokens. This White Paper outlines current plans, which could change at its discretion, and the success of which will depend on many factors outside CCS's control, including market-based factors and factors within the data and cryptocurrency industries, among others. Any statements about future events are based solely on CCS's analysis of the issues described in this White Paper. That analysis may prove to be incorrect.



Appendix I:

The CCS Carbon Platform – a users' guide

Placing orders

When a buyer of CCC is ready to obtain irrevocably proof of an amount of removed carbon, they place orders in the CCS Carbon Platform, and if those orders are matched, they convert their CCC for CRNFT.

While some owners of CCC may be concerned primarily about the volume of carbon they remove rather than the quality of that carbon removal, the marketplace's baseline quality requirement will ensure carbon is always removed from the atmosphere.

Alternatively, you may want the carbon you caused to be removed to be locked away for eons in the most secure manner possible. The choice is yours.

If you want to remove the most carbon for your CCC you would choose a low rated CRNFT as this will likely require less CCC per kg of CDR that it represents, conversely if you want to remove an amount of carbon through a CDR method that is scientifically proved to be more permanent you will choose to convert to a high rated CRNFT which may require more CCC per kg of CDR. CCC holders can always choose to convert to a kg of CDR produced through the SGT method and this will always require one CCC.

Once orders have been accepted on the Platform they are matched with offers of CRNFT of similar ratings. At the point of conversion the identity and details of the offered removal will be immutably recorded in the CRNFT and minted by the Platform. This will enable holders to prove beyond any doubt that they alone, and no other, have offset a portion of their emissions against a specified amount of carbon that has been captured and stored. After conversion, the CCC converted will be burnt – i.e., permanently removed from the blockchain.

As described above, CRNFTs may only be converted from CCC in the CCS Carbon Platform, and CRNFTs are not available on any cryptocurrency exchanges. They may be transferred, but they serve as a registry of the actual carbon sequestered and its provenance, along with the details of who has used such carbon as an offset against their carbon emissions. The provenance and ownership of any CRNFT is freely available for public view.

CCC is tethered to an actual mass of removals because one CCC is always exchangeable for 1kg of carbon removed by Standard Gas Technologies Limited's patented process. The amount of CCC required to convert into other ratings of CRNFT is dependent on supply and demand. We expect higher qualities of carbon removal will require more CCC than lower qualities. However, this will depend on a periodic price setting process that balances orders for any given rating against offers available in that rating. Once price setting has occurred, the CCC becomes convertible for the 10 different ratings of CRNFT at those prices set. These conversion prices will pivot around the SGT removal which is always convertible at 1 CCC for 1kg of removal. This we call the conversion period.



Appendix I:

Showing offers – selling your CDRs through our CCS marketplace

If you are capturing and storing carbon, you can have your carbon removal rated using the CCS rating protocol described above, and the CCS Removal Platform will offer it for conversion as a CRNFT based on a bilateral contractual arrangement with you. This contract will provide for a CCC amount, related to the rating category conversion price but subject to agreed minimums.

If the resulting CRNFT is rated in the same band as the typical SGT removals, then you will receive 1 CCC minus a listing fee in CCC (this fee supports the free onboarding of CDR ensuring wide adoption) from CCS for each CRNFT that can be offered. In this case, your removal will be “worth” whatever the fiat value of the CCC you receive at the time you monetise these CCC on any one of the 3rd party exchanges that CCC is listed.

However, if your removal is any other rating, you cannot be sure of the exact number of CCC that you will receive for the CRNFT until the price setting completes. The price (in CCC) of any grade of removal purely dependent on supply and demand. However, conversion of any CRNFT related to your removal, and as such the amount of CCC you receive under your contract with CCS, will be subject to agreed minimum conversion prices.

Matching and clearing procedure

The CRNFT marketplace is not continuous – you cannot convert into CRNFTs on demand. This is because CCC represents a future offset of carbon, and we cannot be absolutely sure when the corresponding CRNFT will be minted as they have to have been verified by adherence to the classification system described above. Therefore, the marketplace will operate periodically when sufficient offsets are available. CCC holders will be informed of the start of a conversion period with sufficient advance notice.

The process of showing offers and placing orders happens in two phases. Firstly, there is a period of price setting. During this process the conversion prices between CCC and any given rating of CRNFT are set (except for rating SGT's CDRs which are fixed as 1:1) depending on the number of orders received versus the number of offers made in each rating category. Secondly, there is a period of conversion, where remaining offers and orders (these are offers and orders that accept the now set CCC conversion rates for each rating) are matched at the fixed CCC rate for each rating category.



Appendix I:

Price setting phase

During this phase, the quantity of CCC required to convert into a quantity of CRNFT of a particular rating is set. This price setting phase is the beginning of a Clearing Period.

Orders are placed by transferring an amount of CCC into the clearing wallet of each CRNFT rating. If you want to convert into 1 CRNFT in the A rating, then you should transfer this CCC to the specified wallet address. Similarly, if the Platform has rights to a certain mass of CDR with a given rating then this also should be transferred to the relevant clearing wallet. Clearing wallets only accept CCC and CRNFT of the correct rating. At all times you are the owner of these tokens, and therefore may request their return to your wallet at any time up until the end of the conversion period.

It is a firm commitment to holders of CCC that they will be able to exchange 1 CCC for 1kg CRNFT of SGT's CDR, subject to availability. Therefore, regardless of the number of orders placed for CRNFTs from SGT the conversion price will remain fixed at 1 CCC.

For the other types of CDR categories, which have their own rating, the conversion price of each category will be fixed at the ratio of orders to offers when the price setting period ends. For example, if there are 100 CRNFTs (rated A) offered, and 105 orders, then at the end of the price setting phase, the conversion price of this rating category will be fixed at 1.05 CCC for each 1kg CRNFT of this rating.

Settlement phase

To prevent parties placing spurious orders and offers to manipulate the CRNFT conversion price of a particular rating, the platform allows for a period where the price is known, and parties make a decision whether to proceed or not with a conversion in the knowledge of the conversion price they will be able to achieve.

The Settlement Phase starts as soon as the Price Setting Phase ends. During this phase, orders may be added or withdrawn. At the end of this phase, all remaining orders will be matched at the conversion prices fixed at the end of the price setting phase.

It may be the case that during this phase there are more orders than offers of CRNFT in the fixed rating category, or there may be a surplus of offers. Where there is a deficit of CRNFT, orders will be settled by giving priority to those buyers that have placed their orders earlier in the price setting phase. Similarly, where there is a deficit of orders, those CRNFT which have been offered earlier in the conversion period will be given priority.

Once all orders and offers that can be matched are matched, the ownership details are recorded into the matched CRNFT and transferred from the clearing wallet to the origin wallet of the matched CCC. Once the CRNFT is transferred, it can be freely transferred to other wallets, but it will be indelibly identified as a CRNFT that has been used for a specific carbon offset.

All unmatched tokens will be returned to their original wallets immediately.



Appendix II:

CCC base tether – SG CarbonChar

We have described how, subject to availability, CCC guarantees the holder an exchange into a fixed amount of actual carbon removed from the environment and stored in a manner that ensures it will not leak back into the environment for hundreds if not thousands of years. This guarantee effectively tethers the value of 1 CCC to the value of this carbon removal and storage.

This guaranteed carbon removal and storage is represented by CRNFTs placed on the CCS Carbon Platform on behalf of Standard Gas Technologies Ltd (SGT). In this section, we offer an overview of SGT's technology and describe the features of its carbon removal and storage product, SG CarbonChar.

SGT technology and SG CarbonChar overview

SGT has developed and patented a carbon-negative advanced thermal cracking process – SG100 technology – that converts a wide range of biogenic and non-recyclable waste streams into two products: a clean, high-energy gas (syngas or biogas) and carbon char. Processable wastes range from plant based (biogenic) wastes, refuse derived fuels, and municipal and commercial solid wastes, including plastics, to some hazardous wastes.

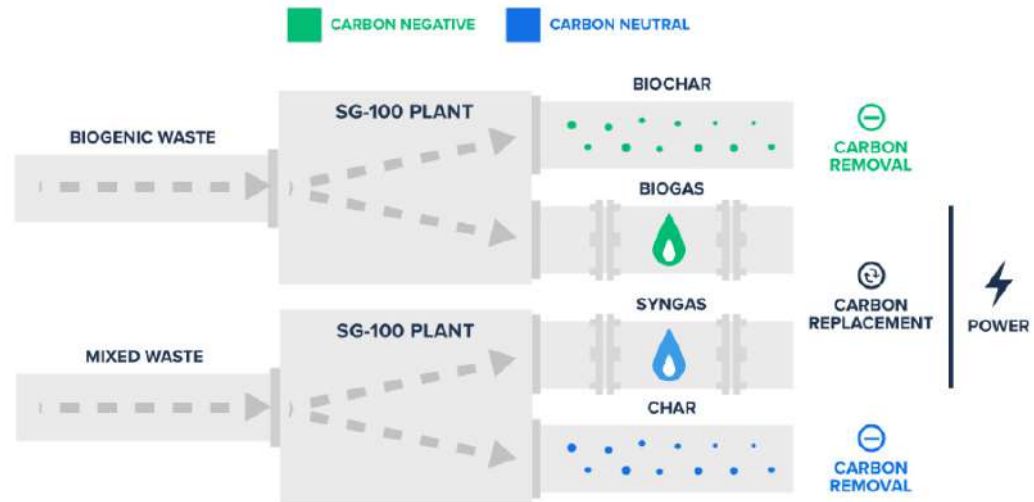
SGT's syngas can be used to generate electricity, heat and steam, and also it can be processed to provide renewable transport fuels, gas for grid injection and chemical feedstocks. Electricity generated with biogas from biogenic waste can be used to generate Green Hydrogen.

SG100 by-product char, which comes in different grades and composition depending on feedstock waste streams, is the medium for carbon capture and removal via sequestration (subject to clearing the stringent lifecycle rules of the classification system), and also the basis for CCC.



Appendix II:

A schematic of the SGT process





Appendix II:

Biochar – carbon capture and sequestration

This aim of this section is to explain: 1) the production and composition of SG CarbonChar; 2) how it makes carbon removal possible; 3) the carbon sequestration pathways to facilitate and ensure carbon removal qualification; 4) the carbon accounting justification of SG Carbon Removal. To assist in this explanation, the following definitions are useful:

Definitions

Biogenic	A term applied to carbon within any substance which is not derived from the mining of fossil carbon in the industrial age.
Biogenic Carbon Percentage (“BioC%”)	An initial 14C analysis (ISO-17025 compliant) that is conducted on a broad range of SG CarbonChars derived from feedstock types (“type” as defined by the local regulator e.g.: “waste code” in UK).
Carbon Removal (“CDR”)	The permanent removal of biogenic carbon from the atmosphere and biosphere. Permanence is achieved through suitable sequestration of what was once biogenic CO ₂ , assuming that removal is from a process which under a verified ISO-14064 accounting approach is less CO ₂ e emitting than that process’ counterfactual (i.e., what would have happened if the process had not existed) on an ongoing basis.
Fractional assessment of feedstock at gate (“FAa”)	The process by which SGT determines the make-up by of the general feedstock by Waste Code on arrival. This is completed and documented by a gateway waste monitoring process where a representative sample of waste is checked by inspection on its arrival to ensure it matches the waste codes given by the waste supplier.
Fractional assessment of the SG CarbonChar at laboratory (“FAI”)	Periodically, samples are taken that best represent the biochar produced from a single consignment of waste, and are sent to a third-party laboratory to determine the exact BioC% of those biochars.
Fractional assessment of SG CarbonChar (“FA”)	Together, the FAa and FAI processes.
Framework Verifier (“VER”)	A third-party ISO-14064-3 qualified consultant tasked with oversight of all aspects of the process of carbon capture and storage.
SG Carbon Removal	A quantified amount in units of tonnes of CO ₂ e corresponding to: $3.67 \sum_{i=1}^n M_i B_i$ where Mi is the mass of the Waste Code i constituent, and Bi is the BioC% for Waste Code i, and is subsequently sequestered by a regulatory compliant pathway ensuring permanence of at least 100 years and has other VER stipulated attributes.
Waste Code	Waste classification codes, also referred to as LoW (List of Waste) or EWC (European Waste Catalogue) codes for hazardous and non-hazardous waste.



Appendix II:

Production, definition and attributes of SG CarbonChar

Process producing SG CarbonChar – As mentioned above, the SG100 processes non-recyclable wastes that today are predominantly landfilled or incinerated. SG100 technology produces a clean gas, and a carbon rich solid, SG CarbonChar.

Attributes of SG CarbonChar – As a product of pyrolysis of a variety of waste feedstock streams, the biogenic content of SG CarbonChar will vary continuously. However, the mass of biogenic carbon within any SG CarbonChar produced in a given period can be determined by:

- grading arriving feedstock into constituent Waste Codes.
- pre-evaluation of the biogenic carbon content of biochars produced by each Waste Code.
- implementing a corrective protocol that allows for periodic adaptation of the process such that FAI matches the biogenic carbon assessed through FAa.

Monitoring of SG CarbonChar attributes

The aim of the monitoring protocol is to provide certainty that FAa yields an accurate biogenic carbon mass within the SG CarbonChar for any given period. The VER will determine:

- the laboratory to perform appropriate testing.
- the tolerances allowed between FAa estimated carbon content and FAI carbon content, reflecting that there are unavoidable systematic errors in FAa.
- implementing a corrective protocol that allows for periodic adaptation of the process such that FAI matches the biogenic carbon assessed through FAa.



Appendix II:

Sequestration pathways

Before CCS can apply to have an amount of SG CarbonChar and the SG Carbon Removal it represents, it will have a:

- detailed record of waste code constituent for that quantum (as per FAa).
- BioC% value calculated for that amount from the FAa.
- record of any FAI adjustment factor applied.
- VER acceptable sequestration pathway (see below).

Only then can the SG Carbon Removal calculation be applied to the amount of SG CarbonChar. CCS is also responsible for:

- record keeping for each delivery of waste, maintaining a stock of samples taken from each delivery as part of FAa, and maintaining the records of the FAa process.
- record keeping of the results of third-party feedstock analysis.
- record keeping of any FAI analysis, both initial and ongoing.
- a log of SG Carbon Removal calculations used.



Appendix II:

CCS also maintains various pathways to permanent sequestration or storage. To achieve this CCS enters into commercial contracts with various third-parties to take the SG CarbonChar and use it in such a way that is deemed a sequestration for the purposes of carbon removal. The VER verifies that each biochar take-off agreement is sufficient to:

- ensure the SG CarbonChar is only used for purposes that meet its definition of permanent sequestration.
- ensure that sufficient research has been done to estimate the permanence of that sequestration, and that it is in line with the widely used term “carbon removal”.

In addition, the VER will audit the mass of SG CarbonChar physically sequestered either by requiring a proof of removal from the sequestering party or through a suitable warranty in the take-off agreement.

Only the mass of SG CarbonChar that meets rating [X] as described above will be counted as SG Carbon Removal and be available for conversion on the CCS Removal Platform.



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