To whom it may concern,

we have really enjoyed and appreciated your considerations and discussions of different crediting mechanisms for land-based carbon removal. We ourselves have been dealing with this topic very intensively recently and came up with another potential crediting method that we would like to elaborate on and put up for discussion. We would like to do that with the example of a reforestation project.

One of the big factors that you have also mentioned frequently, is that each credit has a durability and must always be quantifiable around the value of 1tCO2e. This is also the basis on which the entire market has been operating so far.

In this context, the fact that the value of a credit is basically always one ton of CO2 – regardless of how the actual value of a credit develops – is confusing. If the actual CO2 value is lower, for example due to an incorrect calculation or missing measurement, this is not considered, nor is an increasing value. The value of a credit from a reforestation project, for example, would inevitably have to increase over time, provided the forest is not cut down or does not burn down or otherwise disappear, e.g., due to disease.

This is because as a tree grows, its biomass increases and so does the amount of CO2 sequestered. In this example, a simple differentiation is made between Crown Biomass, Stern Biomass and Belowground Biomass. Furthermore, a distinction must be made between tree biomass, non-tree biomass, soil carbon, harvested wood and litter, and lying dead wood. This must be accurately measured and observed over time, as you have rightfully pointed out. Otherwise you cannot calculate the actual value of a carbon credit.

We would like to propose an alternative to static accounting: dynamic carbon accounting.

Dynamic and static accounting of climate projects are two very different concepts on how to measure carbon impact. Carbon credits are based on static accounting whereas we should think more about how to establish a dynamic accounting. With this accounting method, the results can change over time. This means that the amount of tons per credit rises when the project performs well and declines if the project performs worse. This makes it ideal to express the volatility of nature-based projects.

Regardless of whether we are measuring statically or dynamically, we must fundamentally understand that we must record accurately how much carbon has been removed and stored over time by a climate project. This has largely been neglected in the voluntary carbon market which leads not only to false claims but also creates bad incentives in terms of quality for the entire market.

One first needs to understand that all carbon storage comes with a time value. That means that you cannot delete your emissions by offsetting them. They will only be temporarily removed from the atmosphere. Therefore, just as you should monitor your emissions, you should also monitor your negative emissions. Especially nature-based solutions can be quite volatile in the amount of carbon they sequester.

Our proposal: a new asset class

First, we might give these dynamic assets a new name to make it easier to differentiate them from credits. We can call them “carbon shares”. Carbon shares are intangible assets with an inner-stored CO2e value that dynamically adjusts with the amount of carbon being sequestered in the underlying project. If the carbon shares are held, the environmental claim can be accounted for by the owner. If the carbon shares are sold, the environmental claim moves to the next owner. At the start of the project, the value of a carbon share is zero ton of CO2e. If carbon is then removed from the atmosphere and sequestered, the CO2e value per share rises. (ex-post crediting)
If carbon is released into the atmosphere, the value of the share declines. We call this dynamic accounting. To fight greenwashing, ownership, transactions, and any changes to the projects underlying the Carbon Shares, these are stored on an immutable database that is always publicly accessible. This means that anybody can view how much carbon has been removed by whom at any point in time. This creates a win-win for buyers, sellers, and the planet.

The differences to carbon credits

Carbon shares and carbon credits both represent an environmental claim that can be bought in the voluntary carbon market. If they are high quality, they should also follow the principles of additionality, durability, and measurability. However this varies depending on the certification standard and project type. Other than that, there are a lot of differences between the two asset classes.

Accounting

The CO2e value of a carbon credit is always 1t of CO2e. It remains static regardless of how the underlying project performs. Carbon shares, on the other hand, can adjust their CO2e value dynamically depending on the amount of carbon sequestered in the underlying climate project. Consequently, the value could be anything from zero ton to the maximum capacity per share. Project types Because carbon shares can adjust their CO2e value, they make the most sense with climate projects that aren’t static in their carbon value. This is why carbon shares are ideal for nature-based solutions. Carbon credits can be found for all kinds of projects. In our opinion, they are a good choice when it comes to static climate solutions such as direct air capture (DAC).

Asset type

If you want to account for the environmental claim of a carbon credit, you have to retire it. After that, the credit becomes untradable. Therefore, a credit is a consumable, which loses its value as soon as it is retired (consumed). Carbon shares cannot be retired. They are an intangible assets that can grow in value over time, and you can sell them any time you want. We think that ending retirement is one of the biggest opportunities in the current design of the carbon removal market. It turns removals from a consumable to an intangible asset, leading to an end of the cost-focused environment we see today, towards a value-driven investment approach. Moreover, this would create the financial incentive to invest into high

quality projects with good durability. If you bought a regular share of a company for example, you would also want to make sure that the organization existed for a while.

Double counting: A push for transparency

Carbon shares address the issue of double counting by making sure that every change of ownership is recorded on a public asset registry. In our example above, this design would make the greenwashing of organization A not only transparent but also permanently recorded on a public database. Furthermore, it would be transparent how much carbon had been removed by each organization at any point in time because of a digital measurement, reporting, and verification (MRV) process that dynamically adjusted the carbon value of a share. Every time the carbon value is adjusted, the new value is recorded on the asset registry. This also makes it transparent when carbon that was previously sequestered in a project is released into the atmosphere again, which would result in organizations either having to adjust their climate claims or buy new carbon removals.

How can we guarantee transparency? Methodologies for measurement, reporting and verification

Eligibility analysis

The first step is providing the exact geolocation data of the planned project site. We at recarb use this data to do a forest/non-forest analysis to check which area of your project is eligible for planting. Afterwards, you will be given the results together with the expected carbon sequestration capacity of the project and a revenue projection. With that information, you can decide if it makes sense for you to continue the process.

Plantation design

The plantation design stage is important for creating an accurate carbon model for the project. We also want to make sure that the species planted reflect the natural ecosystem and are resilient to a changing climate.

MRV

With the plantation design completed, we set up the MRV process and do a baseline measurement of the project. We do of course understand the possibility that parts of the plantation design might change before planting, so we still offer the opportunity to change the models later.

IPO

Once the first carbon models are finished you can already prepare your initial public offering (IPO).

Regular measurement and monitoring

After the IPO of shares, the project and the dynamic value development needs to be monitored on a regular basis. (from seedlings monitoring up to biomass measurement with remote sensing. We use LiDAR data, satellite data and AI models to calculate the actual value).

How do we do that?

- the provision of a wide range of remote sensing data using active and passive satellite products from the Copernicus program of ESA, NASA, Planet and other providers.
- The creation of high-resolution imagery using "UAV (Unmanned Aerial Vehicle) technology to develop 3D models of landscapes. This is an important building block for our calculations of the sequestration performance of different soils, tree and plant species.
- The data acquisition and geospatial data transformation, spatial analysis, and data visualization using geographic information systems (GIS) and machine learning (ML) for mapping, reporting, and verification (MRV).
- The creation of geospatial models using artificial intelligence to understand and predict how spatial and system dynamics influence the behavior of different variables.

The regular measurement and monitoring of our projects takes into account the following processes and methods, among others:

1. **Collection of data for SOC (Soil Organic Carbon) calculations.**

2. **Calculations + estimates of above- and below-ground biomass** using a specially developed methodology. Additional application of a biomass algorithm, which requires the input of specific tree data combined with an in-depth study of species metrics. Accordingly, we are able to apply the algorithm to determine an estimate of aboveground biomass given all of these metrics. The final estimate will use a weighted average of biomass as a function of the area occupied by each species.

   Through the use of artificial intelligence, these methodological results will be improved over time as more reference and training data are input to better train the machine learning algorithm.
3. **Preventing and predicting illegal logging** using time series data from ESA's Sentinel-1 radar satellite combined with local expertise (knowledge and feedback loop from local experts) and artificial intelligence.

4. **Fire detection and risk assessment** We continuously check relevant alert ecosystems. As soon as we receive a fire or deforestation alert that is within the monitored area or nearby, an alert is generated and forwarded to field staff via a navigation app on their phone.

5. **Mapping pest and disease risk in timber.** We use two risk models to classify areas into 7 risk levels: 1 for very low risk and 7 for high risk. Both models use a

combination of Sentinel-2 imagery, ground information, weather data, and forest conditions to best determine where these beetles are likely to emerge.

The first model, run during the season, considers all parameters and focuses on soil properties. The model results in a classification where the largest area is assigned to risk level 1 and most outbreaks are assigned to risk level 7, as expected.

The second model focuses more on parameters as described in the scientific literature. The results are less clustered than the first model, but are pixelated and require aggregation based on pixels with the same value. This makes it easier to identify areas of high risk and seek them out in time to best control an outbreak.

We do hope that our proposal could become subject to a fruitful discussion and that our proposal might help you define the future of Article 6.4.