



climate cleanup



oncra

**Open natural carbon removal accounting
for climate innovators**



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Open Natural Carbon Removal Accounting Guidelines

www.oncra.org

Climate Cleanup Foundation

Amsterdam, The Netherlands

Climate Cleanup is a Public Benefit Organisation (PBO / ANBI)

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About this document

These Oncra Guidelines are the accounting rulebook for the Oncra Open Natural Carbon Removal Accounting framework, stewarded by Climate Cleanup Foundation and hosted at oncra.org. It contains the main definitions, rationale, norms, methods and procedures. A version control section can be found at the end of this document.

1. What is Oncra?

For thousands of climate entrepreneurs developing nature based solutions, Oncra is the world's go to carbon accounting platform that quantifies and verifies carbon removal with natural methods. Oncra is open source and builds trust through data driven empirical crediting processes. It pools project data, rendering the accounting process efficient. Oncra is effective for innovation, also because it operates without upfront costs for removers. Oncra aligns itself with the actual climate crisis, enabling distributive scaling in carbon removal towards gigaton scale.

Oncra is a framework cooperative stewarded by removers and investors as a social enterprise, and currently (see Article 4. Relationship between Oncra and Climate Cleanup) owned by a public benefit non-profit, Climate Cleanup Foundation, headquartered in Amsterdam, The Netherlands. Removers and the Foundation started Oncra as they experienced a need for efficient carbon accounting. Buyers and investors in removal credits experience the need for trustworthy assessments. Both groups have an incentive to keep costs low while keeping trust and efficiency high.

2. Definitions

Carbon Removal Credits (CRCs) are representations of carbon dioxide removed from the air or oceans and stored for a certain period of time. The Credits allow Removers to be compensated for their removal services. Carbon Removal Credits are carbon accounting units representing the actual sequestration of one metric ton of CO₂ (as CO₂ equivalent) from the atmosphere or oceans. Each Oncra removal credit represents a ton of carbon dioxide that is both removed and stored for at least 100 years, or is corrected for this timescale, as per IPCC convention this is considered to be as good as permanent.

Carbon Removal Certificate (CRC): a certificate issued by Oncra in accordance with the processes described in these Guidelines, mentioning the amount of Carbon Credits it represents, based on the tons of CO₂ removed by a Project or Chain of Remover or Sub-Remover.

Nature-based Solutions (NbS) use human-enhanced natural processes to both restore nature and remove and store carbon dioxide. NbS include carbon farming including construction crops like bamboo, seaweed cultivation, rock weathering, mangrove restoration, reforestation, and many more (see e.g. the Oxford University Nature-based Solutions Initiative). NbS help us solve both the climate and extinction crises, as they remove carbon while preserving biodiversity. Oncra is built on metrics for all four natural carbon sink areas, as implied by the International Panel on Climate Change (IPCC) in Assessment Report 6: Land, Oceans, Rocks and Constructions.

Carbon Removal Project or Project The scalable activities at a specific Location where Remover significantly removes CO₂ with Nature-based Solutions, as described in the Data Validation Statement on the basis of which carbon removal credits are created in the Ledger on the Remover's name, in accordance with the Oncra Certification Confirmation.

Carbon Removal Chain is a Project defined as a value-chain. As opposed to a Project that describes a stock limited over place and time, a Removal Chain describes a removal process constantly taking place in a value chain. Removal Chain certification enables Removers to sell credits on an ongoing basis, taking away the need to register a new Project for eg. each new planting cycle.

Credit Point is the place in the value chain where the removal is accounted for. This is not necessarily the actual place of physical removal, but the point at which long term storage can be reasonably expected (for example, the point at which a bio based building material is leaving a factory gate).

Data Validation Statement means the statement provided by Oncra to Remover confirming the validation of the Project including the data and assumptions under which the Project is validated.

Guidelines mean the processes and rules under which carbon removal is accounted for and CRC's can be issued by Oncra to Remover for a specific Carbon Removal Project or Chain. This current document describes the Guidelines. All contracts between parties around Oncra refer to and are built on these Guidelines. The Guidelines may be amended by Oncra. In the case of substantial changes, the Remover may hold on to the Guidelines as current at time of signing, unless an amendment to the contract is mutually agreed upon and signed.

Ledger: the registration bookkeeping of the CRC's issued by Oncra as published at the Oncra Accounting Platform

Location: means a plot or place where the Remover implements the carbon sequestration solution for which it receives a CRC and as further described in a Data Validation Statement. Each different Location is a separate project with a different data set and baseline.

Oncra Accounting Platform means the online platform, hosted online at www.oncra.org where Oncra facilitates the accounting of CRC's for Remover and Buyers, under the terms and conditions as mentioned in these Guidelines.

Carbon Removers are social entrepreneurs who develop and implement nature based methods for removing and storing carbon from the oceans and atmosphere. These scalable methods are found in four realms: on land, in oceans, with rocks and human constructions. The removers are for example seaweed farmers, carbon farmers growing construction crops like bamboo or hemp, builders using bio-based construction materials, and entrepreneurs developing enhanced rock weathering processes.

Sub Remover means a third party within a removal sector that wishes to request for CRC's for a Carbon Removal Project through Remover to Oncra.

Buyers are legal entities acquiring carbon removal certificates representing carbon credits. Buyers can be individuals, companies, or government entities. As Oncra itself does not provide marketplace services, the legal relationship between Buyers and Oncra is not a financial one. Oncra provides Buyers with access to the Ledger and certificates that were bought, but the marketplaces actually pay Oncra for its services at the moment a credit is sold.

3. Foundation

Relationship between Oncra and Climate Cleanup Foundation

Oncra was conceived of by Climate Cleanup Foundation and its related entrepreneurs who remove carbon with nature. Oncra is primarily an independent Framework without specific legal status: a commons based set of carbon accounting rules. Built on the Framework, Oncra operates an independent verification service. Currently the verification service is legally operated by Climate Cleanup Foundation. At the latest when 10 million metric tons of CO₂ are verified, Oncra as a verification service will be a social enterprise legally separated from Climate Cleanup Foundation. Until that point independence of review is provided by the practice of remunerating the verification team per assessment, instead of per carbon credit or on a per project basis.

Future-proof business model

Oncra thus operates as a governmental service, at a fixed fee. Climate Cleanup Foundation pays Oncra upfront for assessments, and takes a percentage of maximum 7% on the first sale of credits issued on the ledger to recoup assessment costs. Any remaining balance is 100% invested in climate innovation, both in the Oncra framework and in new and better Nature-based solutions removing carbon with nature. A balance between low verification costs for Removers, optimal reliability and innovation is ensured by discussions in a yearly meeting with Removers and oversight by the Climate Cleanup Foundation's board.

4. Framework Structure

Oncra is built around four financial metrics, developed with financials, frontrunners in carbon removal and local governments. These metrics form the core of the Oncra sectoral accounting protocols for each removal sink area: Land Stored Carbon, Ocean Stored Carbon, Rock Stored Carbon and Construction Stored Carbon. The Sectoral Carbon Removal Accounting Protocols (SCRAPs) are built on the general principles and guidelines set out in this document. The SCRAPs provide sector specific guidance on eligible removal processes, system boundaries, the point of measurement of removal in the value chain ('credit creation'), the calculation and quantification of the removal, and the Measurement, Reporting and Verification (MRV) needs including minimal needed proof and evidence. The Framework Structure is depicted as an accounting stack in Figure 1.

Oncra thus is not another standard, but rather a 'standard of standards', a framework facilitating removers and buyers while combining the best and most effective carbon accounting practices. Oncra integrates existing 'Methods' as developed by CDM, Gold Standard, Verra, Puro and others with the financial PCAF standard, the emerging European Commission carbon removal credit guidance and GHG Protocol. Innovation is facilitated by working with trusted carbon data innovators. Oncra is developed by removers collaborating in Climate Cleanup Foundation, in an ecosystem of partners like a bank and regional

governments. Oncra is a removal accounting framework operating in an open, transparent, effective, affordable, self-learning and entrepreneur/remover centred way.

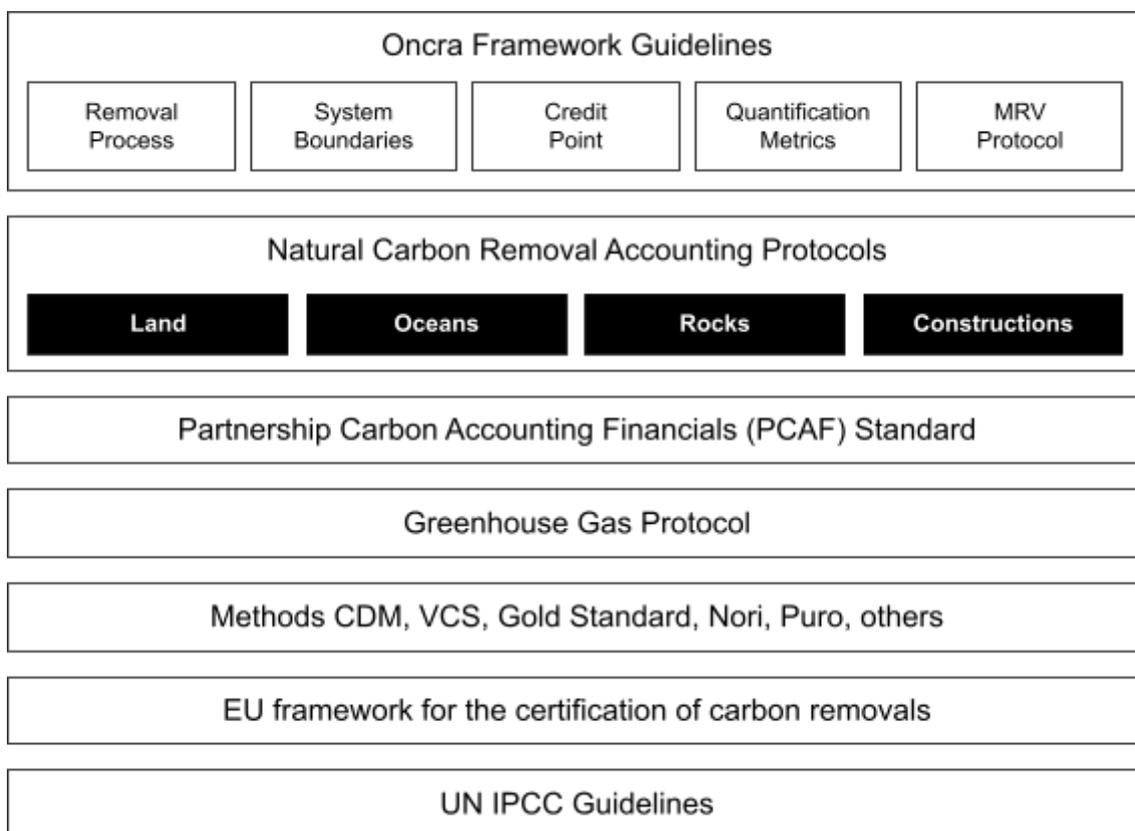


Figure 1. The Oncra Framework accounting stack

The Oncra Protocols specify for each removal realm the following framework guideline elements. Each element should be congruent with and may refer to applicable, existing rulebooks and methods found in the accounting framework stack. Unspecified elements will be understood as to default to the most fundamental (lower) stack items. This keeps actual removal project or process descriptions as short and simple as possible.

Oncra Framework guideline elements

Removal Process

- A basic description of the removal process, like photosynthesis, burial, enhanced weathering. Three TRL Level tiers are available, as specified under Assessment Principles

System and boundaries

- A visual representation / mapping of the removal system, including clear system boundaries.
- A short description of the system and scope 1, 2 and 3 emission sources. An LCA report must be provided for Oncra Implementation level certification.

Credit point

- The point in the system where the credit is quantified and measured is the credit creation point.

Quantification metrics

- Choice for flow or project based quantification
- Mathematical formula(s) for how the removed carbon is allocated over time (years)
- Modelling provisions for possible reversal and permanence.

MRV (Measuring, Reporting and Verification) protocol

- Data gathering frequency and technologies
- Methodology for relating measurements to model predictions
- Reporting frequency and format
- Independent verification needs

5. Assessment Process Flow

An Oncra project or Chain Assessment follows the following process flow. Assessment Principles guiding the process flow are elaborated on in Article 8.

Quantify

- Remover provides data and signs contract
- Remover company integrity?
- Project / Removal chain integrity?
- How much CO₂ will be removed?
- Data Validation Statement issued, with description of framework elements:
 - Removal process
 - System and boundaries
 - Credit point
 - Quantification metrics
 - MRV Protocol
- Remover contract signed by Oncra returned to Remover
- Oncra is paid a fixed fee for the assessment by Climate Cleanup Foundation

OK?

- Confirmation: project correct and number of credits
- Number of credits will be credited to the Ledger

NOT OK?

- rejection
- possible reassessment

Certify

- All transfers must be reported to Oncra and registered in the Ledger
- Check: are credits available? YES then continue:
- Check: over 1000 credits? Then Buyer KYC. YES then continue:
- Payment by buyer. Successful, then:
 - Ledger is updated: buyer linked to credit(s), saleable quantity reduced
 - Certificate in buyer's name with number of credits purchased available
 - Climate Cleanup Foundation is paid max 7% of sales via Remover or Marketplace

Verify

- start monitoring process
 - biennial check: are commitments being made?
 - after x years (depending on type of commitment): holding pool adjustment.
- Positive deviation: holding pool free, extra credits
- Negative deviation: adjust from other projects OR future projects
- Large negative deviation, bankruptcy, force majeure: credits marked as expired, but NO compensation for buyer or remover.

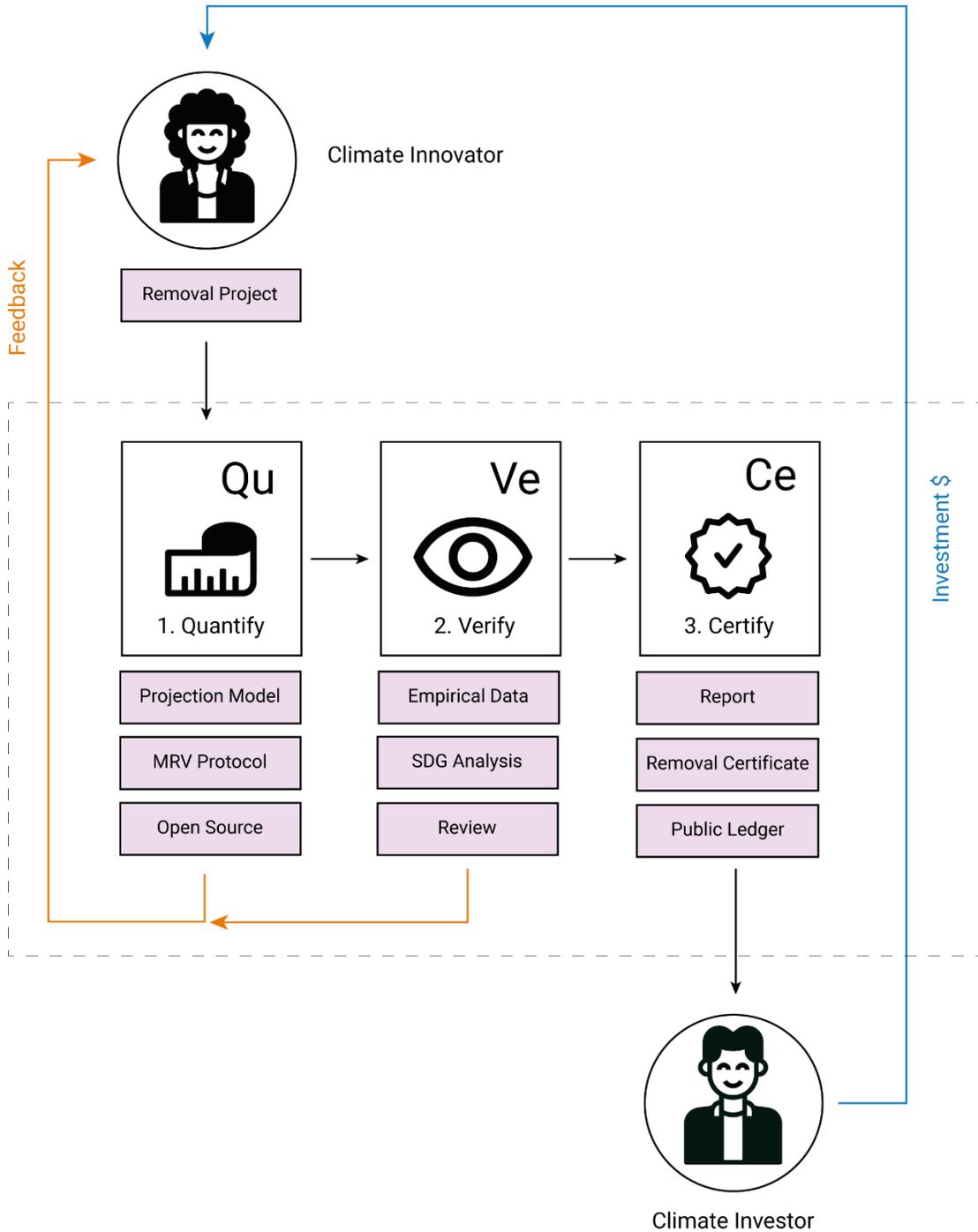


Figure 2. Oncra process schema

Elaboration of three flow elements

Quantify

Quantification follows the accounting principles as set out in the applicable Sectoral Carbon Removal Accounting Protocol: Land, Ocean, Rock or Construction Stored Carbon. These protocols either refer to accounting methods set out by bodies recognised in the Oncra Accounting Stack, or define accounting guidelines for removal processes without a clear methodological framework.

Certify

Oncra CRCs are issued as certificates and recorded on a carbon removal ledger. Oncra uses a simple ledger on a publicly accessible and sustainable (Proof of Stake) blockchain, thus offering immutable proof of issuance and ownership. All transactions of certificate ownership have to be recorded in the Oncra ledger, if not the Oncra certification status is immediately withdrawn.

Verify

In the Verification phase, the MRV Protocol specified in the Data Validation Statement has to be followed to reach reasonable assurance about the actual carbon removal. If the Remover fails to follow the MRV Protocol or if irregularities like deviations from the removal projection beyond the holding pool appear, Oncra may first give the credits the Ledger status Concern. Remover will be informed of the irregularities in written form. If Remover fails to respond such that the integrity is restored within two years of the first warning, Oncra may label the credits as Void. This is irreversible. No compensation for either Remover or Buyer can be claimed with Oncra, neither can the Buyer claim any form of compensation with the Remover. However, newly created credits in current or future Projects or Chains by the same Remover will automatically be allocated to the Buyer which has Void credits issued on its Ledger account.

In the case Verification shows that the projected removal has been realised, credits in the holding pool are released. If more removal has taken place, extra credits may be issued at the Removers' initiative.

6. Information exchange

The following information needs to be exchanged between Remover and Oncra for credits to be issued on the Oncra Ledger.

4.1 Remover provides Oncra with specific information about the project before verification and credits can be added to the ledger. This information includes at least:

- name of field or location*
- geo-location*
- surface area*
- final legal ownership: name and ID of final carbon value owner*

- one photo of the project location*
- one photo of the final carbon value owner*
- written description of major project risks*

4.2 Quantification of carbon removed is enabled by collaboratively proving at least:

- specification of carbon removal practice(s)*
- certified* report of soil carbon baseline (in carbon dioxide weight-equivalent)*
- estimation of soil carbon capacity using best available scientific data*
- estimation or specification of full life cycle analysed operational impacts (carbon dioxide and other greenhouse gases, other impacts when relevant)*
- any other relevant information that may affect the project's climate impact*

* Certified means the measurements are done following ISO 10694, 14235 and 14040 norms or comparable.

4.3 During Verification phase, the Remover has to provide at least, if applicable:

- Yearly carbon crop harvest information: tonnes of material, carbon content and end use, congruent with the financial Construction Stored Carbon (CSC) metric*
- Certified soil carbon measurements at least once every two years*
- Value Chain credits: sales volume information*
- any other relevant information that may affect the project's climate impact*

4.4 Onkra provides the remover, at the moment of project validation, with access to:

- A Carbon Removal Certificate (CRC) congruent with the applicable metric, industry standard best practices and government prescribed (compliance) standard*
- all of the removers own and derived data*
- all of other removers' carbon data unless marked proprietary*
- actual estimates and assessments of the project's carbon removal and wider climate impacts*
- a TRL level assessment (1-9) over three tiers (see 7. Technology Readiness Level)*
- an indication on permanence (how long is the carbon expected to be stored)*
- all estimation and calculation methods and models developed within Onkra*
- all actually used models and calculations to account and estimate climate value*

7. Ledger rules and Buffer pool

When a project is accepted into the Ledger, the indicated percentage of credits is marked as 'on hold', until the applicable MRV protocol has proven the actual physical removal and storage of the carbon dioxide (in the form of carbon). At that point, the number of credits for the project is adjusted according to the measurements, and the corresponding number of credits in the holding pool is either released for sale or destroyed.

If the project underperforms even the buffer pool, the Remover has to compensate from either existing or future projects. If the project overperforms, creating more removal

than anticipated, the Remover may apply for additional credits on the Ledger, in addition to the credits at that point released from the holding pool.

Ledger Status Indications

Credits on the Leger related to projects or chains can have different status, reflecting the actual removal process and integrity. These status indicators are:

Issued	Credits issued and available for transfer
Hold	In holding pool
Transferred	Sold to Buyer
Cancelled	Cancelled by Buyer to claim removal in reporting
Concern	Applicable MRV protocol is not followed or shows irregularities
Void	Project or chain integrity void by contingency or force majeure

Buffer holding pool

Onkra recognises inherent uncertainties in nature based climate solutions, and related certification. To ensure full integrity and mitigate the risk of reversal (stored carbon again emitted) and overestimation, without increasing the carbon accounting administrative burden, a substantial buffer pool is held. The size of the buffer is related to the TRL level, as indicated below.

TRL Level tier	TRL 1-3	TRL 4-6	TRL 7-9
Innovation phase	Research	Development	Integration
Buffer pool	50%	35%	20%

Table 2: TRL Tiers with buffer pool requirements (% of certificates in holding awaiting final verification).

8. Onkra Assessment Principles

The following Assessment Principles serve to guide the accounting decisions made in the Assessment Flow as set out before (Article 6.)

Empirical Crediting: Real World Data Principle

Most carbon removal project accounting needs some form of modelling and interpretation. While these models are never perfect, what we call Real World Datapoints (RWD) is the closest we can get to actual reality. Technological advantages (satellite, IoT censoring) using actual data enables [empirical crediting](#). Onkra meticulously records real world data points, and acquiring these data points must be done by parties and labs following international standards and norms.

ISO norms, set by the International Organisation for Standardisation in Switzerland are the basis for rigorous and science based assessments. These include ISO 14064-1 (on the quantification of greenhouse gas emissions and removals) and ISO 14064-2 (providing project level guidance) and ISO 14064-3 (on validation and verification). All calculations must follow full life cycle assessment principles, as specified in ISO norms 14040 and 14044. On Soil Organic Carbon levels, for example, measurements must follow ISO 10694 (dry combustion method) or ISO 14235 (sulfochromic oxidation method), or comparable.

Double Counting and Additionality

Double Counting of removed carbon, thus double selling credits, is very undesirable and therefore prohibited. No-double-counting has to be proven by Removers by handing over contracts with both suppliers and customers over the value chain, stating that they have and will not sell carbon credits on the products or materials.

Additionality is ensured by checking if the removal pathway or project is represented in the National Determined Contributions of the country where the removal is effectuated. Onkra does not favour an analysis of whether the removal would have taken place without the carbon credit capital. In the current phase of the climate crisis, any money invested in carbon removal companies or projects is considered crucial, even if it would mean that carbon credit money would not all be invested in the project the credits were issued for, but are invested in another project or in research and development.

Ton-year accounting and Permanence

All removal durations are by default converted into an at least 100 year timescale.

Open Sourcing data and models

In carbon accounting practice, methods (the rules) are often open source but the actual calculation models are mostly not. Because of this, it is hard to get trustworthy estimations and calculations on for example how much carbon your average bamboo forest or seaweed farm could store. Most experts do not have real incentives to pool, disclose and share data. Also farmers and other removers might be reluctant to share data related to their business plan. Onkra radically opens and shares all data, unless it is very clearly endangering business models; in that case we anonymise data points.

In the climate crisis, sharing this data is of the utmost importance. We take an example in Volvo, who at some point opened their patent for car seatbelts, or Tesla, who shared IP for their electric cars. If you are in a boat which is sinking, and you have the design for a better lifeboat, it's better for everyone to share that design, as soon as possible.

Ex ante innovation certification assurance needs

Ex ante certification enables certification of projects before the carbon has been actually removed and stored. It is crucial now for the development of Nature based Solutions, because scaling of value chains towards gigaton removal needs rapid innovation. Ex ante certification is enabled by the combination of solid modelling, rigorous data collection regularly refining storage predictions, and best-in-industry buffer pools (see article

12.). The ex ante project reviewer must provide a complete, valid and accurate assessment following [IAASB guidelines](#), delivering a limited assurance level for projects in the first two TLR tiers (1-3 and 4-6), while reasonable assurance is required for implementation of the highest TLR level projects (TRL 7-9).

Technology Readiness Level (TRL) assessment

Oncra assesses projects on three TRL level tiers, as innovation is currently highly needed in the natural carbon removal space. The three tiers cover TRLs 1-3 for Research phase projects, 4-6 for the Development phase, and 7-9 for market ready Integration phase projects. Removers may use data points with a lower margin of certainty, for example from non ISO certified labs or measurements, however this will result in certification under a lower TRL level tier.

TRL Level tier	TRL 1-3	TRL 4-6	TRL 7-9
Innovation phase	Research	Development	Integration

How does Oncra include all systemic benefits?

The climate crisis doesn't come in isolation; it is a result of humanity's past relationship with natural systems. Nature based Solutions are systemic in that they solve the climate and biodiversity crises at the same time. This 'multi-potency' on a systemic level translates into a host of almost 'too good to be true' advantages, as most solutions provide life supporting services like clean water, habitat, nature parks, clean energy, and materials actually storing carbon. While a Doughnut analysis is performed on at least a binary (yes/no) level, all nature based removals allowed into the Oncra accounting framework are by nature regenerative: they do more good than harm to human and natural ecosystems.

Version control

Version date	Changes
7 Feb 2022	First draft
12 Feb 2022	Added Methods and Norms, Real World Data principle, Ex Ante rules
1 March 2022	Buffer pool updated; 20, 35 and 50% over different TRL tiers
11 March 2022	'Optional' added to transaction platform description, and clause under which CRCs may be sold outside this platform
11 June 2022	Chain Certification, Double Counting and Permanences created

'Certificates' -> 'credits'
'Metrics' -> framework structure
Framework Structure elaborated on
Transaction Platform and Price moved to new Climate Cleanup
transaction platform Guideline document

20 June 2022 Guidelines restructured to better follow assessment flow

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