CLIMATE CHANGE
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Interim Report

# Certification of Carbon Dioxide Removals

## Evaluation of the Commission Proposal

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**Abstract: Certification of Carbon Dioxide Removals**

On 30 November 2022, the Commission proposed an EU carbon removal certification framework (CRCF). The proposed framework could undermine the environmental integrity of EU climate policies. This risk is aggravated by the fact that the EU has not agreed on the role of removals for the time past the year 2030.

This report assesses the Commission's proposal for the CRCF and discusses interlinkages of the CRCF with other pieces of EU climate law. The report provides an overview of the proposal's main elements and assesses them. Criteria for assessment include (1) whether the proposal strengthens EU climate policies, (2) whether it safeguards the integrity of climate policies, (3) whether it contributes to strong environmental policies and (4) whether it takes account of other aspects relevant for the uptake of carbon removals, such as energy consumption, cost saving, and innovations.

**Kurzbeschreibung: Zertifizierung von Kohlenstoffentnahmen**

Am 30. November 2022 schlug die Kommission eine EU-Verordnung für die Zertifizierung von $CO_2$-Entnahme (CRCF) vor. Die vorgeschlagene Verordnung könnte die Umweltintegrität der EU-Klimapolitik gefährden. Dieses Risiko wird dadurch verstärkt, dass sich die EU nicht auf die Rolle von Kohlenstoffentnahme für die Zeit nach 2030 geeinigt hat.

Dieser Bericht bewertet den Vorschlag der Kommission für das CRCF. Der Bericht gibt einen Überblick über die Hauptelemente des Vorschlags und bewertet sie. Zu den Bewertungskriterien gehören, (1) ob der Vorschlag die EU-Klimapolitik stärkt, (2) ob er die Umweltintegrität wahrt, (3) ob er zu einer starken Umweltpolitik beiträgt und (4) ob er andere für Kohlenstoffentnahme relevante Aspekte berücksichtigt, wie Energieverbrauch, Kosteneinsparungen, Innovationen und gesellschaftliche Akzeptanz.

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| | |
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| **BECCS** | Bioenergy with carbon capture and storage |
| **CAP** | Common Agriculture Policy |
| **CBs** | Certification bodies |
| **CCS** | Carbon Capture and Storage |
| **CCU** | Carbon Capture and Utilisation |
| **CDM** | Clean Development Mechanism |
| **CDR** | Carbon Dioxide Removal |
| **$CO_2$** | Carbon dioxide |
| **CORSIA** | Carbon Offsetting and Reduction Scheme for International Aviation |
| **CRCF** | Carbon Removal Certification Framework |
| **CSs** | Certification schemes |
| **DACCS** | Direct Air Carbon Capture and Storage |
| **ECL** | European Climate Law |
| **ELD** | Environmental Liability Directive |
| **ESR** | Effort Sharing regulation |
| **ETS** | Emissions Trading System |
| **EU** | European Union |
| **IPCC** | Intergovernmental Panel on Climate Change |
| **GHG** | Greenhouse gas emissions |
| **LULUCF** | Land Use, Land-Use Change and Forestry |
| **NDC** | Nationally determined contributions |
| **OIMP** | Other international mitigation purposes |
| **TFEU** | Treaty on the Functioning of the European Union |
| **UNFCCC** | United Nations Framework Convention on Climate Change |

## Summary

On 30 November 2022, the Commission proposed an EU Carbon Removal Certification Framework (CRCF). The Commission's proposal is an important initiative for promoting the implementation of carbon removals within the EU. It aims to help generate additional funding for removal activities.

However, the proposal remains vague on crucial regulatory aspects. This implies significant risks regarding the quality of carbon removal units issued under the framework and their use. Ultimately, the proposed framework could undermine the environmental integrity of EU climate policies.

In more detail, the proposal raises **the following questions:**

- **Unlimited use of removal units:** The proposal contains no explicit rules on the eligible uses of the removal units – one of the most significant regulatory issues of carbon certification. In consequence, the units' use remains unlimited; units can potentially be used for any possible purpose.

  The unlimited use of removal units raises concerns. For climate protection, it is risky to swap carbon safely stored in coal, gas, or oil in geological reservoirs – which are not subject to natural reversal risks – with carbon unsafely and temporarily parked in terrestrial reservoirs, such as in biomass or products which are subject to significant anthropogenic and natural reversal risks. Relying strongly on removals, rather than reducing emissions, could also lock in emission pathways that make achieving 1.5 C more difficult and lead to higher concentrations of $CO_2$ in the atmosphere, setting into motion climate tipping points that cause additional emissions and accelerate climate change. Moreover, an unlimited use, including for offsetting, raises double counting risks.

  For these reasons, the **CRCF should prohibit the use of removal units for complying with emission reduction obligations**. In turn, the CRCF should limit the use of removal units to (1) complying with carbon removal obligations under EU, national or sub-national policies other than the EU ETS, ESR or LULUCF Regulation, (2) voluntary uses for purposes other than offsetting, such as contribution claims, and (3) disbursing subsidies and other incentives. Given the limited availability of sustainable biomass, bioenergy with carbon capture and storage (BECCS) removals should generally not be eligible for certification under the CRCF.

- **Promoting carbon removals without a sense of direction:** The EU has not agreed on the contributions of carbon removals to its climate policies after 2030. The EU's climate target for 2030 limits and clarifies the contribution of removals to target achievement, but the 2050 climate neutrality target is silent on the role of removals, and the 2040 target is yet to be adopted. Other relevant EU laws, such as the Emission Trading Scheme (ETS) or the Effort Sharing Regulation (ESR), currently do not allow an unlimited use of removals, but there are already proposals to make carbon removals a currency for meeting obligations under these rules.

  In this context of strategic unclarity, it is risky to promote the use of removal units, potentially including using removals of any type for offsetting emissions. Without adequate safeguards that limit the use of carbon removal units and set high standards for their quality, it is conceivable that the CRCF helps put the EU on a dangerous track that allows it to substitute emission reductions with removal units. Given the inherent differences between

removals and reductions, such an approach would undermine the integrity of EU climate action. Shortcomings in the proposed certification requirements ("QU.A.L.ITY" criteria) aggravate these risks.

To avoid this, it is critical that the EU clarifies swiftly the contributions of carbon removals to its climate policies – for example through separate removal targets for removals through carbon farming as well as geological sequestration for 2040 and 2050.

- **Definition of carbon removals:** The Commission's proposal defines carbon removals – among others – as "the reduction of carbon release from a biogenic carbon pool to the atmosphere." Hence, the proposed definition covers both – emission reductions and carbon removals. This definition is incompatible with the terminology under the UNFCCC and the IPCC's definition, which defines removals as the withdrawal of greenhouse gases from the atmosphere.

  The proposed definition has significant implications. As it includes emissions reductions, it inflates the number of potentially available removal units. In addition, the proposed definition does not guarantee that $CO_2$ is effectively removed from the atmosphere, thus helping to generate negative emissions. This could undermine efforts to achieve negative emissions as required by the European Climate Law (ECL). The proposed definition also conflicts with requirements of regulatory clarity as set out in the EU's Better Regulation Guidelines.

- **Definition of permanence:** The proposal defines "permanent carbon storage" as a carbon removal activity that […] "stores atmospheric or biogenic carbon for several centuries." It is yet to establish what "several centuries" means. As significant parts of emitted $CO_2$ stay in the atmosphere much longer than several centuries, the CRCF should define permanence at least as the time that $CO_2$ is expected to remain in the atmosphere. In contrast to the Commission's proposal, the Clean Development Mechanism's (CDM) decision on CCS takes a more prudent approach by considering geological storage as potentially non-permanent. It is problematic that the Commission's proposal defines geological storage as permanent while this is not scientifically established.

- **Expiry and validity of removal units:** Expiry dates are one way of addressing non-permanence. For removal activities storing carbon in geological formations, the proposal sets no expiry date. These removal activities are considered to provide permanent storage – unlike removals generated by carbon farming or carbon stored in products. As the latter types of removals only park carbon temporarily, they expire at the end of the monitoring period.

  This system raises questions. If removal units could potentially be used to balance out emissions, temporary units must be excluded from such use. Alternatively, the CRCF should explicitly require temporary units to be or constantly renewed for the time that carbon remains in the atmosphere. The proposal, however, makes no provisions to this end. Also, strong liability mechanisms for addressing reversals during the monitoring period must be put in place.

- **No legal obligation for long-term storage:** Although of great importance, the proposed rules on long-term storage are incomplete. The proposal contains no legal obligation on operators to ensure long-term storage. Operators are only obliged to demonstrate that the removal activity "aims" at ensuring long-term storage. The proposal itself also contains no definition of "long-term".

- **Transfer of responsibility to state and externalisation of costs:** If the liability rules of the CCS Directive are applicable to carbon removal and storage in geological formations, the responsibility for monitoring, compensation and remedies would be transferred from the operator to the state after the closure of the storage site. Given the large amounts of carbon that could be stored in geological formations until 2050 and beyond, this transfer of responsibility could present a significant burden for future generations – in particular if leakages from geological formations are larger than currently anticipated.
- **Quantification of removals through standardised baselines:** The proposal's formula for the quantification of removals applies a standardised baseline. This baseline corresponds "to the standard carbon removal performance of comparable activities in similar social, economic, environmental and technological circumstances […]." If this provision is understood as the average performance in the sector, it would lack ambition and could imply that action that is already being undertaken becomes certified, thus undermining the environmental integrity of the certification framework. Moreover, the proposal does not specify how consistency of regional baselines with the national level can be achieved.
- **Quantification of removals should be conservative, not accurate:** International rules require removals to be determined in a conservative manner, rather than according to the most accurate estimates. All major carbon crediting programs apply this principle. By contrast, the proposal does not mention the principle of conservativeness, but stipulates the use of the most accurate estimates. This is a major weakness of the proposal.
- **Delegation of power:** The proposal empowers the Commission to regulate the certification methodology through delegated acts, which includes issues as important as permanence, or even the use of removal units. According to Article 290 of the Treaty on the Functioning of the European Union (TFEU), "essential elements" of a legislative act may not be delegated to the Commission. Because of the essential importance of the certification methodology to the CRCF, it is questionable whether the proposed delegation of power is compatible with Article 290 TFEU.

## Zusammenfassung

Am 30. November 2022 schlug die Kommission einen EU-Zertifizierungsrahmen für Kohlenstoffentnahme (*Carbon Removal Certification Framework*, CRCF) vor. Der Vorschlag der Kommission ist eine wichtige Initiative zur Förderung von Kohlenstoffentnahme in der EU. Ziel ist es, zusätzliche Fördermittel für Aktivitäten zur Kohlenstoffentnahme zu generieren.

Allerdings bleibt der Vorschlag in Bezug auf wichtige regulatorische Aspekte vage. Dies birgt erhebliche Risiken für die Qualität der Entnahmezertifikate, die in Zukunft vom CRCF ausgegeben werden und deren Verwendung. Letztlich könnte der vorgeschlagene CRCF die Umweltintegrität der EU-Klimapolitik untergraben.

Im Detail wirft der Vorschlag **die folgenden Fragen** auf:

- **Unbegrenzte Nutzung von Entnahmezertifikaten:** Der Vorschlag enthält keine ausdrücklichen Regeln für die zulässigen Verwendungszwecke der Entnahmezertifikate – eine der wichtigsten regulatorischen Fragen der Kohlenstoffzertifizierung. Infolgedessen bleibt die Verwendung der Entnahmezertifikate unbegrenzt; die Zertifikate können potenziell für jeden denkbaren Zweck verwendet werden.

  Die unbegrenzte Verwendung von Entnahmezertifikaten ist problematisch. Für den Klimaschutz ist es riskant, Kohlenstoff, der sicher in Kohle, Gas oder Öl in geologischen Reservoiren (die keinen natürlichen Leckagerisiken unterliegen) gespeichert ist, mit Kohlenstoff zu vertauschen, der unsicher und vorübergehend in terrestrischen Reservoiren geparkt ist, z. B. in Biomasse oder Produkten, die erheblichen Risiken unterliegen, durch anthropogene und natürliche Einflussfaktoren wieder freigesetzt zu werden. Wenn sich zu stark auf die Entnahme von Kohlenstoff konzentriert wird, anstatt auf Emissionsreduktion, könnten auch Emissionspfade festgeschrieben werden, die das Erreichen des 1,5 °C Ziels weiter erschweren und zu höheren $CO_2$-Konzentrationen in der Atmosphäre führen. Dies könnte wiederum Kipp-Punkte in Gang setzen, die zusätzliche Emissionen verursachen und den Klimawandel ihrerseits beschleunigen. Darüber hinaus birgt eine unbegrenzte Verwendung, einschließlich Offsetting, die Gefahr von Doppelzählungen.

  Aus diesen Gründen sollte der CRCF die **Verwendung von Entnahmezertifikaten für die Erfüllung von Emissionsreduktionsverpflichtungen ausschließen**. Der CRCF sollte die Verwendung von Entnahmezertifikaten beschränken auf (1) die Erfüllung von Verpflichtungen zur Kohlenstoffentnahme, die in anderen EU, nationalen oder subnationalen Gesetzen festgelegt sind, ausgenommen die Emissionshandelsverordnung, die Effort-Sharing oder die LULUCF Verordnung, (2) die freiwillige Verwendung für andere Zwecke als Offsetting, z. B. *contribution claims* (finanzielle Beiträge zum Klimaschutz ohne Anrechnung auf eigene Emissionsreduktionsziele), und (3) die Bereitstellung von Subventionen und anderen Anreizen, die an die Zertifizierung geknüpft sind. Angesichts der begrenzten Verfügbarkeit von nachhaltiger Biomasse sollte Bioenergie mit Kohlenstoffabscheidung und -speicherung (BECCS) generell nicht für eine Zertifizierung nach dem CRCF in Frage kommen.

- **Förderung von Kohlenstoffentnahme ohne Strategie:** Die EU hat sich nicht darauf geeinigt, welchen Beitrag die Entnahme von Kohlenstoff für ihre Klimapolitik nach 2030 leisten soll. Das EU-Klimaziel für 2030 quantifiziert und begrenzt den Beitrag von Kohlenstoffentnahme zur Zielerreichung; das Klimaneutralitätsziel für 2050 tut dies nicht, und für 2040 hat die EU noch kein Klimaziel verabschiedet. Andere einschlägige EU-Gesetze wie der Emissionshandel oder die Effort-Sharing-Verordnung erlauben derzeit keine

unbegrenzte Nutzung von Kohlenstoffentnahme. Es gibt allerdings bereits Vorschläge, Kohlenstoffentnahme zu einer Währung für die Erfüllung der Verpflichtungen im Rahmen dieser Regeln zu machen.

In diesem Kontext strategischer Unklarheit ist es riskant, die Verwendung von Entnahmezertifikaten zu fördern, einschließlich der Verwendung von Entnahmezertifikaten für Offsetting. Ohne angemessene Sicherheitsvorkehrungen, die die Verwendung von Kohlenstoffentnahmeeinheiten begrenzen und hohe Standards für ihre Qualität festlegen, könnte der CRCF dazu beitragen, die EU auf einen gefährlichen Weg zu bringen, der es ihr ermöglichen würde, Emissionsreduktionen durch Entnahmezertifikate zu ersetzen. Angesichts der inhärenten Unterschiede zwischen Kohlenstoffentnahme und -reduzierung würde ein solcher Ansatz die Integrität der EU-Klimamaßnahmen untergraben. Unzulänglichkeiten in den vorgeschlagenen Zertifizierungsanforderungen ("QU.A.L.ITY"-Kriterien) verschärfen diese Risiken.

Um dies zu vermeiden, ist es wichtig, dass die EU die Rolle der Kohlenstoffentnahme in ihrer Klimapolitik schnell klärt - zum Beispiel durch separate Ziele für Kohlenstoffentnahme für 2040 und 2050.

- **Definition des Kohlenstoffentnahme:** Der Vorschlag der Kommission definiert den Begriff der Kohlenstoffentnahme unter anderem als "die Verringerung der Freisetzung von Kohlenstoff aus einem biogenen Kohlenstoffpool in die Atmosphäre". Die vorgeschlagene Definition umfasst somit gleichermaßen Emissionsminderungen als auch Kohlenstoffentnahme. Diese Definition ist unvereinbar mit der Terminologie der UNFCCC und der Definition des IPCC, die Entnahme als das Entziehen von Treibhausgasen aus der Atmosphäre definieren.

  Die vorgeschlagene Definition hätte erhebliche Auswirkungen. Da sie auch Emissionsreduktionen einschließt, bläht sie die Anzahl der potenziell verfügbaren Entnahmezertifikate auf. Außerdem garantiert die vorgeschlagene Definition nicht, dass das $CO_2$ tatsächlich aus der Atmosphäre entfernt wird und so zu negativen Emissionen beiträgt. Dies könnte die im Europäischen Klimaschutzgesetz festgesetzte Verpflichtung zur Erreichung negativer Emissionen untergraben. Die vorgeschlagene Definition steht auch im Widerspruch zu den Anforderungen an Regelungsklarheit, die in den EU-Leitlinien für bessere Rechtsetzung festgelegt sind.

- **Definition von Permanenz:** Der Vorschlag definiert "dauerhafte Kohlenstoffspeicherung" als „eine $CO_2$-Entnahmetätigkeit, die [...] atmosphärisches oder biogenes $CO_2$ über mehrere Jahrhunderte speichert". Es ist noch nicht festgelegt, was "mehrere Jahrhunderte" bedeutet. Da erhebliche Teile des emittierten $CO_2$ viel länger als mehrere Jahrhunderte in der Atmosphäre verbleiben, sollte der CRCF den Begriff Permanenz als die Zeit definieren, die das $CO_2$ voraussichtlich in der Atmosphäre verbleiben wird. Im Gegensatz zum Vorschlag der Kommission wird in der Entscheidung des Clean Development Mechanismus (CDM) zu CCS ein vorsichtigerer Ansatz gewählt, nach welchem die geologische Speicherung als potenziell nicht dauerhaft angesehen wird. Es ist problematisch, dass der Vorschlag der Kommission die geologische Speicherung als dauerhaft definiert, obwohl diese wissenschaftlich nicht hinreichend fundiert ist.

- **Verfall und Gültigkeit von Entnahmezertifikaten:** Verfallsdaten sind eine Möglichkeit, die Wiederfreisetzung von gespeichertem Kohlenstoff zu berücksichtigen. Für Entnahmeaktivitäten, bei denen Kohlenstoff in geologischen Formationen gespeichert wird, sieht der Vorschlag kein Verfallsdatum vor. Diese Entnahmeaktivitäten werden als

dauerhafte Speicherung angesehen - im Gegensatz zur Entnahme durch carbon farming oder der Speicherung von Kohlenstoff in Produkten. Da die letztgenannten Arten von Entnahmen Kohlenstoff nur vorübergehend speichern, verfallen sie am Ende des Überwachungszeitraums.

Dieses Modell wirft Fragen auf. Wenn Entnahmezertifikate potenziell zum Offsetting von Emissionen genutzt werden könnten, müssen temporäre Einheiten von einer solchen Nutzung von vorneherein ausgeschlossen werden. Alternativ müsste der CRCF ausdrücklich vorschreiben, dass temporäre Einheiten für die Zeit, in der der Kohlenstoff in der Atmosphäre verbleibt, ständig erneuert werden müssen. Der CRCF enthält jedoch keine diesbezüglichen Bestimmungen. Außerdem müssen starke Haftungsmechanismen für den Fall von Umkehrungen während des Überwachungszeitraums eingeführt werden.

- **Keine gesetzliche Verpflichtung zur langfristigen Speicherung:** Die vom CRCF vorgeschlagenen Regeln zur Langzeitspeicherung sind zwar von großer Bedeutung, aber lückenhaft. Der Vorschlag enthält keine rechtliche Verpflichtung für Betreiber, eine langfristige Speicherung sicherzustellen. Die Betreiber müssen lediglich nachweisen, dass die Entnahmeaktivität darauf *abzielt*, eine langfristige Speicherung zu gewährleisten. Der Vorschlag selbst enthält auch keine Definition des Begriffs "langfristig".

- **Übertragung der Verantwortung auf den Staat und Externalisierung der Kosten:** Wenn die Haftungsregeln der CCS-Richtlinie auf Entnahme und anschließender Speicherung von Kohlenstoff in geologischen Formationen anwendbar sind, würde die Verantwortung für Überwachung, Entschädigung und Abhilfemaßnahmen nach der Schließung der Speicherstätte vom Betreiber auf den Staat übertragen. Angesichts der großen Mengen an Kohlenstoff, die bis 2050 und darüber hinaus in geologischen Formationen gespeichert werden könnten, könnte diese Übertragung von Verantwortung eine erhebliche Belastung künftiger Generationen darstellen - vor allem dann, wenn es zu größeren Leckagen aus geologischen Formationen kommen sollte als derzeit angenommen.

- **Quantifizierung der Entnahme durch standardisierte Baselines:** Nach dem Vorschlag soll die Entnahme in der Regel nach einer standardisierten Baseline quantifiziert werden. Diese Baseline "entspricht der Standard-CO2-Entnahmeleistung vergleichbarer Tätigkeiten unter ähnlichen sozialen, wirtschaftlichen, ökologischen und technologischen Gegebenheiten [...]". Wenn diese Bestimmung als durchschnittliche Leistung in der Branche verstanden wird, wäre sie nicht ambitioniert genug und könnte bedeuten, dass Maßnahmen, die bereits ohnehin durchgeführt werden, zertifiziert werden könnten. Hierdurch würde die Umweltintegrität des CRCF untergraben werden. Außerdem wird in dem Vorschlag nicht erläutert, wie die Übereinstimmung von regionalen Baselines mit der nationalen Ebene erreicht werden kann.

- **Die Quantifizierung der Entnahmen sollte konservativ, nicht exakt sein:** Einschlägige internationalen Regeln verlangen, dass Entnahme konservativ und nicht nach den genauesten Schätzungen ermittelt wird. Alle großen Zertifizierungsprogramme, die auf dem Kohlenstoffmarkt operieren, wenden diesen Grundsatz an. Im Gegensatz dazu erwähnt der Vorschlag den Grundsatz der Konservativität nicht, sondern schreibt die Verwendung der genauesten Schätzungen vor. Darin liegt eine große Schwäche des Vorschlags.

- **Delegierte Rechtsakte:** Der Vorschlag ermächtigt die Kommission, die Zertifizierungsmethodik durch delegierte Rechtsakte zu regeln, was wichtige Fragen wie Dauerhaftigkeit oder sogar die Verwendung von Entnahmezertifikate umfassen kann. Gemäß Artikel 290 des Vertrags über die Arbeitsweise der Europäischen Union (AEUV)

dürfen "wesentliche Elemente" eines Rechtsakts nicht an die Kommission delegiert werden. Aufgrund der wesentlichen Bedeutung der Zertifizierungsmethodik für den CRCF ist es fraglich, ob die vorgeschlagene Befugnisübertragung mit Artikel 290 AEUV vereinbar ist.

# 1 Introduction

To limit an increase in temperature to well below 2°C or below 1.5°C compared to pre-industrial levels, drastic and immediate reductions of greenhouse gas (GHG) emissions are essential, but likely insufficient. According to the IPCC, effectively all emission reduction pathways that limit warming to 1.5°C (>50% likelihood) with no or limited overshoot, and those that limit warming to 2°C (>67% likelihood), assume that $CO_2$ is removed from the atmosphere (Carbon Dioxide Removal (CDR) (IPCC 2021). The deployment of **CDR to counterbalance hard-to-abate residual emissions is considered "unavoidable"** (IPCC 2021).

**EU policies and laws recognise the importance of carbon removals.** The European Climate Law (ECL), for example, establishes a legally binding target for the EU to become climate neutral by 2050. By then, greenhouse gas emissions (GHG) and removals regulated in the EU must be balanced. The ECL also sets an EU net GHG emissions target for 2030 allowing a contribution of net removals to this target of a maximum of 225 million tonnes of $CO_2$ equivalent. Furthermore, the ECL requires the EU to aim at removing more GHG than it emits after 2050. The LULUCF Regulation and long-term climate strategies of Member States also require the removal of carbon.

With the Commission's proposal on a Carbon Removal Certification Framework (CRCF) of 30 November 2022, the **political debate in the EU on carbon removals has entered a new phase**. The Commission proposes a voluntary EU framework for carbon removal certification, which includes criteria for the certification of removals, rules for the certification process and the recognition of certification schemes. With this proposal, the Commission intends to support the effective upscale of carbon removals.

Against this backdrop, **this report assesses the Commission's proposal for the CRCF**. The report provides brief overviews of the proposal's main elements and assesses them. Criteria for assessment include (1) whether the proposal strengthens EU climate policies, (2) whether it safeguards the integrity of climate policies, (3) whether it contributes to strong environmental policies and (4) whether it takes account of other aspects relevant for the uptake of carbon removals, such as energy consumption, cost saving, and innovations. In its last section, the report discusses the interaction of the CRCF with other pieces of EU climate law.

**Another report by Ecologic Institute and Oeko-Institut** provides a detailed evaluation of the CRCF certification criteria from the perspective of climate-friendly soil management activities (McDonald et al. 2023). Accordingly, we do not cover these issues in detail in this paper.

# 2 The Commission's Proposal: Main Elements and Assessment

## 2.1 Scope (Article 1)

According to Article 1, the proposal establishes an EU framework for carbon removal certification. For this purpose, the proposal establishes criteria for issuing carbon removal units in the EU. The proposal also sets rules for carbon removal certification and for the recognition of certification schemes. The main objectives of the proposed framework are to ensure that carbon removal units in the EU are of high quality, to avoid greenwashing and to promote action in implementing and funding carbon removals within the EU (recitals 3 and 4).

### 2.1.1 Assessment

#### 2.1.1.1 Voluntary EU framework for certification of carbon removals

The regulation establishes a *voluntary* EU certification framework. This means that there is no legal obligation for operators[1] or certifiers to use this framework. It does not mean, however, that the regulation establishes no legal obligations:

- If operators wish to obtain an EU certification under this regulation, they must comply with the various obligations established by the CRCF.
- The regulation also places obligations on Member States (e.g. supervision of certification schemes) and on the Commission (e.g. recognition of certification schemes).

#### 2.1.1.2 Use of carbon removal units

The proposal contains no explicit rules on the use of carbon removal units. In consequence, **carbon removal units could be used for any possible purpose**. Recital 21 confirms this interpretation.[2]

**In principle**, carbon removal units could be used for **several different purposes**:

- **Compliance use under the EU regulations governing the target architecture:** In theory, it is conceivable that entities under the EU Emissions Trading System (ETS) could be allowed to use carbon removal units to fulfil their obligations.[3] Similarly, it is theoretically also possible that Member States could use removal units to meet their obligations under the ESR or the LULUCF regulation. Such use is not possible because all three EU regulations do not allow the use of carbon removal units from the CRCF. In fact, such uses would lead to double counting of removals and thus undermine the EU climate architecture. This is because

[1] An operator is any legal or physical person who operates or controls a carbon removal activity, such as farmers, land-user, or technology plant operators (Article 2.1 d)).

[2] Recital 21 states "it is appropriate that carbon removal certificates underpin different end-uses, such as the compilation of national and corporate greenhouse gas inventories, including with regard to Regulation (EU) 2018/841 of the European Parliament and of the Council, the proof of climate-related and other environmental corporate claims (including on biodiversity), or the exchange of verified carbon removal units through voluntary carbon offsetting markets (emphasis added)."

[3] However, Art. 2.1 of the proposal states that the framework does not apply to emissions falling within the scope of ETS Directive, with the exception of the storage of carbon dioxide emissions from sustainable biomass that are zero-rated by the Directive.

Member States automatically count these removals in measuring progress towards their obligations under the EU LULUCF regulation.[4]

- **Compliance use under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA):** In theory, it is conceivable that carbon removal units be recognised under CORSIA. This is, however, questionable because the set-up of the CRCF differs in several aspects from common carbon crediting programs as recognised under CORSIA. Moreover, using carbon removal units towards CORSIA would require that the EU authorises the underlying mitigation outcomes under Article 6 of the Paris Agreement for use towards other international mitigation purposes (OIMP) in order to avoid double claiming with the EU NDC. In this case, these removals could no longer be used by the EU to achieve its own NDC, which could undermine the ability of the EU to achieve its NDC. Indeed, the proposal does not mention this type of use.
- **Compliance use under other EU, national or sub-national policies:** As another conceivable option, the EU, its Member States, or sub-national jurisdictions could adopt laws that require or allow certain entities to surrender carbon removal units to fulfil other obligations. For example, operators under the EU Fuel Quality Directive could be allowed to use carbon removal units to fulfil their compliance obligations regarding the emissions intensity of transport fuels under the Directive. In this way, the units would become eligible for meeting the targets under this Directive. The proposal does not mention whether this type of use is covered.
- **Voluntary use for offsetting by companies, institutions, jurisdictions, or individuals:** The carbon removal units could be used by different entities to voluntarily offset their emissions. This may include companies, administrations such as cities, non-governmental institutions or even individuals. There is considerable debate among stakeholders on whether double claiming with nationally determined targets (NDCs) must be avoided for such type of units to be used for offsetting purposes (Fearnehough et al. 2020). If double claiming is to be avoided, this would require that the underlying mitigation outcomes must be authorised under Article 6 of the Paris Agreement for other international mitigation purposes (OIMP). As a consequence, the underlying removals could no longer be used by the EU to achieve its own NDC. Moreover, the same removals would be used both by EU Member States to fulfil their obligations under the EU LULUCF regulations and by the entities using to the carbon removal units for offsetting. This raises similar concerns as double claiming with NDCs. The proposal does not mention these matters.
- **Voluntary use for purposes other than offsetting:** To address double claiming challenges associated with offsetting, several stakeholders have proposed that such type of units could be used by companies, institutions, jurisdictions, or individuals to make climate mitigation contributions, without counting the associated removals toward own goals or targets. These concepts are also referred to as "contribution claims" or "climate responsibility" (WWF 2021; WWF 2022; NewClimate Institute 2020). This could also entail the development of a respective label.
- **Use as vehicle to disburse subsidies or provide incentives:** The removal units could also be used as a vehicle to help disburse public subsidies or provide incentives. For example,

[4] As a result of the removal activities, Member States report higher removal levels in their national GHG inventories and thus also count these removals under the EU LULUCF regulation. In some instances, removals may not (yet) be visible in national GHG inventories. However, inventories may improve over time in their granularity and not considering double counting risks in such instances is not recommended (Schneider et al. 2022).

subsidies may be provided for each unit that farmers surrender, or farmers may access certain subsidies under the Common Agriculture Policy (CAP) if they also generate and surrender units. This use does not imply any risk of double claiming.

It is crucial to note that the **environmental integrity**[5] of the CRCF largely depends on the purpose for which removal units are used. While removal units used for meeting emission reduction obligations can undermine the integrity of climate policies (see text box below), units used for other labelling purposes and the disbursement of subsidies are less likely to have such a detrimental effect.

**Carbon removals and the integrity of climate policies**

Compared to emission reductions, carbon removals are an inherently weaker way of climate action as they face challenges that do not apply to emission reductions:

- **Permanence:** Unlike carbon stored in coal, gas or oil in the ground, storage of carbon in biomass is only temporary. After certain periods, carbon stored in plants or soils is released back into the atmosphere. Put differently, while biotic carbon is part of the short-term and active carbon cycle, fossil carbon sinks are not. These different temporal characteristics of fossil vs. biotic carbon "represent a fundamental barrier to equivalence" (Carton et al. 2021). Carbon stored in products faces similar challenges. Atmospheric or biogenic carbon stored in e.g. building materials will only be kept out of the atmosphere during a building's lifetime. Utilising carbon in production processes (CCU) postpones the emission of the stored $CO_2$ for up to several decades (European Commission 2022).
  Technology-based removal options promise to solve problems of permanent storage. They can store carbon for centuries or even longer. However, their long-term impacts are unclear, and they struggle with biodiversity problems, land use challenges, issues of energy consumption, as well as high costs and low removal potentials (IPCC 2005). Innovation might solve some of these problems over time.

- **Locking in too high emission levels and risk of earth feedbacks:** Relying strongly on removals, rather than reducing emissions, could lock in emission pathways that make achieving 1.5 C more difficult. Removals can thus not simply substitute deep cuts in emissions today. If extensive use of removals today results in in higher overall emissions pathways, this could also lead to negative earth feedbacks, as higher levels of accumulate in the atmosphere, leading to greenhouse gas concentrations in the atmosphere that are more likely to set in motion tipping points of the climate systems, which – in turn – can lead to additional emissions and accelerating climate change (IPCC 2021). Carbon removals cannot simply repair delayed or foregone emission reductions (Zickfeld et al. 2021).

- **Challenges with ensuring high quality of removal units:** Compared to emission reductions from fossil fuels or abatement of non-$CO_2$ gases, the certification of nature-based carbon removals is challenging. First, data quality of removal activities and their wider environmental impacts and global implications with regard to leakage and food security is often poor. Second, the establishment of baselines for some removal activities struggles with significant uncertainties.

- **Inventory visibility:** There are significant challenges to make carbon removals visible in national GHG inventories. First, for carbon removal activities such as DACCS, storage in long-

[5] We refer here to environmental integrity in the light of climate policy and follow a definition provided by Schneider and La Hoz Theuer (2019) who define the term as "no increase in global aggregate emissions". Environmental integrity would be ensured if the framework leads to aggregated GHG emissions that are not higher as compared to a situation where the framework was not in place.

lasting products, rock carbonisation/enhanced weathering or marine geo-engineering, no quantification methodologies have (yet) been agreed under the IPCC and approved under the UNFCCC. Second, the allocation of some of the potential removal activities to the different inventory categories has not yet been clarified. Moreover, for some land-use activities such as enhancement of soil carbon, the granularity of national GHG inventories is often not sufficient to ensure visibility (Schneider et al. 2022). Visibility of removal activities in inventories and allocation to inventory categories is, however, crucial for the EU in order to account these removals towards achievement of its NDC. While most emission reductions are clearly visible in national GHG inventories, some removals may not be visible.

- **Expected removals could not materialise:** Partly linked to issues of data quality, it is challenging to project the EU's removals potentials. Significant uncertainties persist, in particular because of expected and unexpected impacts of climate change or natural disturbances on the removal capacities of natural sinks. In light of these uncertainties, there is the danger that emissions continue, while projected removals do not materialise.

Against this backdrop, we recommend that **Article 1 should prohibit** the use of removal units for complying with emission reduction obligations or for offsetting purposes. In turn, Article 1 should **limit the use of carbon removal units to the following**:

- Uses for complying with carbon *removal* obligations under EU, national or sub-national policies other than the EU ETS, ESR or LULUCF Regulation, in case those exist,
- Voluntary use for purposes other than offsetting, such as contribution claims,
- Use as vehicle to disburse subsidies or provide incentives.

It is important to limit the use of carbon removal units to these uses not only up to 2030 but also beyond, as the double counting risks described above would continue to apply after 2030. Because the purposes for which removal units may be used are an essential element of the CRCF, **the eligible and non-eligible uses should be regulated by the Articles of the Regulation**, not only mentioned in a legally non-binding recital.

Moreover, we recommend establishing **targets that clearly separate between emission reductions and removal.** Quantified removal targets for carbon farming approaches as well as geological sequestration that are separate from reduction targets – such as the EU climate target for 2030 – can safeguard the integrity of climate policies (McLaren et al. 2019; see below, chapter 3).

Lastly, defining the **eligible uses is an important aspect for setting the QU.A.L.ITY criteria**. For uses other than offsetting, including contribution claims, less stringent standards for certification may be justified in some areas, as the removal units would not be used for meeting emission reduction targets. Therefore, the risks for environmental integrity are lower for such uses. Nevertheless, all four QU.A.L.ITY criteria remain essential to ensure that funding for removal activities is used effectively and that the activities deliver and do not undermine broader social and environmental benefits (McDonald et al. 2023).

## 2.2 Definitions (Article 2)

Article 2 lays down the definitions governing the CRCF, among them definitions of carbon removal, carbon removal activities, biogenic carbon pools, long-lasting products, and permanence. **This provision is of critical importance**.

### 2.2.1 Carbon removal (Article 2.1(a))

The proposal defines carbon removal as

- "**either** the *storage* of atmospheric or biogenic carbon within geological carbon pools, biogenic carbon pools, long-lasting products and materials, and the marine environment", **or**
- "the *reduction* of carbon release from a biogenic carbon pool to the atmosphere" (emphasis added).

Along the same lines, the proposal defines 'carbon removal activity' as "one or more practices or processes carried out by an operator resulting in permanent carbon storage, enhancing carbon capture in a biogenic carbon pool, reducing the release of carbon from a biogenic carbon pool to the atmosphere, or storing atmospheric or biogenic carbon in long-lasting products or materials" (Art. 2.1(b)). In the logic of the proposal, there are three types of carbon removal activities, i.e.

- 'permanent carbon storage' (see definition discussed in 2.2.2, below)
- 'carbon farming' (defined in Art. 2.2(h) as "a carbon removal activity related to land management that results in the increase of carbon storage in living biomass, dead organic matter and soils by enhancing carbon capture and/or reducing the release of carbon to the atmosphere") and
- 'carbon storage in products' (defined in Art 2.1(i) as, a carbon removal activity that stores atmospheric and biogenic carbon in long-lasting products or materials).

Furthermore, it is important to differentiate between 'certificates' that merely state conformity of removals activities with the rules of the CRCF and 'carbon removal units' that identify certified net carbon removal benefits in tonnes of $CO_2$ generated by activities.

#### 2.2.1.1 Assessment

The IPCC defines CDRs as "the *withdrawal* of greenhouse gases from the atmosphere as a result of deliberate human activities."[6] The proposal's definition under Article 2.1(a) is incompatible with the IPCC's definition:

- **Reductions vs removals:** Unlike the IPCC, the proposal's definition includes the "reduction of carbon release from a biogenic carbon pool to the atmosphere." In other words, the definition includes reductions of emissions – effectively the opposition of removals: while reductions only slow down the increase of GHG concentration in the atmosphere, removals decrease it.
- **Carbon releases vs greenhouse gases:** The proposal refers to carbon releases, while the IPCC's definition is based on GHG. The term "carbon releases" is ambivalent but it seems to include any carbon containing molecule and thus encompasses carbon dioxide ($CO_2$) and methane ($CH_4$) and to exclude greenhouse gases that do not contain a carbon atom.

The proposal's definition of carbon removals has negative consequences:

- **Lack of regulatory clarity:** The proposal title – 'Regulation establishing a Union certification framework for carbon *removals*' – states that this legislation is about subtracting carbon; it is not about adding carbon to the atmosphere (although at a slower

[6] https://www.ipcc.ch/sr15/faq/faq-chapter-4/.

pace). Hence, the inclusion of emission reductions in a removal framework undermines regulatory clarity, as required by the EU's Better Regulation Guidelines. It also makes an already complex system even more complex.

- **Definition treats all removal options the same:** Although the proposal takes account of the significant differences of various carbon removal options (recital 5), the proposal's definition does not. It includes permanent as well as non-permanent removals and treats them alike in principle. In line with this rationale, Article 1.1(o) any 'carbon removal unit' is defined as one tonne of certified net carbon removal benefit generated by a carbon removal activity and registered by a certification scheme.
- **Climate neutrality:** If carbon removals and emission reductions are mixed, achieving climate neutrality and net negative emissions becomes more difficult. As removals would also include avoided emissions according to the approach proposed by the Commission, not all removals could be used to balance out emissions, blurring the achievement of the ECL's climate neutrality target. Moreover, monitoring the pathway towards the EU objective of climate neutrality and ultimately achieving climate neutrality cannot be verified.

### 2.2.2 Permanent storage

The permanence of carbon storage is a crucial regulatory item. The proposal defines 'permanent carbon storage' as "a carbon removal activity that, under normal circumstances and using appropriate management practices, stores atmospheric or biogenic carbon for *several centuries*, including bioenergy with carbon capture and storage and direct air carbon capture and storage" (Art. 2.1(g), *emphasis added*).

Art. 6.3 stipulates that for carbon farming and carbon stored in products, the carbon stored by a carbon removal activity shall be considered released to the atmosphere at the end of the monitoring period.[7] These removal activities are thus not considered as 'permanent' carbon storage (see also section 2.3.3).

Pursuant to Article 8.2, the Commission is empowered to adopt **delegated acts** to establish the technical certification methodologies for activities related to permanent carbon storage, carbon farming and carbon storage in products.

#### 2.2.2.1 Assessment

Although delegated acts will regulate the details defining permanence at a later stage, the proposed definition of permanence is **likely to remain deficient**:

- **Duration of storage:** Storage of carbon for several centuries – as proposed – would be significantly shorter than the thousands of years that significant parts of emitted $CO_2$ usually remain in the atmosphere[8], let alone the millions of years that fossil carbon is stored in coal, gas, and oil in the ground. To take account of this, the proposal should define permanence as the time that $CO_2$ stays in the atmosphere, not by the vague term "several centuries".
- **Bioenergy with carbon capture and storage (BECCS) and Direct Air Carbon Capture and Storage (DACCS) are not per se permanent:** As such, neither BECCS nor DACCS ensure permanent storage. The storage of carbon in geological formations is associated with

[7] According to the proposal, 'carbon storage in products' means a carbon removal activity that stores atmospheric and biogenic carbon in long-lasting products or materials (Art. 2.1.(i), emphasis added).

[8] Inman (2008) citing IPCC (2007): "About 50% of a $CO_2$ increase will be removed from the atmosphere within 30 years, and a further 30% will be removed within a few centuries. The remaining 20% may stay in the atmosphere for many thousands of years." But if cumulative emissions are high, the portion remaining in the atmosphere could be higher than this, models suggest.

some reversal risks. In contrast to the Commission's proposal, Parties to the Kyoto Protocol have recognised that CCS involves material non-permanence risks and have developed a ruleset under the CDM to avoid, monitor and compensate for any reversals from CCS activities.

## 2.3 Certification requirements (Article 3-8)

The proposal stipulates that carbon removals are **eligible for certification** if they:

- are quantified, resulting in a net removal benefit (Article 4),
- are additional (Article 5),
- aim at ensuring long term storage of carbon (Article 6),
- comply with the Regulation's sustainability criteria (Article 7), and
- are independently verified (Article 8).

### 2.3.1 Quantification

The proposal contains various requirements for the quantification of carbon removals:

- **Net carbon removal benefit:** A carbon removal activity must provide a net carbon removal benefit, which is quantified according to this formula: Net carbon removal benefit = carbon removals under the baseline (CRbaseline) – total carbon removals of the carbon removal activity (CRtotal) – GHG increases due to the implementation of the carbon removal activity > 0 (Art. 4.1).
- **Baseline:** In principle, removals are quantified applying a standardised baseline. This baseline corresponds "to the standard carbon removal performance of comparable activities in similar social, economic, environmental and technological circumstances and take into account the geographical context" (Article 4.5). Only in exceptional cases is an individual baseline applied, which would be "based on the individual carbon removal performance of that activity" (Article 4.6).
- **General quantification requirements:** Article 4.4 sets additional requirements for the quantification of carbon removals. Accordingly, carbon removals must be "quantified in a relevant, accurate, complete, consistent, comparable, and transparent manner."
- **Uncertainties:** Article 4.8 determines that the quantification of the carbon removals shall account for uncertainties in "accordance with recognised statistical approaches."

#### 2.3.1.1 Assessment

- **Quantification should be conservative, not accurate:** The rules for quantification include any increase in greenhouse gas emissions related to the implementation of the carbon removal activity. These include direct emissions, such as those resulting from the use of additional fertilisers, fuel or energy, or indirect emissions, such as those resulting from land use change caused by displacement of production, also referred to as 'leakage'. Such rules should ensure that carbon removal activities result in net positive climate impacts.

  International rules under the Clean Development Mechanism (CDM) and the Article 6.4 mechanism of the Paris Agreement require that removals are determined in a conservative manner to address uncertainty and avoid overestimation of emission reductions, rather than

using the most accurate estimates. All major carbon crediting programmes apply these principles. By contrast, the proposal does not mention the principle of conservativeness, but requires using the most accurate estimates. This is a major weakness of the proposal and sets ambitions lower than what is required under the Kyoto Protocol, and the Paris Agreement and common practice in the carbon market.

- **Ambition of baselines:** The Paris Agreement stipulates in both Article 6.2 and Article 6.4 that baselines should be set below business-as-usual emissions and be aligned with the goals of the Paris Agreement. In international negotiations, a key demand of the EU was that all countries implement ambitious baselines. By contrast, the proposal allows the "standard carbon removal performance of comparable activities" to be used as a baseline. If this is understood as the average performance in the sector, this provision could undermine integrity, as this implies that operators performing better than the average would be eligible for certification even for activities they are already undertaking. The standardised baseline should be oriented at 'Best Available Performance' of comparable activities and this benchmark should be updated within short time intervals (e.g. 5-year).
- **Carbon removal units:** The CRCF proposal is not explicit about the metrics of carbon removal units. It only uses the term "carbon removal benefit" but not does not explicitly require the use of "carbon dioxide equivalents".

### 2.3.2 Additionality

According to Article 5, carbon removal activity must be "additional".

To be "additional", the removal activity must (1) go beyond EU and national statutory requirements *and* (2) must take place due to the incentive effect of the certification. As an additional requirement, the removal activity must be in excess of the baselines that are used for the quantification of carbon removals (see section 2.3.1 above).

#### 2.3.2.1 Assessment

The proposed standardised baselines (Art. 4.5) raise significant concerns regarding nature-based removals, as these are unlikely to be additional if compared to standard practices of comparable activities (McDonald et al. 2023). Products based on biogenic carbon are also unlikely to be additional as they are common practice in many areas.

For technical removals, the risk of non-additionality is low. While operators of nature-based removals are subject to various legal obligations that lead to carbon removals, operators of technical removals do not face such obligations. Neither EU rules nor national rules require them to engage in activities that remove carbon. Hence, there is no significant risk of non-additionality due to activities being caused not by the CRCF, but by other policies. Moreover, for products storing atmospheric carbon (CCU), current EU legislation is limited to fuels produced from captured $CO_2$ (Directive 2018/2001), so that additionality for other types of products is likely.

### 2.3.3 Long-term storage

According to Article 6.1, operators must "demonstrate that a carbon removal activity *aims* at ensuring the *long-term* storage of carbon." The **proposal offers no fixed time spans defining long-term**. Instead, the proposal determines that operators must

- monitor and mitigate any risk of release of the stored carbon occurring during the monitoring period, and

- be subject to appropriate liability mechanisms to address reversals during the monitoring period.

Article 8 grants the Commission the right to adopt **delegated acts** to establish the certification methods as outlined in Annex 1. Annex 1 does not include further criteria defining "long-term".

#### 2.3.3.1 Assessment

- **No legal obligation for long-term storage:** The proposal contains no legal obligation for operators to ensure long-term storage. Operators are only obliged to demonstrate that the removal activity *aims* at ensuring long-term storage. The verb "to aim" indicates that the legislator does not establish a legal obligation. The Commission only proposes an obligation for operators to *monitor and mitigate risks* of release for a defined monitoring period but does not include an appropriate liability mechanism.
- **Liability for achieving long-term storage is unclear:** Recital 14 of the proposal lists several liability mechanisms, including discounting of carbon removal units, collective buffers or accounts of carbon removal units and up-front insurance mechanisms. All of these mechanisms have weaknesses and may not be able to guarantee storage for several decades in practice (Carbon Plan 2021; CCQI 2022a; Badgley et al. 2022). The specific liability mechanisms to be applied for carbon farming yet remain to be specified. The language in recitals 13 and 14 also suggests that liability mechanisms may not be compulsory ("appropriate liability mechanisms should be introduced to address cases of reversal"). It would be crucial though, to make operators liable for intentional reversals during the monitoring period. Liability must also be ensured in case operators cease to fulfil their obligations, e.g. because they terminate a project or go bankrupt. To compensate for unintentional reversals during the monitoring period (e.g. through storms, droughts or other instances of force majeure), buffer pools could be put in place. The specific rules for liability mechanisms need to fulfil high standards to ensure long-term storage (see e.g. CCQI 2022b).
- **Short-term storage is not legally excluded:** The "long-term" criterion seems to ban the certification of carbon farming activities or products that store carbon only for the short term (possibly less than 1 – 3 years). However, as the proposal does not set a legal obligation to ensure long-term storage, the certification of carbon farming activities or products with short-term storage remains legally possible. This counteracts the purpose of the framework to deliver removals that deliver long-lasting mitigation benefits.

### 2.3.4 Sustainability

According to Article 7.1, carbon removal activities must have a **neutral impact on or generate co-benefits for various sustainability objectives**. Article 7.2 lists these objectives, including climate change mitigation and adaptation, circular economy, pollution prevention and control, protection and restoration of biodiversity and ecosystems and sustainable use and protection of water and marine resources.

**Recital 15 offers further guidance.** This recital states that sustainability criteria for forestry activities could draw on the EU Taxonomy's sustainability criteria and on the Renewable Energy Directive's sustainability criteria for forest and agriculture biomass raw material. It also states that activities that harm biodiversity should not be certified, highlighting forest monocultures as an example.

#### 2.3.4.1 Assessment

As proposed, the sustainability criteria are vague and have no regulatory effects. They need to be specified by delegated acts. Going beyond the requirements of the CRCF, delegated acts should require net positive sustainability impacts of removal activities to be certified. All types of removal activities eligible under the framework need to be carefully designed to avoid negative social or environmental impacts (see also McDonald et al. 2023 for further details). Carbon removal units under the CRCF should include clear and transparent information on their sustainability impacts in order to communicate the benefits that set carbon farming activities apart from other types of removals.

The reference to the Renewable Energy Directive's sustainability criteria for forest and agriculture biomass raw material is useful. It is important that no backsliding from these rules occurs.

## 2.4 Validity of certified carbon removal units

The proposal **does not determine fixed periods of validity** of removal units. It sets no explicit expiry dates. Instead, the validity of the certified carbon removals *should* "depend on the expected duration of the storage and the different risks of reversal associated with the given carbon removal activity" (recital 13).

Because removals generated by **carbon farming or stored in products** are temporary, their validity should be subject to an expiry date (recital 13). This expiry date matches with the end of the relevant monitoring period. After the end of the monitoring period, the carbon should be assumed to be released into the atmosphere (Article 6), unless the operator "proves the maintenance of the carbon storage through uninterrupted monitoring activities" (recital 13).

For the **storage of carbon in geological formations**, the proposal seems to assume no expiry date. According to recital 13, carbon storage in geological formations "provide[s] enough certainties on the very long-term duration of several centuries for the stored carbon and can be considered as providing permanent storage of carbon."

### 2.4.1 Assessment

The duration of validity of removal units is an essential element of the proposal. The proposed rules on validity, however, raise concerns:

- **No obligation to renew or replace expired removal units:** The proposal contains no obligation to renew removal units after the monitoring period. The proposal only obliges the certification body to carry out a periodic re-certification but places no obligation on the operators or any other entity to ensure (constant) renewal of removal units. Moreover, there is no obligation on buyers to repeatedly purchase new removal units when temporary units expire.

  This is problematic if the unit is used to balance out emissions. As $CO_2$ stays in the atmosphere for very long periods (see above), it must be ensured that the emissions are removed for the same period – either through storage in geological formations or through uninterrupted renewal of removal units for the same period. However, removal units with a validity of 1000 years or an obligation of uninterrupted renewal for the same period are an implausible regulatory approach.

- **No monitoring period for storage in geological formations and hence no monitoring and liability obligations:** The proposal considers storage in geological formations as

permanent (recital 13). Presumably for this reason, activities that store carbon in geological formations are not subject to monitoring periods. This has important implications: according to Article 6.2, operators must monitor and mitigate risks of carbon releases only during the monitoring period; similarly, operators are liable for potential leakage *only during* the monitoring period. In consequence, it is not clear to what extent operators of activities storing carbon in geological formations are subject to monitoring, mitigation, and liability obligations.

- **Reversals that occur before the end of the monitoring period are not addressed:** If the certified carbon is released before the end of the monitoring period, the proposal does not contain specific rules ensuring that the removal unit becomes invalid and/or the reversal is compensated for.

## 2.5 Liability

To aim at ensuring long term storage, operators shall be "subject to appropriate liability mechanisms" (Article 6.2 in conjunction with Article 6.1). According to recital 14, "such mechanisms could include e.g., discounting of carbon removal units, collective buffers or accounts of carbon removal units, and up-front insurance mechanisms."

The Commission is empowered to adopt delegated acts to regulate details of liability.

To avoid double regulation, recital 14 states that liability mechanisms and relevant corrective measures laid down **by the CCS and ETS Directives** also apply to leakages from geological formations. According to Article 34 of the CCS Directive, the Environmental Liability Directive is applicable in principle.

**Liability under the CCS Directive**

In principle, an operator of a CCS project remains responsible for monitoring, reporting and corrective measures **until the storage site has been closed** (Article 18 of the CCS Directive). The storage site is closed once the requirements of the storage permit have been fulfilled, i.e. when the storage sites has been sealed and injection facilities have been removed.

Upon closure of the storage site, the operator's legal obligations are transferred to the competent authority or the host state of the storage site. In addition to the closure of the site, this **transfer of responsibility or externalization of costs to the state** requires that (1) stored $CO_2$ will be "completely and permanently contained", (2) a so-called minimum period has elapsed (to be determined by the competent authority but generally no less than 20 years), (3) the financial obligations referred to in Article 20 have been fulfilled and (4) the site has been sealed and the injection facilities have been removed (Article 18 CCS Directive). '**Complete and permanent containment**' is interpreted as the passage of a **10-year** period without leakage and conformity with the storage site's models (Weber, 2018).

**After the transfer of responsibility**, obligations of the operators cease – in principle. In cases of deficient data, concealment of relevant information, negligence, wilful deceit or a failure to exercise due diligence, however, the competent authority may recover costs from the former operator even after the transfer of responsibility (Article 18 (7)).

Article 19 of the CCS Directive obliges operators to provide **financial securities** to ensure that obligations arising under the storage permit are met. In principle, this financial security remains valid until the responsibilities of the operator are transferred to the competent authority. The operator is also obliged to provide a report documenting permanent and complete storage of $CO_2$.

According to Article 20 of the CCS Directive, Member States must ensure that operators make "a **financial contribution** available to the competent authority before the transfer of responsibility." This contribution shall cover at least the anticipated cost of monitoring for a period of 30 years and for other expenses arising from the maintenance of the storage site. Member States decide details of this financial contribution, taking into account the criteria referred to in Annex I goes here.

### 2.5.1 Assessment

Liability for leakage is an **essential element** of the regulation. The proposal contains a few rules for carbon storage in products and biomass, requiring an "appropriate system" of liability (see section 2.3.3 and 2.4). Concerning carbon storage in geological formations, the proposal refers to the more detailed liability rules of the ETS and CCS Directive.

Against this backdrop, the **following questions still require an answer**:

- **Externalisation of costs for 1000s of years?** The proposal contains no rules that would make operators liable for the time $CO_2$ remains in the atmosphere. If applicable, the CCS directive would transfer the responsibility of leakage to the state after the closure of the storage site – i.e. well before $CO_2$ has left the atmosphere. Given the large amounts of carbon to be stored until 2050 and beyond, this transfer of responsibility could present a significant burden for future generations – in particular if leakages from geological formations are larger than currently expected. It should be noted that the durability and long-term environmental implications of storing carbon in geological formations have not been tested for long periods.
- **Sufficient financial contributions?** The CCS directive requires operators to make financial contributions that cover at least the anticipated cost of monitoring for a period of 30 years and for other expenses arising from the maintenance of the storage site. Assuming the CCS directive is applicable to storage in geological formations, this contribution would not cover costs arising from the leaked $CO_2$ after the transfer of responsibility.
- **Preference for a specific liability system?** There are different liability systems available for carbon storage (see above). The proposal gives no preference to specific systems. The proposal Recital 14 offers some details but has no legal force. It also does not mention personal liability of operators as another option to ensure liability. In the voluntary carbon market, no liability system has proven to be able to robustly account for reversals and ensure permanence for sufficiently long periods.
- **Environmental Liability Directive relevant?** In principle, Article 34 of the CCS directive makes the Environmental Liability Directive (ELD) applicable to geological storage of carbon dioxide. It should be noted, however, that the ELD only applies to "*environmental damage or to an imminent threat of such damage caused by pollution of a diffuse character, where it is possible to establish a causal link between the damage and the activities of individual operators*" (Article 4.5 of the ELD). Given the diffuse causal link between leakage from geological storage and climate damage, it is questionable whether the ELD would establish an additional layer of liability.
- **Legal consequences if no appropriate liability system is in place?** The proposal stipulates that the removal activity cannot be certified if no appropriate liability system is in place. The proposal, however, does not regulate the legal consequences if a liability system ceases to function after certification but before the end of the monitoring period. It is also

unclear which the consequences are if the operator does not fulfil the obligation to mitigate risks of reversal.

## 2.6 Certification bodies, certification schemes and certification process

### 2.6.1 Certification bodies

Certification bodies (CBs) play a central role in the CDR certification. The CB conducts the certification audit and - upon satisfactory verification – issues the certificate. The CB is also in charge of the recertification of certificates.

To perform these tasks, the CB must be:

- competent to carry out the audits (Art. 10.2(a)),
- independent of operators and act in the public interest (Art. 10.2.(b)),
- accredited by a national accreditation authority pursuant to Regulation No 765/2008 (Art. 10.1.).

The CB concludes an agreement with a certification scheme to carry out certification audits and subsequently issues certificates. Member States supervise the operation of CBs. In case of non-compliance, Member States inform the CB and the relevant certification scheme thereof without delay (Art. 10.4.).

### 2.6.2 Certification schemes

Certification schemes (CSs) are another central part of the certification process. Operators may only use CSs that are recognised by the Commission.

According to the proposal, a CS is a scheme managed by a private or public organisation that oversees the certification of compliance of operators or groups of operators with this Regulation (Art. 2.1.(k)). CSs must operate on the basis of reliable and transparent rules and procedures set out in an implementing act (Art. 11.2.). The Commission may repeal a decision recognising a CS if the CS fails to implement the obligations set out in the implementing acts (Art. 13.3.).

In addition, the proposal obliges CSs to publish a list of the appointed certification bodies (Art. 11.4.) on at least an annual basis, to maintain a public registry of carbon removal activities and certified carbon removal units. Registries use automated systems (Art. 12.1.). CSs report to the Commission annually about their operations (Art. 14.1.).

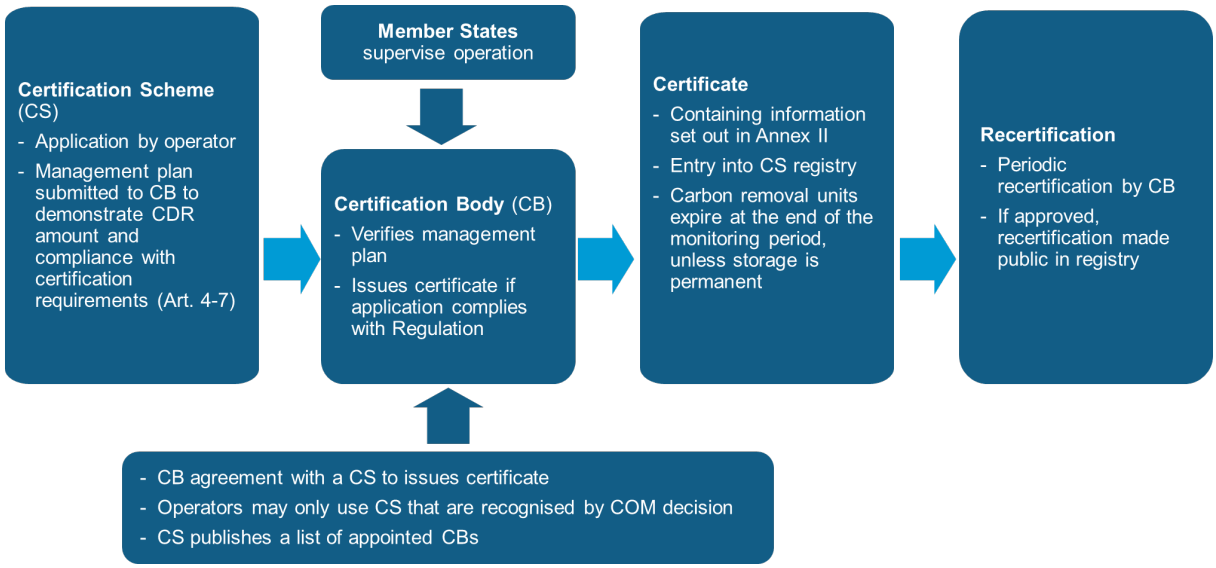
### 2.6.3 Certification process

The proposal contains a three-step application process (Art. 9):

- First, the operator submits the application for certification submitted to the certification scheme. The application must contain a management plan which outlines expected total CDR and carbon removal benefits. The management plan also demonstrates how the removal activity intends to comply with the Regulation.
- Second, the management plan is submitted to the certification body for certification audit. If the certification body confirms compliance, it issues a certificate. The certificates must contain the information set out in Annex II (see below).
- Third, the certified activity is entered into the registry (see below).

To verify the implementation of the management plan, the certification body carries out periodic re-certification audits. The re-certification audits are intended to reconfirm compliance of the carbon removal activity with Articles 4 to 7 and verify the generated carbon benefit. Delegated acts define the details of the certification methodology, including permanence and other important elements of the ECRF. Figure 1 illustrates the certification process in detail.

**Figure 1: Overview of proposed certification process**




Source: Own compilation based on CRCF proposal.

#### 2.6.3.1 Assessment

The proposed certification process raises the question what periodic re-certification means, and whether implementing acts would be a sufficient basis for repealing certification. The proposed public registry is an important feature of the CRCF. An essential element that is missing in Annex II is information about the quantification of certified removals which should be accessible to the public. Making this information public is currently also common practice in the voluntary carbon market.

## 2.7 Power of delegation

The proposal grants the Commission the power to adopt implementing and delegated acts for an indeterminate period (Article 16.2). According to Article 8, the Commission has the power to determine the details of the certification methodology and the content of certificates as set out in Annex II.

The regulation limits the Commission's power to some extent:

- **Scope:** The regulation limits the scope of this mandate only in vague terms. When adopting the delegated act, the Commission must take into account requirements as vaguely defined as the robustness of carbon removals, recognition of the protection and restoration of ecosystems, or minimising administrative burden. It must also take into account Annex I, which includes only broad principles and requirements for necessary content, confirming the Commission's wide discretion.
- **Process:** The regulation also stipulates that the power of delegation may be revoked by the European Parliament or by the Council at any time. The Commission is required to consult experts designated by each Member State in accordance with the Inter-institutional

Agreement on Better Law-Making. Delegated acts only enter into force if Parliament or Council do not object within a period of 2 months of the notification.

### 2.7.1 Assessment

According to Article 290 TFEU, the "**essential elements** "of a legislative act must be reserved for the legislator. Essential elements may not be delegated to the Commission.

The European Court of Justice has ruled that essential elements include provisions "*which are intended to give concrete shape to the fundamental guidelines of Community policy*."[9] Accordingly, the **modification of the material, geographical or temporal scope of a basic act constitutes an essential element** of that act.[10]

Article 16 of the proposal empowers the Commission to regulate the **certification methodology** by delegated act. The certification method includes issues as important as permanence and the use of removal units. Annex 1 is intended to limit the Commission's discretion but it establishes no meaningful limits due to its broad terminology.

In consequence, it is **questionable** whether the proposed article 16 is compatible with Article 290 TFEU. It is hard to argue that defining permanence by the Commission is "non-essential".

[9] Judgment of 27 October 1992, Germany v Commission "German sheep meat", C-240, ECR 1992, p. I 5383

[10] Legal Service, April 2011: Application of Articles 290 (delegated acts) and 291 (implementing acts) TFEU, 8970/1

# 3 Proposal on carbon removal certification: Interaction with EU laws and policies

## 3.1 Examples of legal interaction

The CRCF contains procedural rules; **it does not set material obligations**. As a voluntary framework, the CRCF introduces no obligation to use removal units. It is a tool to certify carbon removals.

Because of its procedural and voluntary nature, the CRCF would have **no immediate effect on the implementation of these EU laws:**

- **European Climate Law:** The European Climate Law (ECL) establishes various climate targets. Among others, these targets require Member States to remove GHG from the atmosphere – quantified in the case of the 2030 climate target, and unquantified in the case of the 2050 target. In either case, Member States do not have to certify these removals according to the rules of the CRCF. For this reason, the CRCF has no immediate effects on the implementation of the ECL.
- **LULUCF Regulation:** Like the ECL, the LULUCF Regulation establishes removal targets for Member States but does not require Member States to certify removals according to the CRCF. However, CRCF does not necessarily ensure visibility and coverage of certified removal actions in GHG inventories. Many Member States' inventory methods are likely not sufficiently granular and accurate to actually reflect certified removal activities, lowering the effectiveness of the CRCF as a policy tool of Member States for increasing removals to meet national targets.
- **Emission Trading Scheme and Effort Sharing Regulation:** The EU ETS Directive currently does not permit the use of removals for complying with the obligations under the ETS Directive. However, for avoided emissions captured and stored geologically, no allowances need to be surrendered (Art. 12.3(a) of the ETS Directive), meaning that fossil CCS can already be used for meeting ETS targets (while they are not occurring at large scale yet). Deliberations on the role of negative emissions technologies in the EU ETS in the future are currently ongoing. Article 9 of the ESR allows the use of up to 280 Mt of LULUCF removal for meeting national targets, but this possibility does not depend on the certification of removals according to the CRCF.
- **Nature Restoration Law:** The Commission's proposal for an EU nature restoration law includes legally binding restoration targets for various ecosystems across the EU. In addition, Member States shall set satisfactory levels for various indicators, including carbon stocks of organic carbon in cropland mineral soils and stocks of organic carbon in forests. This proposal is currently being negotiated. At this point, the CRCF could support meeting objectives relevant for carbon stock in soils, but there are no immediate links between the CRCF and the restoration law – as the restoration law commits Member States while the CRCF does not.

In contrast to these EU rules, the CRCF would have more direct impacts on the **international negotiations under Article 6 of the Paris Agreement**. The proposed CRCF is not compatible with the baselines and quantification rules being discussed in the context of the Article 6 negotiations. The proposed CRCF framework would be weaker than the discussed international

framework (see above). This discrepancy does not render the CRCF illegal – as it is a voluntary framework – but it undermines the EU's position in international negotiations.

## 3.2 Political implications of the CRCF

Although the CRCF has no immediate effects on EU climate rules, it has significant **political implications:**

- **Promoting emission offsetting means jeopardising the integrity of climate action:** The CRCF aims to introduce a certification framework at a time when the EU has not agreed on the role of carbon removals in its overall climate efforts. Apart from the 2030 climate target, it is unclear to what extent the EU intends to use removals to achieve its climate targets – the 2050 climate neutrality target is silent on the share of permissible removals to balance out residual emissions, and the EU has yet to adopt a 2040 climate target.

  In this context of strategic unclarity, it is risky to promote the use of removal units, including the use for offsetting of emissions. Without adequate safeguards that limit the use of carbon removal units and set high standards for their quality, it is conceivable that the CRCF helps put the EU on a dangerous track that allows it to substitute emission reductions with removal units. Such an approach would undermine the integrity of EU climate action.

  Furthermore, substituting emission reductions with carbon removals could deter required mitigation (Carton et al. 2021). There are already proposals to make carbon removals a currency for meeting ETS obligations (Rickels et al. 2022). Such proposals will gain momentum once removals are certified with the authority of EU law. To safeguard the integrity of EU climate action, the EU should not establish a framework of removal certification before a general decision about the role of removals in EU climate efforts has been made.

- **Separate and quantified removal targets necessary:** Separate and quantified removal targets – such as the EU's 2030 climate target – set the eligible amounts of removals and residual emissions. As they are transparent and prevent mixing removals and reductions, they address the concerns of environmental integrity. Their designs facilitate verification, accountability and – ultimately – the environmental integrity of EU climate policies. This design contrasts with the EU's 2050 climate neutrality target – which treats reductions and removals the same.

  It remains to be seen whether or not the CRCF will facilitate the adoption of clearly separate removal targets for the EU. On the one hand, this seems to be a less likely outcome – given the low prices of some removal options and strong interests in using such removals to comply with reduction obligations. On the other hand, the EU's 2030 climate target already sets the precedent for such separate targets – an important safeguard for the integrity of EU climate policies.

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