

Public Consultation:

**Gold Standard  
Approach to Third-Party  
Crypto Instruments and  
Tokens**

Response document by  
**Toucan Protocol.**

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# Executive Summary

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Toucan appreciates the opportunity of providing input to Gold Standard's Consultation, as we firmly believe that an institutionalised tokenization solution will not only be well-received by the market but also play a key role in digitising and scaling the VCM to drive more finance to the most effective climate solutions. Through an institutionalised bi-directional bridge with the necessary safeguards for market participants, the on-chain carbon market can enter the next phase towards broader market adoption from both legacy market participants as well as new digital demand sources, thus accelerating our path to net zero.

Toucan has been an active participant in the IETA Digital Climate Markets Working Group and supports the establishment of the Code of Best Practices framework as applied to the **tokenization of carbon credits**. As such, Toucan's infrastructure can be used for both **native and reference tokenization** of carbon credits as defined in IETA's Code of Best Practices.

Toucan believes that the **direct tokenization pathway** — wherein the environmental attributes attach to the token — is the best approach because it **addresses safeguarding concerns** by default while being in line with important **web 3.0 principles** that are key for greater adoption.

Toucan recognizes that a direct approach requires some adjustments to the Gold Standard registry software, an API integration as well as some changes to Gold Standard's Terms of Use. However, if these changes cannot be implemented at Gold Standard by Q1 2023, and Gold Standard's

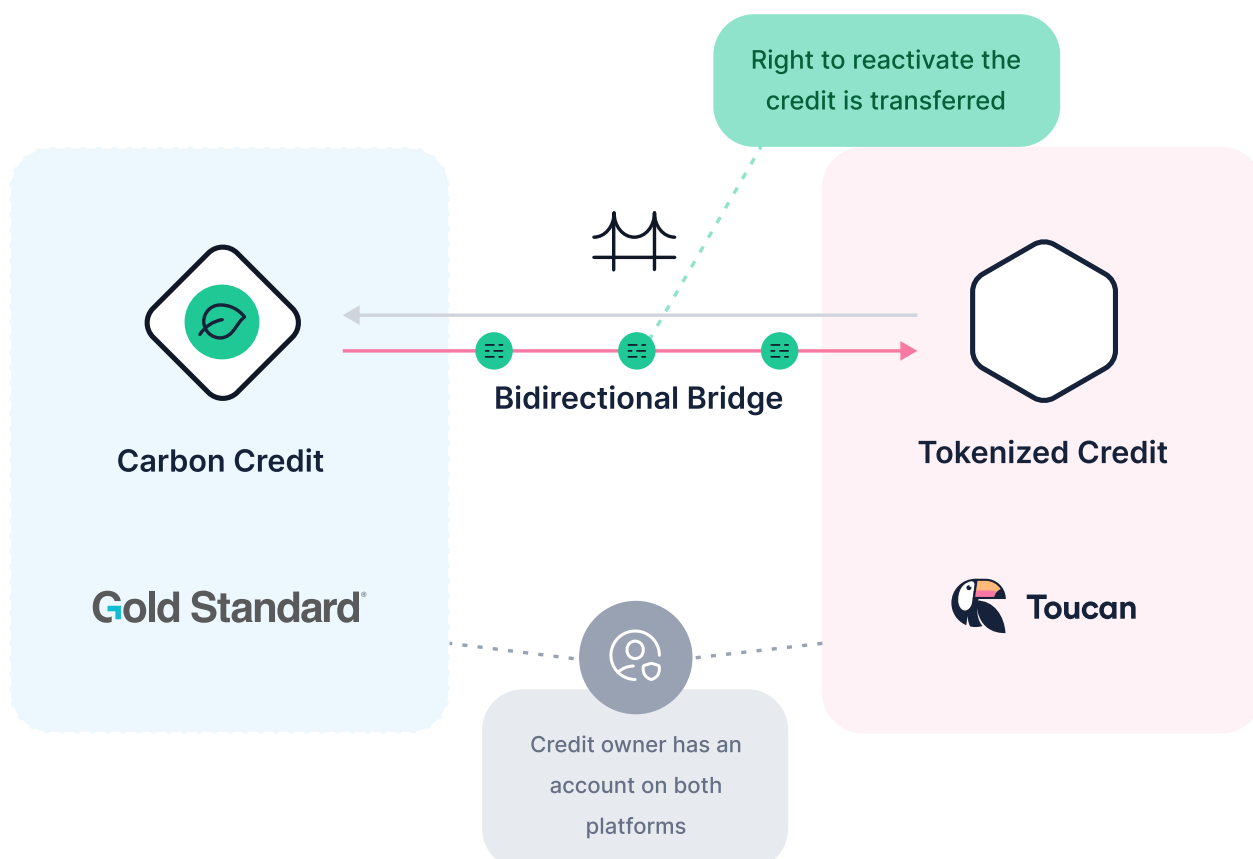
preference is to start with a custodial approach as this fits better with its change management roadmap, Toucan can implement a custodial tokenization model operating under a Toucan registry account. This account would host the 'immobilized carbon credits' linked on a 1:1 basis with the respective minted carbon reference token.

It should be noted that this is not a custodial operation as administered in traditional financial markets as regards to assets. In this case, the credits cannot be moved during the period of 'custody'. The only possible transactions are inflows into the vault-like account, outflows to a specific other account in cases of de-tokenization, and finally, retirements for users without a standard account.

## ***Definition of 'custody': the protective care or guardianship of someone or something***

Therefore Toucan suggests evaluating the amendment of the Terms of Use for the particular use case of 'Tokenization', whereby it is stated that **"owner of a TCO<sub>2</sub> is the owner of the right to re-activate the credit in the tokenization account"**. That way the operators of such an account would in our view not fall under a definition as 'custodians'.

Our preliminary understanding is that Gold Standard views this tokenization process as a manual operation in line with the current functionality of its registry. Toucan aims to automate as much as possible in order to reduce the likelihood of human error, while future functionalities such as an API as well as direct and native tokenization pathways are developed and established.



## Key points

### → Regulatory:

Toucan believes that the requirements applied to a tokenization platform, should be in line with current market participants and practices in the VCM:

- **The VCM is an unregulated market where carbon credits are not classified as securities.** This holds true for the tokenized market where carbon credits are considered commodities and classified as utility tokens. In fact, Toucan's tokens, whether the reference token **TCO2** or **pool token NCT** are all considered **utility tokens** under the Swiss regulatory framework and thus **not subject to KYC**.
- While there are ongoing regulatory discussions about the carbon credit markets in many jurisdictions, the outcomes are for now uncertain. However, it is likely that the on-chain carbon market can evolve with any new compliance requirements the VCM may become

subject to, as the **tokenization in itself should not change a classification**.

### → Status and Accounting of Credits and Tokens in Registry:

The **additional state of "immobilized"/"tokenized"** in the Gold Standard registry are introduced with credits in those states moving into dedicated accounts. These accounts, holding tokenized credits, represent a book-keeping function in the direct model and a custodial account in the secured/custodial model. In the deterministic/direct model, the token represents the actual credit along with its environmental attributes. With the process of redemption (de-tokenization), the original credits are re-activated out of these dedicated accounts and transferred to the owner's registry account.

### → Onboarding of Tokenization Platforms:

Toucan recommends that Gold Standard undertake a **standard KYC process** on any tokenization platform in line with other service level agreements, prior to entering into any collaboration agreement for tokenization of VERs from its registry. As part of this process, Gold Standard should receive not only the **standard corporate documentation** but also any **architecture description, smart contract audit reports**.

### → Identification of Users:

Regardless of the fact that the Toucan tokens are not subject to any KYC requirements under the Swiss regulatory framework as applied to digital assets, Toucan is prepared to **implement identification (including AML) requirements** for entities looking to interact with the Toucan Carbon Bridge, i.e. for users looking to tokenize (on-ramp) or de-tokenize (off-ramp) credits.

- In the **custodial model**, this would be covered through the **account opening process** for the tokenization service provider as well as qualifying existing accounts to be eligible for tokenization. After linking specific wallet addresses with their standard registry accounts, users can transfer credits into the custodial account, with the ownership of the credits transferred to the owner of the respective token, which is then sent to the specified wallet address as part of the tokenization process.
- In the **direct tokenization model**, this could be realised by introducing a **new Gold Standard registry account type** that would allow users to tokenize once they have linked their identity to a wallet address. Users who want to activate such a model for their account, go through a process, which links the identity data of their account with wallet address to be used. Depending on the options within Gold Standard's system, it can be feasible to use a 3rd party service provider that hosts the identification data related to tokenization, while both Gold Standard and the tokenization platform embed a

verification of identification signal (e.g. web3 account whitelist or NFT token) into their system.

### → Double Issuance:

Any tokenization platform must address "double issuance" and Toucan's existing infrastructure platform already provides an **auditable, bi-directional link** between the standard's registry and the platform. With the improved clarity on the status of the original credits and tokens and the retirement functionality **firmly linked to the 1:1 reference token**, this risk is mitigated.

### → Pooling Policy Implementation:

Toucan recognizes that different standards have unique pooling policies. Ensuring an implementation in line with specified policies will build trust with the standards. The policy design should not be limited to restrictions, but also explore other options like active pool governance participations, specific veto, etc. **Too rigid policies can reduce the utility of the carbon tokens** and infrastructure. Toucan can "hard code" certain restrictions into the pooled smart contracts to address specific pooling concerns.

### → Fractionalization of Tokens:

Toucan Protocol fully agrees with Gold Standard on its statement about the **significant potential** that sub-tonne fractions of retirements can have on unlocking material new sources of demand. Toucan Protocol would be very happy to engage with Gold Standard on designing and implementing a solution fit to Gold Standard's existing infrastructure in order to enable this use case of micro-retirements that web3 is already successfully demonstrating.

### → Anti-Fraud:

By **onboarding and vetting** its tokenization counterparties, Gold Standard will mitigate the risk of fraud or fraudulent behaviour by such counterparties.

## Areas of greatest potential:

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### A Improved market experience:

Via the tokenization of VERs, Toucan's infrastructure will improve the **supply and demand experience** for market participants. Suppliers can directly transact and sell credits without additional layers of intermediaries while buyers also encounter less friction and risk. With more transaction transparency will come better price discovery, thereby supporting the growth of the VCM.

### B Market expansion:

Tokenized carbon is **programmable** and can be integrated into IT and web3 projects, creating **higher utility** and new use cases for carbon. Over 100 projects are building on Toucan's infrastructure, opening up the possibilities for carbon as a green building block and paving the way for microtransactions.

### C Deeper liquidity:

In an open and composable ecosystem, **tokenized carbon credits can be pooled** and used as collateral in a wide range of decentralized finance (DeFi) applications. Users can lend and borrow, stake, or they can turn into a liquidity provider (LP) for specific pools in return for yield. These new sources of demand can help carbon markets scale to the size we need to combat climate change.

## Implementation Roadmap and Options - Toucan following Gold Standard's requests and constraints

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**Cognizant of Gold Standard's perspective and assumptions we would like to outline a roadmap as a recommendation.** Toucan has gained significant experience from launching its tokenization protocol and moving from manual processes to more automated operations very quickly right after launch. Now that such a setup will be a joint operation with the Standards, we want to **ensure the joint system is robust enough for a climate and market positive launch**. As much as possible, we would want to avoid manual administration and move to programmatic processes as fast as possible. The focus here is the **reduction of human error and synchronisation delays** that serve integrity. We would prefer to pay for engineering capacity that supports GS and its service provider with the implementation of the necessary functionality rather than operating under a process that relies on manual operation for too long. Moving forward, a direct model will require a sufficient level of automation in order to really label the solution 'deterministic'. This becomes evident in the retirement process, whereby no additional action should be required by anybody to reflect an on-chain retired ('burned') token as retired in the registry.

## Reference Tokenization: Fast-track implementation evolving the centralized and manual setup into an automated direct (deterministic) setup.

- Before allowing ANY tokenization, we recommend GS **implements the following minimum**.
  - Introduce new data field for additional state(s) of 'tokenized' / 'immobilized' copying the functionality as already implemented around the retirement module, whereby the fields are public but not all fields need to be filled out.
  - Introduce new data field(s) to list wallets within standard registry account
  - Require all accounts (sub-accounts or global account) dedicated to hold credits that are tokenized to be publicly available (or visible)
- **Establish a pilot period** of joint operation with selected lead users, before the tokenization functionality is made available to all.
  - Assess the feasibility and readiness of operation, from an operational overhead and security perspective.
  - Implement all possible automation before allowing scaling. Give 3rd party service providers sufficient mandate and access to execute automation and API / programmatic developments.
  - Best case: Tokenization, De-Tokenization and Retirement do not require manual interference by a central administrator in the middle of the process.
- **Optimise joint system** to leverage all inherent benefits of blockchain-based infrastructure.
  - Establish official pool governance process
  - Execute the launch of one or more high-quality carbon pools while also testing the pool governance process and evolving it.
  - Establish a continuous improvement process between GS, Toucan and the registry software provider to improve security, robustness and efficiency.Execute pilots around tokenization of PERs and implementation of a royalty mechanism whereby project developers benefit from secondary market activity

## Native tokenization

- Native tokenization represents a natural next step after reference tokenization, assuming it is initially defined as a model whereby both a credit and a token can be minted, and similar **synchronization is required between the on-chain states and the legacy registry**. It can evolve at some point into a model of native tokenization, whereby only tokens are minted as part of the issuance process and the registry moves partially or fully on chain. In both cases **the standard is the token issuer**.
- At the same time a number of **legal and compliance questions** need to be addressed in the relevant jurisdictions, e.g. how the token issuer role is framed in the model of native tokenization where a standard body issues credits directly as tokens, on a protocol like Toucan. In our understanding, in this model the **Standard is the token issuer**.
- In the case of Gold Standard, it is possible to build on the legal guidance that Toucan has obtained, which is also be used for the consultation with the Swiss regulator FINMA, in which the relevant tokenization models will be discussed with Toucan being the operator or service provider.
- We recommend to start developing the architecture of Native Tokenization with a qualified partner like Toucan right away, but wait with the launch of native tokenization until FINMA has given a response, since in this model Gold Standard will be perceived as the issuer and therefore subject of a potential FINMA ruling.
- Native tokenization should be **implemented by solution providers** operating on the application layer as opposed to a Layer 1 (L1) blockchain, such that native carbon tokens can be multi-chain assets, travelling where they find most utility and demand across the most thriving L1 ecosystems.

# Glossary

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## API

API stands for Application Programming Interface. APIs are mechanisms that enable two software components to communicate with each other using a set of definitions and protocols. For example, the weather bureau's software system contains daily weather data. The weather app on your phone "talks" to this system via APIs and shows you daily weather updates on your phone.

## Bi-directional Bridge

Bi-directional refers to the mechanism allowing both tokenization and de-tokenization or redemption.

## Bridge

Bridge refers to the mechanism of turning a credit in the standard registry into a tokenized credit hosted by Toucan's registry. A carbon credit that has been 'bridged' now exists as a token on the blockchain.

## Burning

Token burning means removing tokens from circulation which is a web3 term for making permanently and irreversibly inaccessible. This is technically how on-chain credits are retired.

## Direct tokens

A direct token is a carbon credit which has previously existed in an off-chain registry but has changed its state to 'tokenized' at the point of being bridged on-chain. The environmental claim has thus moved from the credit to the token.

A direct token enables an environmental claim to be made when the token is burnt on the blockchain and not when the state of the credit is changed from Tokenized to Retired within the registry of the Standard that originally issued the credit. (IETA Code of Best Practice).

## Immobilized Account

Immobilized account refers to a special account within the Verra registry that keeps track of all carbon credits that have been immobilized as part of a secured (custodian) pathway. Credits within the immobilized accounts don't have an owner since the ownership is represented by the holder of the respective carbon credit tokens.

## Native tokens

A native token is a carbon credit token that is issued by a standard body.



<b>NCT</b>	Nature Carbon Tonne, a carbon token that has been created and issued via the pooling infrastructure of Toucan Protocol.
<b>NFT</b>	A non-fungible token (NFT) is a unique digital identifier that cannot be copied, substituted, or subdivided, that is recorded in a blockchain, and that is used to certify authenticity and ownership. “Non-fungible” more or less means that it’s unique and can’t be replaced with something else. For example, a dollar is fungible — trade one for another dollar, and you’ll have exactly the same thing.
<b>Pool tokens</b>	Carbon pools are a way of grouping together tokens linked to credits with similar attributes. This creates standardized types of tokens (like NCT) that can be easily priced and traded on cryptocurrency exchanges.
<b>Redemption/ De-tokenization</b>	Direct Tokens can be exchanged for the original carbon credit in the carbon registry. This exchange can be achieved through a Two-Way Carbon Bridge that allows users to reverse the tokenization process for any given direct token. That way, on-chain carbon markets are fully interoperable with the existing carbon credit ecosystem, and a stable market can be ensured where prices are tied to the off-chain market.
<b>Reference tokens</b>	<p>According to the IETA Code of Best Practice, reference tokens are carbon credit tokens created by authorized market participants. For instance, TCO2s issued by Toucan can be considered reference tokens.</p> <p>Disclaimer: In Toucan’s current communication, reference tokens are used to describe pool tokens based on the the language developed by the TSVCM of reference contracts.</p>
<b>Smart contract</b>	A smart contract is a self-executing contract with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized blockchain network. The code controls the execution, and transactions are trackable and irreversible.
<b>TCO2</b>	TCO2 tokens are carbon credits that have been tokenized via the Toucan Carbon Bridge. Each TCO2 token is 1:1 backed by a carbon credit in a respected registry. Each TCO2 token carries all the attributes and metadata of the original carbon credit, making it specific to a given project and vintage.

## Tokenization

A process that converts original carbon credits into carbon tokens — a digital replica of a carbon credit stored on a blockchain. The IETA code of best practices specifies different paths for doing so, Native Tokenization (by the standards) vs. Reference Tokenization (by an approved 3rd party).

## Tokenized Account (Imobilization account)

Tokenized account refers to a special account within the Verra registry that keeps track of all carbon credits that have been tokenized via a direct approach. Credits within the tokenized accounts don't have an owner since the ownership is represented by the holder of the respective carbon credit tokens. Also, the environmental claims underpinning the credits within the tokenized account are now represented by the tokens rather than the credits in the tokenized accounts.

## Transaction hashes

A transaction hash is a unique string of characters that is given to every transaction that is verified and added to the blockchain.

## VER

Verified Emission Reduction

# Toucan in context

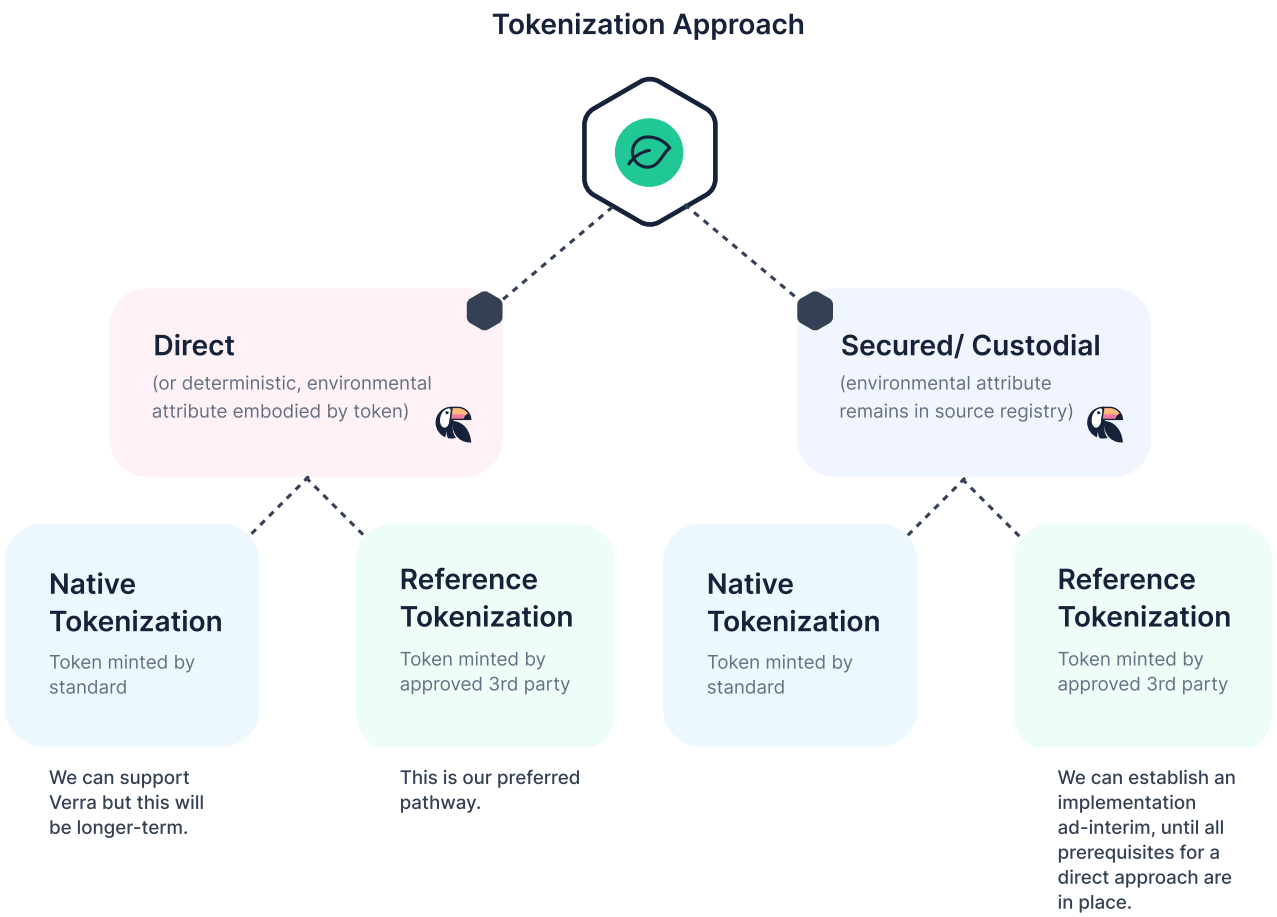
Toucan Protocol Association (‘Toucan’ ) appreciates the opportunity of participating in Gold Standard’s Consultation on ‘Conditions for consenting to tokenization of Gold Standard-issued credits (the ‘Consultation’).

In this section we briefly outline relevant background on Toucan Protocol and our work with other institutions in order to aid understanding of the context in which these responses are given.

Toucan operates a **blockchain-based infrastructure platform** to support a scalable and thriving carbon market. The Carbon Bridge module facilitates the conversion of voluntary carbon credits issued by standards programs into

**tokenized carbon credits**. It can be used for both native as well as reference tokenization of credits as defined by IETA’s Code of Best Practice for Digital Climate Markets.

**Our preferred tokenization pathway is the “direct” (or deterministic) approach** whereby the environmental claim underpinning a VER (Verified Carbon Unit) is transferred from the carbon credit to the token upon tokenization. Being intangible assets based on verified data make carbon credits a good fit for automated status recording on a public blockchain, which is why we favour a programmatic approach in both the direct and custodial model. We assume that when a tokenization pathway is enabled, the states ‘tokenized’ and or ‘immobilised’ will be introduced in Gold Standard’s registry.



**Tokenized carbon credits (TCO2s) on Toucan's platform carry all the relevant project and vintage-specific attributes, whether tokenized through a direct or custodial model, and can be transferred between accounts as well as retired to consume the underlying environmental claim.**

The Pool module can be used to create **baskets of credits that share a set of predefined criteria**. The Nature Carbon Pool, for instance, only allows for credits generated through nature-based methodologies. Matching credits can be exchanged for pool tokens (like NCT—Nature Carbon Tonne) and pool tokens can be swapped back into project and vintage-specific TCO2s at any point in time.

Since its launch in October 2021, **we believe Toucan has demonstrated the potential** that a tokenization infrastructure platform can bring to the Voluntary Carbon Market:

### **Participation.**

Toucan has established an easier route for individuals and small organizations to purchase and sell voluntary carbon credits either to offset their emissions (companies) or monetize their originated credits (project originators/developers).

### **Liquidity.**

Toucan's infrastructure platform increases the overall volume of value as well as the volume of transactions in the Voluntary Carbon Market. This enables aggregation on both the supply and demand side. This provides the foundation for greater financing power as retirements occur and better forward financing solutions based on robust market price signals are established.

### **Matching and Price Transparency.**

Toucan's pools enable curation and standardization/ commoditization of credits, thus enabling deeper liquidity and better price discovery. The pools also allow project developers to convert their project-specific credits into a more liquid asset.

As with many market innovations, the initial experience with Toucan's infrastructure platform, similar to other tokenization platforms, has highlighted areas where **modifications and improvements are warranted**, especially as the overall market starts embracing token-based credits and it becomes an institutionalised product implementation.

Throughout the history of the Voluntary Carbon Market, stakeholders have identified program design flaws and taken appropriate steps to correct them through an iterative, participatory process. For these reasons, **Toucan welcomes both this Consultation** and any related consultations taking place under the auspices of other institutions, such as the International Emissions Trading Association's initiative to develop a Code of Best Practice for Digital Climate Markets ("IETA Code of Best Practice").

Toucan is actively participating in these consultations as we strongly believe that the substantial benefits of tokenization platforms for the Voluntary Carbon Market will be better realized if Gold Standard and other standards establish robust requirements for such platforms.



## 1. General Questions:

# 1.1

**Do you agree that Gold Standard should explore and enable organisations to create digital tokens representing Gold Standard credits, using blockchain technology? Why?**

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Yes, Toucan believes that blockchains-based carbon market infrastructure and the tokenization of carbon credits offers great potential, which can be summarised as:

- A Improved market experience:** Via the tokenization of VERs, Toucan's infrastructure will **improve the supply and demand experience** for market participants. Suppliers can directly transact and sell credits without additional layers of intermediaries while buyers also encounter less friction and risk. With more transaction transparency will come better price discovery, thereby supporting the growth of the VCM.
- B Market expansion:** Tokenized carbon is **programmable** and can be integrated into IT and web3 projects, **creating higher utility** and new use cases for carbon. 188 projects are building on Toucan's infrastructure, opening up the possibilities for carbon as a green building block and paving the way for microtransactions.
- C Deeper liquidity:** In an open and composable ecosystem, **tokenized carbon credits can be pooled** and used as collateral in a wide range of decentralized finance (DeFi) applications. Users can lend and borrow, stake, or they can turn to a liquidity provider (LP) for specific pools in return for yields. These new sources of demand can help carbon markets scale.

# 1.2

**Do you consider there to be potential advantages or disadvantages for your organisation if this were enabled?**

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We consider this a great advantage for our **organisation** as well as the high-momentum, **high-growth ecosystem** that is building around and on top of us. Toucan has pioneered the tokenization of VCM standard credits independently. Establishing an authorised process with the standards, which enables a bi-directional bridge, will represent the next phase of on-chain carbon markets in which we expect to see

the engagement of **institutional players** - brokers, capital providers and buyers. By enabling tokenization, Gold Standard will **accelerate the on-chain carbon market** in scale and integrity, increase the flow of capital into existing and new climate mitigation projects and proliferate the transparency movement of the voluntary carbon market.

# 1.3

## Would you like to share any additional comments not covered by questions included in this consultation?

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We believe it is important to highlight that many issues in carbon markets today originate from conflicts of interest or misaligned incentives.

Thus, it is crucial to consider how best to establish the **cleanest structure and landscape** of roles for different market players. It is our position that the underlying infrastructure of the carbon market, which we believe will be blockchain protocols, should be operated by pure play organisations. Hence the role of a **tokenization protocol should not be mixed with a marketplace/broker model**.

This is an important point to underline in this consultation in particular, as the pre-conclusion of starting with a custodial model, possibly with manual processes, favours those players that have a marketplace / 'exchange-like' setup who from our point of view are not be the first choice of entities by which the infrastructure backbone of the market should be

operated. While Toucan believes it can operate a secured/custodial tokenization model with manual steps in the tokenization flow, we need to underscore that this **would not represent an efficient and de-risked approach**.

**Toucan is ready to establish the required setup** and establish a custodial account, while it continues to advocate for a direct tokenization model under both the reference and native tokenization pathways. Since both Gold Standard and Toucan Protocol Association operate from Switzerland, the operating model can mirror the setup of existing brokers and traders like South Pole, who currently operate accounts in which they 'take custody of credits' on behalf of buyers that buy and hold credits with South Pole until they eventually retire them at the end of the year as part of their Neutrality Claim making.

# 1.4

## Do you consider there to be uses of blockchain technology that should be distinguished and treated differently from others?

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Yes, several distinctions need to be made, mainly between Public vs. Private Blockchains & Ledgers:

Public blockchains provide a **novel approach to establishing transactional certainty** without having to trust opaque blackboxes of infrastructure operations. Public blockchains are built in the open, are **subject to constant scrutiny**, and as a result, lead to improvements which are highly secure, efficient, reliable and market-tested, settling billions US dollars of transactions daily. The best example for these characteristics is, in our view, Ethereum.

**Every transaction can be traced, is unique and immutable.** The integrity of this value proposition is safeguarded by a consensus network of thousands of participants, with billions of dollars of value at stake, as reflected by the dominant “Proof of Stake” consensus mechanism. This setup provides the highest form of transactional transparency and integrity any ledger technology has produced today.

**In contrast, private blockchain technology typically consists of ...**

- A** Potentially limited number of validators/nodes thus potentially less secure
- B** Limited scalability
- C** Centralized authority and limited transparency, requiring more trust from its users and stakeholders

Blockchain networks and ventures, in case they are requesting authorization to tokenize, should be reviewed for conflict of interests with their business model and setup, which by a regulator could also be considered market manipulation. As mentioned above, we believe conflicts of interests should be avoided and the best way of doing so is to **stick to pure play operating models**. A tokenization platform should not fully control the pools, nor its supply flows, as this would allow it to manipulate the price just by its own actions.

# 2.1 Model

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Initially, Gold Standard proposes to require any organisation intending to create digital representations of Gold Standard credits on a blockchain to establish a 'custodial' registry account within the Gold Standard Impact Registry. The custodial account is a model currently used by organisations listing credits on a third-party exchange, in which an account holder manages – or takes 'custody' of – credits that are owned by other organisations or individuals, for the period that they are listed on the third-party platform.

In the case of tokenization, the organisation intending to create digital tokens representing Gold Standard credits on a third-party platform would be required to **establish a custodial account**, in which the original credits would be housed for the duration that they are represented as a digital token.

Any VERs that the organisation or the organisation's participants wish to 'tokenize' would need to be transferred into the custodial registry account prior to their tokenization and held (unretired) in that account for the full period that the VERs are represented as digital tokens on the organisation's separate platform.

By establishing this registry account, the organisation would also be required to sign and thereby take responsibility for compliance with Gold Standard's General Terms and Conditions and Registry Terms of Use. **Gold Standard considers the model described above to be a short-term solution**, while other models are developed. Over the longer-term, Gold Standard may explore two further models:

- 1 The creation of an **Application Programming Interface (API)** or similar software interface connected to the Gold Standard Impact Registry, which enables a more direct tokenization of VERs on a third-party platform and allows for automated two-way

communication between the Registry and third-party platform.

- 2 The **direct creation of on-chain representations** of Gold Standard credits by Gold Standard, which is sometimes referred to as 'native tokenization'.

## Do you consider the custodial account model to be workable in the short-term while other solutions are explored?

Toucan considers custodial account models **workable under certain conditions and with disclaimers** that make human error risk transparent. From our point of view, a custodial & manual model (see under (1) custodial & manual in the definition below) is **not sustainable long term**. It can be workable for a period of time, if a minimum level of adjustments and automation are implemented, in line with what is specified in IETA's best practices on Digital Carbon Markets.

Toucan Protocol differentiates the tokenization models along two dimensions: Control and Interaction.

### Control:

With control we refer to how accounts are involved in tokenization, similar to the definitions of custodial



or non-custodial in Gold Standard's concept. This specifies the **entity owning and being responsible for the account** that holds the to-be-tokenized or tokenized credits, in particular in whose domain of responsibility carbon credits lie while being in the tokenized state. It does not refer to how credits are tokenized operationally.

- **Direct:** User accounts hold credits in 'tokenized' state while in that state they no longer represent ownership. The representation of ownership has **moved into the representing token**. Credit states and transfers can only be updated if they correspond with an on-chain transaction and need to be executed in / from these user accounts, manually by users with the right permissions or programmatically by code.
- **Custodial:** Account operated by an entity other than the standard, e.g. the tokenization platform provider. The entity that operates this account keeps up the service promise, that a "custodied" credit will not be moved unless there is a de-tokenization or retirement event. It promises that a credit can be re-activated when the matching carbon token has been marked as de-tokenized on-chain. Until de-tokenization, the ownership is represented by the token. The account operator promises further to retire the matching carbon credit following an on-chain carbon token retirement by changing the state to 'retired' in the standard registry.

## Interaction:

With interaction, the transfer and retirements of credits and tokens are addressed, in particular the synchronisation of information attached to these transactions. To us, the execution of these transactions is conceptually not depending on account ownership but relates to infrastructure functionality.

- **Manual:** Actions need to be performed by a user or administrator in line with on chain transaction requests and states.
- **Programmatic:** Actions are automatically performed by software that check alignment

with on-chain requests and states.

## With the above categorization, four configurations of potential tokenization models can be distinguished.

### Custodial & manual

Credits are moved to a custodial account for tokenization purposes; interactions with blockchains, including tokenization, de-tokenization, retirements, etc., are administered by a human operator, who is responsible to sync the states of ledgers.

### Custodial & programmatic

Credits are moved to a custodial account for tokenization purposes. Any interactions with blockchains, including tokenization, de-tokenization, retirements, etc are conducted by reviewable code. Synchronisation of information between ledgers (e.g. retirement details) is exchanged via APIs and governed by reviewable code. Even though the custodial account holds the credits, account owners of tokenized credits cannot interact with tokenized credits other than via reviewable code. This configuration is deterministic.

### Direct & manual

Credits remain in the account of their legal owners for tokenization purposes, interactions with blockchains, including tokenization, de-tokenization, retirements, etc., are administered by a human operator, who is responsible to sync the states of ledgers. In this case the operator would be the account holder themselves, which poses great risk. This configuration is unworkable in our opinion.

### Direct & programmatic

Credits remain in the user's accounts during the tokenization phase showing the updated state 'tokenized'. During that period, the fact that the credits sit in a specific account, does not mean this account owns them if they show the state 'tokenized' but ownership is represented by the tokens and credits have initially been tokenized out

of the respective account where they sit as 'tokenized'. Any interactions with blockchains, including tokenization, de-tokenization, retirements, etc. are conducted by reviewable code. Synchronisation of information between ledgers (e.g. retirement details) is exchanged via APIs and governed by reviewable code. This configuration is deterministic and represents our preferred model.

**To identify the areas where minimal adjustments are needed, it's helpful to look at the different life cycle stages of tokenized carbon credits**

## Tokenization & De-tokenization

Custodial tokenization should not be implemented working only with the two existing states of 'active' and 'retired' but rather with the **introduction of new states of 'immobilised/tokenized'**. Hence rather than establishing work-arounds and repurposing existing features of the registry, we recommend these adjustments and introductions.

- **Add new states:** 'immobilised/tokenized'
- Enable accounts for **'immobilised/tokenized'** credits. Each tokenization provider operates its own account. No mixing between platform operators should occur on the standard registry side.
- **Add field:** 'wallet address' to account information of GS account holders and include this data point in GS's KYC process
- **Add message field** to transfer function for transfers of credits for the purpose of tokenization, to enable programmatic validation of tokenization execution (similar to the functionality of retirement messages for a retirement transaction in GS's registry)
- **Make new data fields public**, such that any user can run an analysis and verify that the 'immobilised' credits in the custodial account match the tokenized credit portfolio.

With these and potentially other small additions or changes, depending on a joint requirements

specification process, a custodial & manual model can be run for a **limited amount of time**. Operations can be optimised by processing tokenization and de-tokenization requests in batches and by introducing minimum thresholds for tokenization and de-tokenization. **We want to make clear, however, that these measures create inefficiencies and are hurdles for significantly scaling the VCM, they should only be seen as temporary workarounds.**

## Retirements:

In the case of retirements, we believe that **programmatic interaction is necessary** in order to avoid substantial risk. Retirement marks the moment in the credit's lifecycle of claiming the environmental benefit. The integrity of this operation is of ultimate importance to the incentive system the voluntary carbon market has established. Any **discrepancy introduced by human error** when copy-pasting retirement information or selecting serial numbers is **detrimental and bears potentially high impact**. Additionally, in Web3 environments it is reasonable to expect a high frequency of transactions, including smaller-value retirements. These two aspects lead to a risk assessment of high risk (high impact, high likelihood of risks materialising due to many repetitions) when manually synchronising retirement information between ledgers.

We therefore strongly recommend to amend a custodial and manual model with at least an **API-based synchronisation** of on-chain and off-chain retirement information. We understand there are limitations in capacity and functionality of the existing system to easily provide this functionality, and **we would like to offer support** - in developer capacity or budget - to build out this API-functionality short-term as it benefits the integrity of the on-chain carbon market.

While we could also run a custodial approach as understood by Gold Standard to date, we prefer to

advocate that this solution should not slow down other models that have inherent benefits (Direct & programmatic, model 4). The full benefits of direct tokenization, and with that the deterministic nature of tokens, depends on a certain level of automation which we don't assume to be there in the short-term. As stated above, we would prefer to invest in the automation of the joint system, even addressing functionality on the registry side, by providing required engineering capacity, over operating the system manually for too long.

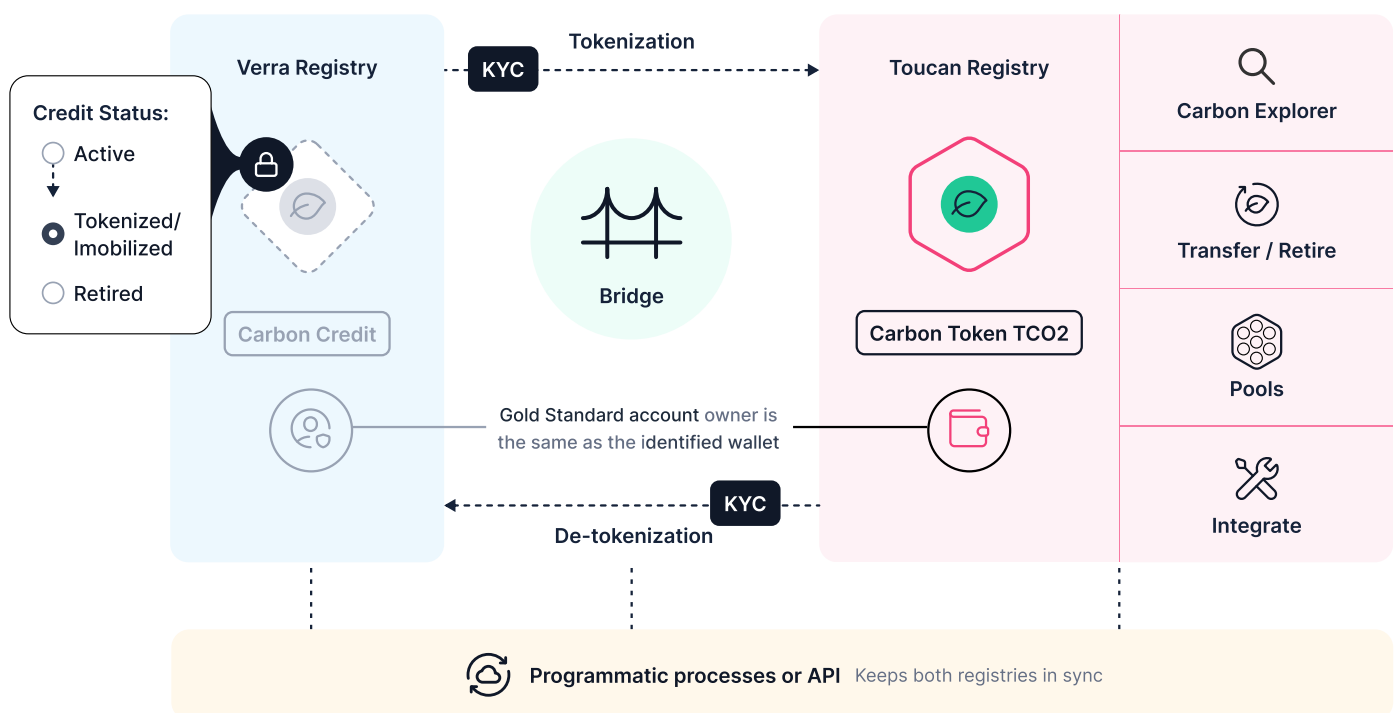
We believe that the best model to implement is a model in which the custody of credits address ownership states, but where interaction between Gold Standard's impact registry and tokenized carbon credits on-chain is executed **programmatically and deterministically** (see model 4 in definitions above).

## Do you consider it appropriate for Gold Standard to explore 'native tokenization' in the future?

Yes, we consider this appropriate, if done in the right way. Native tokenization should be implemented on public blockchains by application layer and **pure play infrastructure** operators that offer the standards a custom approach. Native carbon tokens should be **multi-chain assets**, able to travel where they find most utility and demand across the most thriving blockchain ecosystems.

Native tokenization would allow for a different architecture and process. Assuming it is initially a central process whereby the standards send the tokenization signal, after VBBs verify the data from the monitoring reports, it is likely **less complex than a conversion process**.

At the same time, a number of **legal and compliance questions** need to be addressed in the relevant jurisdictions, e.g. how the token issuer role is framed in the model of native tokenization. When a standard body issues credits directly as tokens, on a protocol like Toucan it is categorised as the token issuer. Token issuers need to ensure compliance, which in the case of a Swiss-based entity can be achieved on the back of Toucan's



compliance consultations with FINMA.

In the case of Gold Standard, it is possible to build on the legal guidance that Toucan has obtained, which is also being used for the consultation with the Swiss regulator FINMA, to obtain regulator feedback concerning the relevant tokenization

operating models. Toucan's legal advisors expect Toucan to receive a **'Non-Action' letter**, which states that Toucan Protocol's tokenization platform, incl. the bi-directional bridges implemented in a joint system with the carbon standards, does not fall under a special compliance regime that requires oversight.

## 2.2 Holding, retirement and reporting

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To support transparency and the avoidance of double counting, and to enable Gold Standard to continue to effectively manage information related to credits it has issued, there are certain responsibilities that organisations creating digital tokens representing Gold Standard credits will need to take.

Gold Standard proposes to require that organisations must:

- 1 Ensure that any VERs retired or cancelled in full on a third-party platform (referred to as 'burning' on some web3 platforms) must be irreversibly retired on the Gold Standard Impact Registry with no undue delay.

**Yes. This requires an appropriate API in the direct model or an automated execution in a custodial model.** In a custodial model with manual execution of transactions by administrators, undue delay cannot be avoided, which is why Toucan Protocol recommends automated, API-based execution of synchronisation of information.

- 2 Provide an option for entities to 'de-tokenize' GS VERs, ensuring that the digital representation of the GS VER is irreversibly cancelled, and that the original GS VER can be transferred and retired by account holders within the Gold Standard Impact Registry without a risk of double use.

**Yes. This irreversible cancelling can easily be**

**verified and reported on-chain** and is an inherent step of any de-tokenization process. We recommend implementing a programmatic approach safeguarding the irreversible cancellation of the digital assets prior to interacting the original GS VER in the impact registry. Especially at larger scales and frequencies of tokenization and de-tokenization this is fundamental to the integrity and performance of such processes

- 3 Ensure that digital tokens representing Gold Standard carbon credits created on a blockchain-based platform contain sufficient publicly available information for third parties to clearly associate the digital representation with the original carbon credit in the Gold Standard Impact Registry. We propose to require that organisations include a link to all relevant information listed on the Gold Standard Impact Registry via the unique URL for the credit block, and/or include at least the serial number, vintage and associated project ID for all carbon credits represented as digital tokens on their platform.



Toucan Protocol proposes to establish this direct link and representation on a batch-level, meaning that a serial number range is tokenized as a batch of credits. Toucan represents batches of credits as NFTs, with each one containing a) a precise serial number and b) a link to a vintage NFT, which by association links the batch NFT with a project NFT. This provides sufficient linkage between tokenized credits and all relevant underlying project and vintage information, while preserving fungibility of credits within one project. Toucan has designed and implemented such functionality and can tailor it to the GS specific implementation as requested.

- 4 Report at least quarterly to Gold Standard with information on:

I. VERs that the organisation has represented as a digital token, including as a minimum information on the serial number, vintage and associated project ID

II. VERs that have been retired or cancelled on the organisation's platform, including as a minimum the same information.

Yes, this is possible. Actually Toucan's ambition is to provide a higher, real-time level of transparency on all the data-points generated on-chain. Toucan would also recommend to enable similar transparency on Gold Standard's impact registry for any custodial accounts used for tokenization purposes, by making their contents and transactions public and comparable to on-chain records.

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## Questions.

### Do you consider these proposals to be workable and proportionate?

Yes, as per our responses above we consider these approaches workable if they can be built with sufficient levels of **automation / programmatic** processes.

### What do you consider to be an appropriate timeframe in which retirements must be made on the Gold Standard Registry, following their retirement on a third-party platform?

Toucan Protocol considers **real-time synchronisation** of on-chain and off-chain retirements with **latency of significantly below 5 minutes** the only long-term appropriate service level. A fully manual process in a custodial & manual model (see model 1) would introduce significant risk, intransparency and low performance. A process like this would be able to process 2 batches per day, hence at max a 12 hr delay. Additionally it would need to limit the minimum transaction size in order to keep the

amount of transactions low. This scenario can be thought of being applied in a test environment or as a fallback to enable tokenization with a very short term interim solution of manual retirements.

### We are aware that some organisations may wish to create and market tokens that represent fractional portions of one carbon credit. Do you have experience or ideas for how requirements may need to vary in such cases, for instance related to retirement in the Gold Standard Impact Registry?

We would recommend to allow fractional retirements on-chain and maintain the synchronisation at the **integer value level**. However in a custodial approach as an initial model that keeps the environmental value of the credit within the source registry, this is more challenging than in the API supported direct model, where the environmental claim is fully linked/embedded in the token.

Two workable scenarios include:

- 1 The enabling of fractional retirements in the source registry itself, by, e.g. amending serial numbers with pre- or suffixes indicating kilogram or tonnes
- 2 Requiring tokenization providers to build an aggregation solution and handle fractional retirements on-chain and rolling up sub-tonne amounts up until one tonne has been reached and can be retired with the existing infrastructure

**Toucan Protocol would be more than happy to work with Gold Standard on either of those or other solutions that fit into the reality of existing infrastructure and governance requirements.**

## 2.3 Pooling

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**Several organisations creating digital tokens representing carbon credits apply the practice of ‘pooling’, under which carbon credits that meet certain eligibility criteria are pooled together and represented by a generic token rather than a token that is specific to an individual carbon credit.**

An example is the Base Carbon Tonne (BCT) created by Toucan.\*

This is broadly similar to the use of contracts on traditional exchanges, such as the Global Emissions Offset (GEO) created by CBL.

Gold Standard is mindful that by the nature of pools or contracts, carbon credits entered into the pool or contract would all be expected – in the absence of new innovation – to attract the same price. If Gold Standard credits were pooled with credits from other standards, this may therefore be disadvantageous to many projects registered with Gold Standard, if they are currently able to sell credits at higher prices. At the same time, Gold Standard understands that the ability to sell credits into pools may also be attractive to some project developers.

Gold Standard is inviting views from stakeholders on whether it should apply restrictions on the ability of organisations to pool Gold Standard credits with credits from other standards and, if so, the nature of these restrictions.

Before we go into the questions we would like to share a slightly different view on the above statements of the introduction. While it is correct that BCT was launched on Toucan’s infrastructure, Toucan did not set the pool criteria. That is not our intended role in this process.

For BCT, the actor behind the acceptance criteria was Klima DAO. Our other pool, NCT, was defined by a group of stakeholders, incl. Toucan, some of which provided initial launch supply and liquidity.

We appreciate that it could be a branding or pricing concern in pools linking credits from multiple sources, but this can be mitigated by the curated selection of pool governance partners. Market behaviour will solve for the rest, especially when detokenization becomes an option. To use a

hypothetical example of an existing pool, if the acceptance criteria for NCT expanded to include Nature-based Gold Standard Credits the reality is that the utility is expanded. If NCT was trading

at less than Gold Standard prices, credit owners wouldn't choose to pool unless they wanted access to quick liquidity. It would not negatively impact the overall project pricing.

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## Questions.

**Do you think that Gold Standard should consider restrictions on the ability of organizations to pool its issued credits with credits from other standards. Why?**

Any limitation of utility for digital assets and their application in products that are yet unknown needs to be **carefully balanced** by mitigation of (reputational) risk and allowing for opportunity. Commodity pools and other applications of financial mechanisms that capitalise on fungibility have led to a more dynamic market and improved market efficiencies. This has created incentives for direct investments into carbon markets that were flowing into other domains before. Toucan fully understands and respects Gold Standard's need to protect the integrity of its brand and the values it represents as a cornerstone of the trust that is being bestowed on the carbon market by investors. We have a design we are planning to implement as part of the next generation architecture, that we are happy to present as a next step

**If the answer to the above question is yes, do you have views on how any restrictions could operate?**

The options for placing restrictions could be:

- **Policy-based:**
  - **Upfront definition** of which other credits GS credits can or cannot be pooled with.
  - **Labelling:** Pools can get label after GS reviews

acceptance criteria

- **Commitment-based:**
  - Tokenizations platforms **commit to not launch** pools without the consent of the standards, whose credits are listed in the acceptance criteria.
  - Tokenization platforms can act upon request of standards, to **intervene with pool operations** in case of violations of any terms of use.
- **Governance-based:**
  - **Gold standard participates** in governance of protocols, which will also sign-off on pool launches

**It is important each of the above listed restrictions come with operational and potential legal implications as well as operational obligations that should be carefully considered.**

We are prepared to discuss these options and jointly identify the best approach that factors in the capacity to live up to them by all parties involved. We expect a roadmap to emerge that advances these governance mechanisms as the capacity on the standard side and implemented technical functionality evolves.

**Would you like to share any additional comments on this topic?**

We can't stress enough that pooling as an application of tokenized, digital assets, should be seen as a **huge opportunity** rather than a threat. While risks naturally exist, they are greatly outweighed by the opportunity that liquid, high-efficient markets and carbon-based products present. Deep and sincere collaboration

in designing governance mechanisms between incumbent standards and Web3 organisations is absolutely pivotal to minimise the remaining risks of pooled assets. **We appreciate the effort Gold Standard is already showing in this regard.**

While we understand the origin of the questions on pools and potential restrictions, we suggest jointly reviewing the options and mechanisms available to the different actors - standards, tokenization platform and pool operators/curators - in the system and then determine where best to place restrictions and other governance mechanisms.

**Toucan's pool architecture Version 2, its pool governance process and the new Carbon Explorer can establish by default or optionally:**

- Mechanisms that incentivize **high quality** credits to be pooled
- **Explanation and education** how pool pricing works and what credit suppliers need to expect and be aware of
- **Co-governance** of pools by the standards
- **Pool transparency** through the Carbon Explorer, which allows every user - buyers and credit suppliers - to easily understand the pool composition

It should be noted that credit suppliers don't pool if it makes no sense for them. Some actors pool to hold or provide liquidity, some actors pool to sell the obtained pool tokens right away. These actions are only done, if they make commercial sense for the token holder at the moment of execution.

## 2.4 Due diligence

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Gold Standard already requires all organisations intending to open and manage an account in the Gold Standard Impact Registry to undergo Know Your Customer (KYC) checks, involving the provision of documents related to the organisation's incorporation, management, the nature of its business and how it intends to use its registry account. As a minimum, Gold Standard will require all organisations intending to create digital tokens representing Gold Standard credits to fulfil these existing requirements.

Gold Standard is though mindful that the organisation creating an on-chain representation of a Gold Standard credit will only represent the first layer of interaction. In some cases, other organisations may then create derivative tokens or other crypto-assets based on the original representations, which would not be subject to these KYC checks conducted by Gold Standard. Considering the ability for entities to act anonymously when using blockchain-based platforms and cryptocurrencies, this may introduce

either real or reputational risks for Gold Standard and its stakeholders. At the same time, Gold Standard is mindful that secondary due diligence checks are not required in other cases, where credits are transacted without the use of blockchain.

Gold Standard is therefore seeking views from stakeholders on the extent of the due diligence requirements that should be introduced in cases where organisations intend to create on-chain representations of Gold Standard credits.



## Questions.

**Is it sufficient for organisations intending to create original on-chain representations of Gold Standard credits to undergo our existing KYC checks, or should further due diligence requirements be introduced? If so, for whom?**

Existing KYC checks are a good starting point and should be the anchor, but it would make sense to add crypto related data collection to the process, mainly **wallet address data**.

Toucan seeks to find the best joint system for users and other stakeholders that would like to tokenize credits and operate on blockchain-based infrastructure. Therefore **additional steps and requirements** should be attached as seamlessly as possible to existing processes that users are already familiar to go through. Since tokenization and de-tokenization will be limited to standard account holders, we believe it is best to add crypto related data collection to the existing KYC. This mainly entails the link of a clear identity with a standard account and wallet addresses that are being used to conduct crypto transactions.

### Identification Procedures Options

**Tokenization.** As discussed above, Gold Standard has a cognizable interest in establishing the identity of an entity seeking to tokenize VERs for itself or for a beneficiary. Accordingly, we recommend that an **identification process related to tokenization is added to account holders**, either directly by Gold Standard or through a 3rd party that manages obtained data and issues a verification of identification. On that basis, we recommend that any authorized tokenization platform requires a verification of identification before giving access to its tokenization and redemption processes. In the case of identification performed by Gold Standard, the verification

status can be submitted through a whitelist or API. If delegated to a 3rd party, Toucan can implement a check for proof of verified identity via specialized 3rd parties, which after having completed the identification process, will provide the relevant web3 account with a portable ID in the form of an NFT token.

**Redemption / De-Tokenization.** Gold Standard also has a cognizable interest in actions that reactivate VERs in the registry through the redemption process. Therefore, we recommend that an **identification process is included in the redemption steps**. As with tokenization, this process could build off of Gold Standard's own procedures, as we assume that the redeeming entity already is an existing account holder. As such, web3 accounts would be either whitelabeled through an API or be provided with a NFT token upon having completed the identification process with specialized 3rd parties.

In Switzerland, the jurisdiction that Toucan operates from, **Toucan's setup and the classification of its tokens does not require reporting on AML** or sanctions list monitoring. However Toucan preserves the right in the Terms & Conditions of use of the Bridge that it has the right to block any web3 account that has links to sanctioned entities/individuals, as well as any money-laundering/terrorist financing links. The above implementation would enable Toucan or Gold Standard to do **ML sanction checks** at their discretion, which we consider a benefit.

**Do you think that Gold Standard should introduce requirements related to the due diligence checks that organisations creating digital tokens representing Gold Standard credits apply for their own users?**

Toucan users fall into different categories or segments. We believe it makes sense to include the bridge users, entities that hold a standard account and want to tokenize or de-tokenize - in

existing KYC processes that are adjusted to cover crypto related operations and clearance. Other user categories, like users that buy, trade, retire or stake carbon tokens should not be subject to any further requirements.

### Identification Checks to avoid:

**On-chain Transfers of Tokens.** For the reasons discussed above, Toucan recommends that Gold Standard **does not mandate** that authorized tokenization platforms implement identification procedures for token-related transactions occurring entirely on-chain—including transfers of tokens among web3 accounts and transfers of tokens into and out of pools.

**On-chain Retirements of Tokens.** We do not see any rationale for requiring an authorized tokenization platform to impose an identification procedure on an entity that **retires its on-chain tokens**. The retirement of a token does not create monetary value and therefore does not have associated fraud or money-laundering risks. Instead, retirement of a token creates reputational value and therefore is, by its very nature, a very public act. It does not occur in the shadows. For these reasons, Verra **should not** require identification procedures on entities that retire tokens on-chain.

### Are there examples from other sectors that you believe could be learned from?

Examples can be found in the carbon market, looking at how carbon credits are currently transacted in Web 2 platforms and e-commerce integrations.

- Users may be identified by the **Web2 platform**.
- The **service firms aggregate credit purchase** in a private accounting tool and settle on a monthly basis the accumulated carbon transactions and retirements in a batch format with the registries, or their internal carbon accounting systems.

- **E-commerce platforms do not share** the identity of the buyers with the broker / carbon retailer, nor are they sharing the consumer data and identity with the related standards of the credits being transacted.
- **Micro transactions are in demand** via API based processes and this should be translatable to the Web3 ecosystem. Within those, there is no user identification nor identity sharing with the standards nor is the operator required to report user identities around such transactions.

### Would you like to share any additional comments on this topic?

Toucan has no legal requirements in its relevant jurisdictions to perform KYC checks or implement **AML procedures** for the on-chain activities of the tokens it has issued to date. As discussed above, tokens issued by Toucan are neither securities, payment tokens nor stablecoins.

In addition, it is important to recognize that such procedures **impose transaction costs and complexity** on the tokenization service provider. That is why such procedures generally have been reserved for securities transactions involving large entities and large volumes—for which the risks of fraudulent activity (or money-laundering) are greatest. There is no justification to mandate extensive identification procedures that are comparable to AML regulations on publicly-accessible, decentralized, fully transparent and permissionless blockchain platforms when such procedures are not mandated for other entities that transact in VERs.

For a more in depth resource on KYC please [view our latest publication on this subject](#).

# 2.5 Sustainability

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The greenhouse gas emissions associated with the operation of blockchain technologies varies significantly from platform to platform. Blockchains using a 'proof-of-work' mechanism, which includes Bitcoin, can require significantly more energy and therefore may contribute significantly higher greenhouse gas emissions than blockchains using a 'proof-of-stake' mechanism.

Gold Standard is of the view that the sustainability of the blockchain matters, in the context of its decision to approve requests by organisations to create on-chain representations of Gold Standard credits. There is the potential for higher emissions, as well as reputational harm, by permitting the creation of on-chain representations using higher-emitting blockchain technologies, in particular considering that more sustainable alternatives exist.

Gold Standard therefore proposes introducing a requirement that organisations creating digital tokens representing Gold Standard credits must either:

- 1 Ensure digital tokens exist only on a blockchain that uses a proof-of-stake mechanism, or
- 2 In cases where the blockchain does not use a proof-of-stake mechanism, provide at least one

## Questions.

**Do you agree that Gold Standard should apply restrictions related to the emissions footprint of blockchain technologies?**

Restrictions regarding proof-of-work make sense, but beyond that we see minor sense in further restrictions. Other consensus mechanisms should go through an analysis by a third party.

independent, peer-reviewed analysis demonstrating that the blockchain technology has a direct emissions footprint (i.e., prior to any offsetting) that is significantly lower than those using a proof-of-work mechanism

(see question below on the benchmark for this).

In the future, Gold Standard expects that it would establish an approved list of blockchain technologies to streamline this process for applicant organisations.

Gold Standard invites views from stakeholders in particular on the workability of these proposals, the appropriate benchmark to set for the emissions footprint of blockchain technologies, and any existing third-party source of evidence on the emissions footprint that could be used to inform its approach and decisions.

We think the tokenization platform providers know that their use cases make **only sense on low carbon technologies** that take actions to be carbon neutral or negative. If there aren't any known analysis about a certain blockchain it can make sense to ask a tokenization platform to commission such analysis with a reputable firm, such as the Carbon Rating Institute (CCRI). We would advise for Gold Standard to work with such firms, so clearance and guidance can also be established pro-actively. In our experience, layer

1 blockchain operators would also be happy to sponsor such analysis to **make their ecosystem attractive** for the #ReFi community.

**Do you consider these proposals to be workable and, if not, why?**

**Yes, we think that Proof-of-Stake blockchains provide value-for-energy-investment as a leading paradigm currently.** We also believe, that Gold Standard should not limit itself from future evolutionary and revolutionary innovations in blockchain technologies by exclusively allowing one consensus mechanism such as PoS, but be open to other, proven alternatives, as proposed by Gold Standard

**Do you consider these proposals to be sufficient and, if not, why?**

We consider this approach to be sufficient to take up tokenization in a reliably sustainable manner today. We recommend to **include interoperability in the assessment** of the long-term sustainability of a blockchain ecosystem, as the lock-in into very narrow or private, proprietary solutions bar Gold Standard and its digital assets from benefiting from future innovation in energy-efficient solutions of a broader, interconnected ecosystem.

**Are you aware of, or would you recommend, a benchmark that Gold Standard could use to determine whether blockchain technologies have a sufficiently low emissions footprint for consent to be granted?**

We recommend working with or referencing the **Crypto Carbon Rating Institute (CCRI)** on assessing various blockchains for their suitability as base infrastructure for environmental market use cases.

## 2.6 Data security

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Gold Standard has measures in place to protect the security and integrity of data represented on the Gold Standard Impact Registry, and to prevent IT breaches. As is the case for all technology, Gold Standard is mindful of the potential for technologies used by third-party organisations creating digital tokens representing Gold Standard credits to be breached or for data to otherwise be at risk. This could be as a result of steps by malicious actors, or systems could also be disrupted by other factors, such as faulty design.

Gold Standard invites views from stakeholders on any requirements or safeguards that we may choose to put in place with respect to the security of technologies used by organisations creating digital tokens representing Gold Standard

credits. Gold Standard will also draw on information and recommendations provided by the Working Group on Digital Infrastructure and Open APIs, established under its Open Collaboration for digital solutions in carbon markets.

## Questions.

**Do you agree that Gold Standard should either introduce conditions or require information related to the IT security measures that an organisation is taking to protect data against breaches? If so, do you have views or recommendations on what Gold Standard should require?**

Yes we think both conditions and information should be required. The tokenization platform should **undergo audits** from reputable third party experts, and it is recommended that the audit results should be made public for independent analysis. It should also be noted that security needs to be addressed holistically, via analysis of the end-to-end flows spanning not just the tokenization platform, but also specifically how it interacts with the GS registry. Toucan is therefore happy to work with GS and its software partner(s) to identify risk across the complete system and define mitigation strategies.

Gold Standard should request from approved tokenization providers to showcase neutral, **third party audits** of the infrastructure planned to be used for tokenization of Gold Standard credits. Example of such audits can be found here: [Security - Toucan](#)

**What are the primary risks that you believe Gold Standard should consider when writing its requirements on this topic?**

Risks associated with the human factor in custodial, especially manually operated models, such as

- Human error
- Rogue employees
- Social engineering of key individuals with administrator rights
- Distortion of key individuals

**Are there benchmarks, good practice codes or similar reference points for IT security requirements that you would recommend Gold Standard following or taking into account?**

Here are some reference points that could fit in this context.

- [Security - Toucan](#)
- [PWC Switzerland](#), which includes former Chainsecurity



# 2.7 Permitted units

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Gold Standard has identified several types of credits that may require further consideration before it provides permission for them to be tokenized. These are:

**1** Planned Emission Reductions (PERs): PERs are issued to certain land use and forestry projects registered with Gold Standard, and represent expected future emission removals rather than verified, achieved emission removals. As such, PERs are not allowed for use towards offsetting claims and are not interchangeable with Verified Emission Reductions (VERs). Initially, Gold Standard is of the view that PERs should not be permitted for tokenization while a suitable approach and safeguards are developed.

**2** VERs authorised for use under Article 6 of the Paris Agreement: Gold Standard expects in the future to issue VERs that are associated with a Letter of Authorisation issued by the project's host

country, permitting the VERs to be used by entities towards purposes permitted under Article 6. Under rules adopted by the UNFCCC, governments will need to report detailed information on the use of such VERs, including their use purpose and the using entity.

At this early stage in the implementation of Article 6, Gold Standard is of the view that it is premature to permit the tokenization of VERs associated with an Article 6 Letter of Authorisation.

In both cases, Gold Standard envisages permitting tokenization with tailored safeguards in the future, as we are aware of organisations interested in creating digital tokens representing both types of units.

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## Questions.

**Do you agree with the proposal not to initially permit the tokenization of these categories of credit, until tailored safeguards are developed?**

### Planned Emission Reductions (PERs)

Toucan Protocol sees significant potential and value in the instrument of PERs and similar forms of ex-ante units. We do not perceive these units as credits but as **commitments, denominated in VERs**, to deliver ex-post credits in the future upon issuance of the corresponding VERs. We **would not allow** the retirement, including benefit-claiming, of such ex-ante units.

Furthermore, we recognize and want to emphasise the benefits that tokenization of PERs can bring, especially in the **operational and accounting domain**. Transfer and conversion of these units today functions manually and present significant hurdles that do not allow for mass-market adoption of these units, while introducing unnecessary lack of transparency.

Tokenized PERs can offer completely open, audited **safeguards against retirements & claiming**, automatic conversion into VERs upon signals governed by Gold Standard, and easy, efficient transferability from project developers

to their customers. Specifically, the latter two points provide great efficiency gains for project developers and reduce accounting efforts and associated cost.

### Authorised Credits

Projects that have received a **letter of authorization** from the host country are originating credits with additional attributes and requirements in their use, including higher transparency and data collection. Rather than posing a problem, tokenization of these credits provides the **opportunity to fulfil requirements** associated with authorised credits in a more transparent and future-proof way than upgrading legacy infrastructure.

Corresponding adjustments, which go hand in hand with letters of authorization, create necessity for large-scale, international, inter-governmental and inter-sectoral interoperability, especially around accounting issues such as double-counting. **Public blockchains provide the best option to real-**

**ize interoperability and transparency on such a scale.** Collectively, we should not seek to individually build proprietary registry solutions that each try to serve the same requirement for international accounting precision.

Therefore, we believe that by implementing the right requirements (e.g. retirement approval flows) on the ideal, future-proof infrastructure, Gold Standard can achieve **more utility and benefit for all carbon markets**, voluntary and regulated alike. Toucan Protocol is openly seeking to collaborate with Gold Standard on implementing the necessary requirements to handle authorized credits short-term and we are very optimistic on its realisation.

**Do you believe there are other types of carbon credits that Gold Standard should consider creating tailored safeguards for? If so, why?**

The above covers the starting points.

## 2.8 Reputational harm

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Gold Standard has existing provisions within its General Terms and Conditions and Registry Terms of Use that require organisations using and directly interacting with Gold Standard not to intentionally commit any act or omission that could cause harm to Gold Standard's reputation and goodwill, and that permit Gold Standard to take certain action in the event that its reputation is put at risk.

Gold Standard considers there to be specific potential reputational risks associated with links to cryptocurrencies that do not exist or are lower for other uses of Gold Standard and its credits. At the same time, our existing provisions related to

reputational harm are broadly applicable and therefore could be applied for the act of creating digital tokens representing Gold Standard credits, and any further activity derived from the original creation of these digital tokens, without change.

Gold Standard would be prepared to apply the powers that it holds under our existing terms and

conditions in cases where we assess our terms related to reputational harm have been breached.

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## Questions.

**Do you consider Gold Standard's existing conditions related to reputational harm to be suitable for the act of creating digital tokens representing Gold Standard credits?**

**If not, what amendments or additions do you believe are needed?**

**Would you like to share any additional comments on this topic?**

We confirm that Gold Standard's existing conditions related to reputational harms are also suitable for creating digital tokens representing Gold Standard credits. We would however put additional emphasis on the recognition that the **crypto ecosystem is grounded in decentralisation** and permissionlessness with actors of differing spheres of control and influence. The focus therefore should be also on clearly delineating and making explicit what those differing spheres of control and influence are.

We believe the responsibility of Gold Standard lies in ensuring the **integrity of the credits** and associated claims, and give guidance on the right use of credits in relation to Climate Action claims.

The responsibility of a tokenization platform like Toucan, which operates an Open Climate Registry across the different carbon standards and chains is to ensure that the **credit integrity is maintained and double-issuance as well as double-counting is prevented**, hence the 1t associated with a credit only exists once in its system. This includes the hosting of pools,

the bridging to other chains and retirements on Toucan or linked chains that have bridged Toucan carbon reference tokens onto their infrastructure. Furthermore tokenization solutions providers are responsible for the **integrity and security of their infrastructure**.

Beyond the above stated responsibilities, it is not possible to control other actors. As an example, where a Gold Standard credit is represented in a digital token and that token is freely traded, the behaviour of the holder of the token can not be influenced by Toucan or another Gold Standard partner.

We cannot be responsible for what we do not control. Gold Standard recognise this itself in relation to postings on its centrally managed website. "GSF is not responsible for any material posted on the Boards, or the accuracy of such material, by any third party.

We therefore suggest to amend one of the below provisions related to preventing 'reputational harm' specified in the Terms and Conditions of the GS Impact Registry with a statement regarding control: Add **'which is within Your control'** to the 3. provision.

- 1 Gold Standard and SC are recognized in the industry and with the public as independent service providers;
- 2 In conducting any activity in connection with or related to Gold Standard or SC, You will ensure that You maintain our high standards and reputation;
- 3 You will not intentionally commit any act or omission which is within Your control, that can or would reasonably cause or threaten to cause harm to

Gold Standard or SC, or the high standards and reputation of each;

- 4 You will undertake all commercially reasonable efforts to properly supervise your employees, agents, and representatives in a manner to ensure that they do not cause or threaten to cause harm to Gold Standard or SC, or to the high standards and reputation of each;
- 5 You will comply with these Terms and Conditions at all times; and
- 6 You will cooperate reasonably and in good faith with Gold Standard and SC to help maintain the high standards and reputation of each.

Toucan is open to work with Gold Standard and other standards regarding **guidelines for 'Builders'**, hence software developers that embed tokenized carbon credits into their applications and protocols. While Toucan also only endorses **mission-aligned partners** in their endeavours, it needs to be noted that full control is limited and Toucan also rejects liabilities for third party actions it has no control over.

## Next steps

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Gold Standard will carefully consider all responses to this consultation following its close on 28 October 2022. In the absence of any further complications, it then intends to adopt and begin operating a new process to begin providing consent to organisations intending to create digital tokens representing Gold Standard credits as soon as practically possible.

We consider the proposals included in this consultation to represent a first phase of a longer process of connecting Gold Standard with blockchain-based applications. It is possible that we will need to tighten restrictions in certain areas if we identify potential risks, which is a fact that organisations intending to create digital tokens representing Gold Standard credits should be aware of. At the same time, we also hope in the future to deepen partnerships and introduce new technology solutions in the future, to draw on the benefits that blockchain technology and its applications may bring to the carbon market.



Thank you for the opportunity to enter into this dialogue with you.  
We look forward to your response.

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