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Designing an International Peatland Carbon Standard: Criteria, Best Practices and Opportunities

Final report

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Designing an International Peatland Carbon Standard: Criteria, Best Practices and Opportunities

Final report

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Abstract: Designing an International Peatland Carbon Standard: Criteria, Best Practices, and Opportunities

The study presents a comparative analysis of model standards for project development and explores forward-looking options for voluntary peatland carbon engagement, including through integration into regulated carbon markets, notably the emerging offset market for international aviation ("CORSIA"), and the flexibility instruments enshrined in the Paris Agreement.

The study is structured in a context chapter; a detailed comparative assessment of different standards that permit (or may permit) the implementation of peatland projects; in terms of environmental integrity and transaction and market aspects; recommendations for voluntary standards concerning the creation of a model peatland standard and for governments to support voluntary peatland developments; as well as an option assessment for the integration of a model peatland standard into the regulated schemes of the International Organization of Civil Aviation (ICAO) and of the Paris Agreement.

Recommendations for peatland standards focus on simplification options within the carbon cycle, implementation methods for small and micro-scale projects, design options that allow project implementation for short- and mid-term durations, and robust instruments to address double counting issues.

Recommendations for governments focus on the development of domestic support mechanisms for voluntary carbon project development as well as on the option to create international action groups on peatland and climate engagement, taking existing action groups in other mitigation sectors as a model.

Kurzbeschreibung: Designing an International Peatland Carbon Standard: Criteria, Best Practices, and Opportunities

Die vorliegende Studie befasst sich mit den Gestaltungsmerkmalen und -möglichkeiten von Standards zur Entwicklung von Moorklimaschutzprojekten. Dabei geht es zunächst um freiwillige Standards und in einem weiteren Schritt über Möglichkeiten der Übertragung auf regulierte Systeme, namentlich die markbasierten Maßnahmen der internationalen Luftfahrt ("CORSIA") sowie die flexiblen Instrumente des Artikel 6 des Übereinkommens von Paris.

Die Studie beginnt mit einer Darstellung und Einordnung von Moorklimaschutzprojekten. Anschließend werden neun Standards hinsichtlich der Kriterien Umweltintegrität sowie Markt- und Transaktionsgesichtspunkte untersucht. Darauf folgt ein Kapitel mit Empfehlungen an Standards zur weiteren Ausarbeitung ihres Regelwerks im Lichte einer Moor-Standard-Blaupause sowie an öffentliche Stellen im nationalen Kontext zur Begleitung dieses Prozesses und schließlich werden die Möglichkeiten des Transfers in Richtung CORSIA und Handelsoptionen unter Artikel 6 des Übereinkommens von Paris beleuchtet.

Die Empfehlungen an die freiwilligen Standards betreffen Möglichkeiten zur Vereinfachung und Standardisierung einzelner Etappen des Projektzyklus, zum Ausbau von Methoden für Klein- und Kleinstprojekte, zur Ausgestaltung von kurz- und mittelfristigen Projektlaufzeiten sowie zum Aufbau von transparenten Instrumenten zur Klärung von Doppelzählungsrisiken. Die Empfehlungen an Regierungen betreffen die Einrichtung einer nationalen Unterstützungsinfrastruktur zur Begleitung freiwilliger Projektumsetzung sowie die Schaffung einer internationalen Aktionsgruppe zur Umsetzung moorspezifischer Initiativen. Eine solche Aktionsgruppe kann Anleihen nehmen bei ähnlichen Aktionsgruppen und Bündnissen in anderen Minderungssektoren.

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ACR	American Carbon Registry
AFOLU	Agriculture, Forestry and Land-Use
APD	Avoiding Planned Deforestation
A/R	Afforestation / Reforestation
AUS$	Australian Dollars
CDM	Clean Development Mechanism
CCBS	Climate, Community & Biodiversity Standard
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CO_2	Carbon dioxide
COP	Conference of the Parties
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
DOE	Designated Operational Entity
ERF	Australian Emission Reduction Fund
EU ETS	EU Emissions Trading Scheme
FCPF	Forest Carbon Partnership Facility
GS	Gold Standard
GS4GG	Gold Standard for the Global Goals
GS	Gold Standard
GHG	Greenhouse gas
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
ITMO	Internationally Transferred Mitigation Outcome
ITPC	International Tropical Peatland Center
LDC	Least Developed Country
LULUCF	Land Use, Land-Use Change, and Forestry
MF	Moor Futures
MM	max.moor
NACAG	Nitric Acid Climate Action Group
NDC	Nationally Determined Contributions (in Paris-Agreement)
NGO	Non-Governmental Organization
PA	Paris Agreement
PV	Plan Vivo
RBF	Results-Based Finance
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SBSTA	Subsidiary Body for Scientific and Technological Advice
tCO_{2eq}	Tonnes of CO_2 equivalent

ACR	American Carbon Registry
UNFCCC	United Nations Framework Convention on Climate Change
US$	United States Dollars
VCS	Verified Carbon Standard
WDR	Wetland Drainage and Rewetting

Summary

This report – finalized in November 2018 – summarizes global developments in the field of voluntary carbon standards concerning activities to restore and conserve peatlands. It is structured into three main analytical parts.

Voluntary carbon standards offer financial incentives for interventions to reduce emissions or to remove CO2 from the atmosphere. Developed in parallel with, but independently from, the carbon market instruments of government-regulated schemes, voluntary standards have grown broad in scope. Today many of them cover a range of interventions in the forestry, land-use and land-use change sectors. Some – though still few in numbers – have developed specific protocols for peatland interventions.

Comparative Analysis

In the first part of the report, the authors provide an analytical assessment of nine standards, eight voluntary carbon standards and one regulated carbon standard, the Clean Development Mechanism (CDM) of the Kyoto Protocol, with its specific activity window for afforestation and reforestation (A/R). The other voluntary standards are the Gold Standard, the Verified Carbon Standard, Plan Vivo, the American Carbon Registry, the UK Peatland Code (in combination with the UK Woodland Code, as both may integrate in the future), the Australian Carbon Farming Initiative, the German MoorFutures standard, and the Swiss standard max.moor.

The comparative analysis is done against a specific set of characteristics, grouped in two themes, environmental integrity, on the one hand, and marketablility concerned with transactions and markets, on the other hand. As part of the first theme, the authors examine the following criteria, each of them reflecting a core carbon cycle feature:

- Results-based finance;
- Independent validation and verification;
- Monitoring and measurement;
- Additionality;
- Permanence;
- Leakage;
- Double counting (including double claiming); as well as
- Safeguards and co-benefits.

With respect to marketability (transactions and markets), the characteristics used are:

- Balance of supply and demand;
- Credit prices and investment options; as well as
- Options to implement small-scale and micro-based projects.

Results-based financing (or “RBF”) means the principle by which climate finance is distributed *on the condition* that pre-defined climate mitigation achievements from a certain intervention have been achieved and verified. This “ex-post” financing modality is widely applied across

various climate policy instruments and lies at the core of emissions trading (carbon finance) as a whole: An emission reduction (or removal) has to be achieved ("generated"), reported and verified, before it can be issued and transferred. A surprising number of voluntary standards active in the land use, land-use change and forestry (LULUCF) sectors diverge from the RBF principle by offering straight-forward "ex-ante" credits or by going a middle way: Some standards issue *forward credits.* Such forward credits have the advantage of adding a market layer and advancing carbon trades, thereby leveraging financing in a market with high pre-financing needs. However, they also add a level of complexity and may confuse market participants, including concerning the risk of reversal.`

Independent validation of project design and methodological approach, monitoring of results in accordance with the design document, and independent verification of these results are cornerstones of the carbon cycle in both voluntary and regulated standards. All standards under examination follow this model structure. While indispensable from a point of view of environmental integrity, transparency and trust, validation and verification procedures often – for LULUCF projects in particular – represent bottlenecks on the way to carbon credit generation. Expert validators/verifiers are often not available; methodologies are sometimes too rigidly applied rather than tailored to the project at hand. Only the small standards, built around public-private partnerships manage to offer lean validation, monitoring and verification procedures at generally low costs.

A topical concept for climate finance intervention, in general, and carbon project development, in particular, is the principle of additionality. It means in the context of project development that a project would not have occurred in the absence of carbon market incentives, i.e. that it was not the most likely or profitable option and that there were barriers for its implementation. The underlying ratio behind the additionality principle is twofold. First, it is an expression of environmental integrity: If an intervention that would be realized as a normal course of action were to be accounted for as a mitigation effort, the intervention agent's ambition is put in doubt, and any offsetting function really would increase the overall emissions balance. Second, it addresses the need for efficient resource allocation. Carbon finance should be a means to an end. Allocating funds to interventions that have no need creates an inefficient windfall for the recipient and leaves legitimate beneficiaries with less cash to distribute.

While a pressing concern for various economic sectors, securing project additionality presents less of a challenge in many land-use categories, in particular conservation and restoration activities. Yet, additionality tools developed by the various standards are often needlessly complex, and only some offer the kind of standardization approaches that make the additionality test both simple and meaningful.

The risk of reversal (non-permanence) of carbon stocks is widely seen as an inherent feature of LULUCF projects. While the authors argue that the risk of reversal applies to some LULUCF projects (sequestration projects, i.e. projects that create a carbon stock), but not to others (in particular not projects that slow or halt emissions from a pre-existing carbon stock), voluntary standards apply non-permanence rules to all sorts of LULUCF projects. They address non-permanence by building credit buffers – each project feeding them with a share of its credits – and retiring an amount of credits commensurable to the amount of emissions released by a reversal or stock loss event. The different standards apply different buffer shares – from 5% to 60% -- in principle, though in practice most buffer withholdings are between 10%-20%, amounts that have proved wholly satisfactory to cover for events of reversal and stock loss.

A related but distinct topic concerns the longevity of project interventions, i.e. the minimum thresholds for project durations. Long project cycles are good from the perspective of climate-

smart sustainability, yet they can become an obstacle for farmers that are willing to implement a project for 10 or 15 years, but not to commit for a generation, let alone for three or four generations.

Perhaps the least contentious project requirement – in abstract – concerns leakage, i.e. an increase in emissions or a decrease in removals of greenhouse gases outside of the project area as a result of the carbon project's interventions. The concrete determination of leakage emissions and opportune mitigation strategies is arduous, however, and the various standards have established rather different and complex leakage accounting modules. Exceptions apply for those standards – such as max.moor – that concentrate on degraded peatlands, which are no longer in agricultural usage. Ecological leakage risks aside, in these cases, the risk of activity-shifting or market leakage – agricultural production moves on to other peatlands – is not much of an issue. In any event, as the standards demonstrate to a varying extent, leakage can a priori be avoided through a number of mitigation actions.

While the risks of double selling and double issuance are mostly mitigated at a technical level through robust registry systems, both double claiming and double monetization present manifest challenges in the light of the Paris Agreement. With the Paris Agreement intended to lead to a regulated world in which each country accounts for all its GHG emissions across sectors and sets itself reduction targets ("caps"), any voluntary initiative will ultimately show at the national accounting level: An emission reduction achieved through voluntary action reduces the overall national emissions output in the host country. That would allow the relevant country to either claim the relevant emission reduction as a compliance effort under the national target or monetize it (e.g. in line with the flexibility instruments` of the Paris Agreement, in particular Article 6.2).

Both from the perspective of environmental integrity as well as from the perspective of the voluntary market investor, double claiming and double monetization must be avoided. Several standards have established rules how to ensure that the risk of double counting is mitigated, e.g. through an obligation to submit evidence that relevant units have been canceled. Two standards have recently opted to introduce "mitigation statements" as an alternative to credits, where mitigation actions may be not obtainable.

Voluntary standards increasingly react to the expectation from impact investors and the public at large that their investments be adequately vetted against doing harm (safeguards) and that they yield benefits not just in terms of emission reductions, but in terms of other ecosystem services. As with other land-use projects, adequately identifying the environmental and social impacts, risks and opportunities of a project intervention has become a high demand-driven priority. The voluntary standards under discussion respond to this growing expectation at varying degrees.

On the side of transactions and market considerations, peatland credits take a special place. While price spreads between project types are the rule in all of the standards under examination (save those that target peatland interventions only), most LULUCF projects can usually compete at average credit prices below US$ 10. This represents a price level, which many peatland projects – especially those in industrialized countries, which currently trade at prices between US$ 40 and 90 per tonne – will struggle to meet.

Regardless of price spreads, securing funding represents a challenge for carbon projects across standards. Australia's Carbon Farming Initiative shows how governments can help develop a rich project portfolio by offering 10-year funding to projects selected through reverse auctions.

A specific opportunity for peatland projects – yet under-realized by all of the standards under assessment yet – lies in the combination of peatland restoration and conservation with paludiculture techniques: agricultural ways to use wet soils productively, e.g. for alder cultivation or sphagnum farming.

A separate challenge for carbon project development is related to minimum size expectations. Given the complexities of the carbon cycle and the high transaction costs, especially among the bigger international standards, projects are often not judged feasible unless implemented on hundreds or thousands of hectares. Across industrialized countries, however, peatland areas available for restoration are often below 100 hectares. The international standards offer few opportunities to small or micro-scale projects. The smaller domestic standards fare better in this respect. Small- and micro-scale solutions combine simplified procedures and low-cost options for validation and verification cycles.

Recommendations

In the second part of the report, the authors elaborate wide range of recommendations for voluntary standards. They target both the carbon cycle procedure as well as key methodological elements for peat carbon project development. Standards should, as a priority:

1. Allow a more flexible, "modular" use of methodologies by project proponents, linked to a closer "peer-to-peer" engagement between proponents and validators and supported by pragmatic, proxy-based monitoring options.
2. Encourage small- and micro-level projects by developing off-the-shelf and flexible project design, validation, monitoring and verification formats, allowing for low-end validation and verification costs.
3. Offer short- and mid-term project solutions. 30, 40 or 100-year-permanence requirements make sense for many land-use projects (in particular: A/R and forest management) but they fail to recognize the permanent climate benefit that many short- to medium-term soil carbon interventions have. This is a lost opportunity. Many farmers will be hostile to committing to a certain land-use for several generations; making a similar commitment for 10, 15 or 20 years faces a lot less concern.
4. The authors recommend to reconsider buffer functions: Either remove the buffer requirement for emission reduction projects altogether or at the very least adjust the buffer withholding to the stock loss risk inherent in a peatland conservation or restoration project. A withholding of 10% is tailored to the specific (and low) risk of stock loss inherent in peatland projects.
5. Encourage the development of a methodological paludiculture toolbox tailored to the combination of peatland conservation/restoration, on the one hand, and agriculture use, on the other hand. The aim should be that standards provide methodologies that permit the combinations of project categories, so that the biomass component in reeds, sphagnum, alder etc. can be accounted for, including in the context of biomass replacing fossil fuel.
6. Prepare individual double counting assessments for each country. Where the emission reductions achieved from a peatland conservation or restoration project are not reflected in an NDC or another national or jurisdictional accounting systems, there is no risk of double claiming for peatland projects. However, the introduction of a sunset provision for projects may be useful in order not to set the wrong incentives for countries (to hold off with comprehensive NDC accounting). Where the emission reductions are or may be accounted for under an NDC or another system, offer a clear set

of options to address the risk ("corresponding adjustments", "statements" instead of credits; introduction of mechanisms that link project credits to replacement credits).

7. Apply both a safeguards protocol and offer additional certification services. Peatland projects are high-impact projects not just in terms of emission reductions, but also in terms of biodiversity, water economy, climate change adaptation, gender equality, and other. These translate in additional benefits of peat carbon credits which are valued by buyers.

Voluntary carbon markets have been developed by non-state-actors, and they function outside any government-regulated system. This notwithstanding, there is plenty governments can do to support voluntary markets, short of turning them into regulated schemes proper. Governments may want to consider, in particular, to:

1. Establish a peatland climate protection fund that invests in projects through purchasing credits under a reverse auction mechanism and that provides collateral, seed or bridge funding for projects in their early development phase to trigger required investments. The fund could also provide support for project proponents on the side of marketing and market-place creation, as well as registry, post-development and risk pooling services.
2. Facilitate the establishment of professional program coordinators to take on the role as program/project proponents and provide support to program roll-out for small- and micro-scale projects across jurisdictions (regions) or countries. Facilitation and support could come, in particular, in the form of information and help desk services, scientific and operative (including cross-regional) assistance, as well as financial support.

Moving into Compliance Markets

There are various opportunities for peatland projects to transfer from voluntary carbon cycles into regulated regimes. The most concrete options at this moment are (1) the offset mechanism under development for the aviation industry, the Carbon Offsetting and Reduction Scheme for International Aviation ("CORSIA"), and (2) the flexibility instruments under development for use within the Paris Agreement ("Article 6 PA Instruments").

Though CORSIA and the Article 6 PA Instruments – both can be deemed regulated market measures – are still not fully defined in their requirements and their conceptual approach, from available draft negotiation texts certain observations may be made: First, there is wide equivalence between the principles and models of peatland carbon project development as explored as part of Part I and Part II. above. Second, challenges relate to proper market considerations, namely size and security of supply as well as price expectations per tCO_2e.

The authors recommend that existing standards seek integration in larger programs that are, or may be, fast-tracked into CORSIA. The *Forest Carbon Partnership Facility* (FCPF) as well as the largest standard-setter on the voluntary market, Verra, may be of particular interest in this respect, and they were included in a CORSIA testing program to that effect.

The authors also advise that governments – jointly with non-state actors including the voluntary standards themselves – should promote peatland-based emission reduction transactions through the creation of a multi-party international action group. Such an action group could replicate (aspects of) the recently created four-country Global Peatland Initiative and focus on providing assistance to project-level interventions both in industrialized and in developing countries, as well as working towards better accounting for peatland emissions within NDCs.

Zusammenfassung

Entwicklung eines internationalen Moorklimaschutz-Standards: Praxiserprobte Bausteine und Handlungsmöglichkeiten

Die vorliegende (im November 2018 abgeschlossene) Studie befasst sich mit den Gestaltungsmerkmalen und -möglichkeiten von Standards zur Entwicklung von Moorklimaschutzprojekten. Dabei geht es zunächst um freiwillige Standards, also solche, die kein reguliertes Emissionshandelssystem darstellen und vollständig oder wesentlich auf private Initiative zurückgehen. In einem weiteren Schritt geht es dann auch um Möglichkeiten der Übertragung auf regulierte Systeme, namentlich die marktbasierten Maßnahmen der internationalen Luftfahrt ("CORSIA") sowie des Artikel 6 des Übereinkommens von Paris.

Vergleichende Analyse

Klimaschutzstandards zielen auf die Umsetzung von Emissionsreduktionsmaßnahmen und im Falle von Landnutzungsprojekten auch von Emissionseinbindungen ab. Sie stellen Methoden zur Ermittlung der konkreten Emissionsreduktions- bzw. Senkenwirkung bereit und erlauben die Ausschüttung von Zertifikaten für erreichte CO2-Minderungserfolge. Die Zertifikate sind in besonderen Registern frei handelbar.

Die Studie teilt sich in drei Schwerpunkte. Zunächst werden neun verschiedene Standards – acht freiwillige Standards sowie ein regulierter Standard, der Clean Development Mechanism (CDM) des Kyoto-Protokolls in seiner spezifischen Ausprägung als Standard für Auf- und Wiederaufforstungsmaßnahmen (A/R) – auf Gemeinsamkeiten und Unterschiede hin untersucht. Bei den acht freiwilligen Standards handelt es sich um den Gold Standard, den Verified Carbon Standard (VCS), Plan Vivo, den American Carbon Registry (ACR) Standard, den UK Peatland Code (den die Verfasser für die Zwecke der vergleichenden Betrachtung um Merkmale des UK Woodland Code ergänzt haben)[1], die australische Carbon Farming Initiative, den deutschen MoorFutures-Standard sowie den schweizerischen max.moor-Standard. Nur der VCS, ACR, der UK Peatland Code, MoorFutures and max.moor haben bereits Erfahrung mit moorschützenden Projektmaßnahmen.

Die vergleichende Betrachtung der Standards erfolgt entlang einer Reihe von Kriterien, die sich zum einen dem Grundsatz der Umweltintegrität, zum anderen Markt- und Transaktionsgesichtspunkten zuordnen lassen. Im Rahmen der Umweltintegrität geht es um wesentliche Schritte und Aspekte des Klimaprojektzyklus, nämlich:

- Ergebnis-basierte Finanzierung
- Unabhängige Validierung und Verifizierung
- Messung und Überwachung (Monitoring)
- Zusätzlichkeit
- Permanenz
- Verlagerung von Emissionen
- Doppelzählung (einschließlich -anrechnung) sowie

[1] Die für beide Standards, UK Peatland Code und UK Woodland Code, verantwortlichen Organisationen bzw. Stellen prüfen derzeit ihre Zusammenlegung.

- Schutzvorkehrungen und Zusatzwirkungen.

Hinsichtlich von Markt- und Finanzierungssaspekten nimmt die Untersuchung vor allem das Folgende in den Blick:

- Verhältnis von Angebot und Nachfrage
- Preisniveaus und Investitionsvarianten sowie
- Möglichkeiten der Verwirklichung von Klein- und Kleinstprojekten.

Ergebnis-basierte Finanzierung meint den Grundsatz, wonach Klimafinanzierung nur auf Grundlage und nach Bestätigung erreichter Emissionsreduktionen (oder Senkenleistungen) erbracht wird. Das Prinzip der Herausgabe von Zertifikaten nach Eintritt der Emissionsreduktionen („ex post“) ist im verpflichtenden Markt ein zentraler Bestandteil eines Klimaschutzprojektes. Allerdings weichen diverse freiwillige Standards von dem Grundsatz der ergebnis-basierten Finanzierung ab. Manche kehren ihn ins Gegenteil und geben Zertifikate vor der Projektumsetzung heraus. Manche gehen einen Mittelweg, indem sie sowohl Ex-ante-Zertifikate und Ex-Post-Zertifikate ausschütten; erstere haben dann nur vorläufigen Charakter. Die Abweichung vom Grundsatz ergebnis-basierter Finanzierung dürfte häufig motiviert sein von dem Ansinnen, möglichst früh in der Projektentwicklung Finanzierungshilfen zu erreichen. Ex-Ante-Zertifikate ermöglichen frühe Leistung der Projektentwickler und im Gegenzug eine vorgezogene Leistung seitens der Käufer. Allerdings geschieht dies um den Preis gesteigerter Komplexität und Intransparenz (nicht zuletzt betreffend ein späteres Ausfallrisiko der Minderungsleistung). Zertifikate auf zukünftige Emissionsreduktionen bergen jedenfalls Risiken, die nicht immer allen Seiten klar sind.

Die unabhängige Prüfung von Projektplänen samt methodischem Vorgehen („Validierung), detailliert festgelegte Messabläufe („Monitoring“) und die wiederum unabhängige Überprüfung der Messresultate und der einzelnen Messdaten („Verifizierung“) gehören zu den Grundpfeilern der Klimaschutzprojektentwicklung. Sie leisten Gewähr, dass Projekte echte und nachgewiesene Emissionsreduktionen erbringen, und sind deshalb im Grundsatz unabkömmlich. Allerdings zeigt sich in der Praxis, dass der komplexe Projektzyklus aus Validierung, Monitoring und Verifizierung durchaus anspruchsvoll ist. Expertenwissen ist nicht immer greifbar, und etliche Prüfschritte verzögern sich leicht. Insgesamt werden Verfahren manchmal unnötig formalistisch und allgemein gehalten, statt die Besonderheiten des jeweiligen Projekts in den Blick zu nehmen. Nur den kleinen, national eingebetteten Standards gelingt es, durchwegs schlanke Verfahren bei geringen Transaktionskosten anzubieten.

Ein Kernkonzept des Emissionshandels mit Gutschriften betrifft die sogenannte Zusätzlichkeit der betreffenden Maßnahme. Zusätzlich sind Projekte, die ohne das Anreizsystem des Emissionshandels nicht verwirklicht würden, weil sie weder das gewinnträchtigste unter verschiedenen Entwicklungsszenarien darstellen noch sonst (aller Wahrscheinlichkeit nach) verwirklicht würden. Die zugrundeliegende Ratio des Zusätzlichkeitsgebots ist eine doppelte: Zum einen ist es unmittelbarer Ausfluss der Umweltintegrität: Wenn eine Maßnahme ohnehin verwirklicht würde, verfehlen die Zertifikate als Beleg echter Emissionsreduktionen ihre eigentliche Bedeutung. Werden sie zur Kompensation genutzt, bewirken sie zudem indirekt – im Saldo – einen Mehrausstoß. Zum anderen geht es um das Interesse effizienter Verteilung von Klimageldern. Gelder, die unnötig aufgewendet werden für einen Zweck, der ohnehin erreicht würde, fehlen an anderer Stelle.

Das Zusätzlichkeitsgebot ist von zentraler Bedeutung für die innere Wirksamkeit eines jeden Gutschriftssystems. Allerdings sind die Risiken bei Landnutzungsprojekten beschränkt. Für Moorschutzprojekte – jedenfalls für solche, die Renaturierung zum Ziel haben – stellt sich kaum je die Wirtschaftlichkeitsfrage. Sie sind regelmäßig weniger ertragreich als die Nutzung der Flächen im entwässerten Zustand. Die jeweiligen freiwilligen Standards berücksichtigen diesen Umstand nicht immer. Manche erfordern eine hochkomplexe, individualisierte Zusätzlichkeitsprüfung, obwohl Formen der Vereinfachung und Standardisierung (wohlgemerkt nur bezogen auf die hier betrachteten Projekttypen der Moorwiedervernässung und des Moorschutzes) angezeigt wären.

Das Risiko der Dauerhaftigkeit (fehlende Permanenz) wird zumeist als ein inhärentes Problem aller Landnutzungsprojekte gesehen. Die Verfasser sind hier anderer Auffassung: Sie sehen das Permanenzrisiko nur als ein inhärentes Problem von Senkenprojekten, bei denen der grundsätzlich reversible Senkengewinn gutgeschrieben wird. Bei Emissionsreduktionsprojekten ist dies anders. Hier wird die Vermeidung oder Verlangsamung eines Senkenverlusts gutgeschrieben. Eine derartige Vermeidung oder Verlangsamung hat immer eine Langzeitwirkung. Zwar kann ein nachträglicher kompletter Senkenverlust die Emissionsreduktionswirkung überlagern. Das ist aber in industriellen Projekten oder in Projekten, bei denen fossile Brennstoffe eingespart werden, nicht anders. Hier kann ein nachträglicher Mehrausstoß die zuvor erzielten Emissionsreduktionen ebenfalls der Menge nach aufheben.

Die untersuchten Standards folgen wiewohl sämtlich der herrschenden Auffassung, wonach Emissionsreduktions- und Senkenprojekte einem Permanenzrisiko ausgesetzt sind. Anders als der CDM lösen sie dieses Problem aber einheitlich über die Einrichtung eines Sicherheitspuffers. Wird in dem Projekt Kohlenstoff vorzeitig freigesetzt, wird eine entsprechende Anzahl an Zertifikaten aus der Sicherheitsreserve endgültig stillgelegt. Dabei unterscheiden sich die Standards, was Ansatz und Kalkulation des angeht. Sie reichen von 5% (Carbon Farming Initiative) bis zu 60% (VCS), wobei allerdings in der Praxis ein Rückbehalt von 10%-20% die Regel ist. Der Fall, dass sich ein Risiko verwirklicht, ohne vom Puffer vollständig gedeckt zu sein, hat sich bisher nie verwirklicht.

Ein weiteres Problem betrifft die Projektlaufzeit (die nicht unbedingt mit dem Zeitraum, für den Gutschriften erworben werden können, zusammenfallen muss). Die Standards geben sich uneinheitlich, was Mindestanforderungen für die Langfristigkeit der Maßnahmenumsetzung betrifft. Manche Standards fordern Gewissheit, dass die jeweilige Maßnahme für 40 oder gar für 100 Jahre bestehen bleibt. Anderenfalls kann eine Eintragung als Minderungsprojekt und eine Ausschüttung von Gutschriften nicht erfolgen. Derlei Langzeitvorgaben haben beträchtliche Auswirkungen auf die Umsetzung und die Kosten. Im für Moorschutzprojekte besonders kritischen Bereich der Landwirtschaft dürfte es viele Beteiligte (insbesondere Landwirte) geben, die der Aufgabe ihrer Flächennutzung (bzw. eines Teils ihrer Flächen) für 40 oder gar 100 Jahre skeptisch gegenüberstehen. Manche könnten sich aber durchaus gewinnen lassen, einen Teil ihrer Flächen zur Wiedervernässung für 10 oder 15 Jahre zur Verfügung zu stellen.

Als kaum streitig ist die Gestaltung des Verlagerungsrisikos anzusehen. Führt ein Klimaschutzprojekt zu einem Anstieg von Emissionen außerhalb der eigenen Projektgrenzen, sind diese zusätzlichen Emissionen anzurechnen. Die Bestimmung des Verlagerungsrisikos ist allerdings regelmäßig schwierig und umständlich, wobei die jeweiligen Standards je eigene Grundsätze der Berechnung entwickelt haben. Einfach und schematisch ist es allein für den max.moor-Standard. Der zieht nur Moorflächen in Betracht, die degradiert und der landwirtschaftlichen Nutzung dauerhaft entzogen sind. Eine Verlagerung landwirtschaftlicher Produktion und entsprechend entwässerter Flächen kann es hier nicht geben. Allerdings wird

das Risiko der sogenannten ökologischen Verlagerung offenbar nicht für beachtlich gehalten. Das Beispiel max.moor ist dennoch interessant, insofern es zeigt, dass das Problem der Verlagerung je Projekttyp und -kontext verschieden sein kann.

Das Verbot der Doppelzählung – ein Grundsatz, der regulativen wie freiwilligen Systemen gemein ist – schließt die Fälle der doppelten Veräußerung, Vermarktung und der doppelten Ausstellung sowie zusätzlich den Fall der doppelten Anrechnung ein. Nur der letzte Fall – der Fall der doppelten Anrechnung – gibt wirklich Probleme auf, zumal im Kontext des Übereinkommens von Paris und der zunehmenden Praxis der nationalen Anrechnungsziele. Die untersuchten Standards stehen hier oft noch am Anfang der Analyse. Gold Standard und VCS haben jüngst angekündigt, Projektentwicklern die Option zu eröffnen, die Emissionsreduktionen nurmehr zu berechnen und zu zertifizieren, allerdings keine handelbaren Zertifikate auszuschütten.

Einige der untersuchten Standards richten sich verstärkt an der Erwartung von „Impact"-Investoren (nachhaltiges Investment) aus, Maßnahmen nur umzusetzen, wenn hinreichend Vorkehrungen gegen diverse Gefahrentatbestände – Umweltfolgen, räumliche Dislozierung, sozio-kulturelle Verluste etc. – ergriffen wurden. Investoren legen auch zunehmend Wert auf die Realisierung von sogenanntem Zusatznutzen (z.B. bei Umweltschutz und Artenvielfalt, Anpassungskomponenten und anderem). Dem versuchen einige der Standards mit dem Angebot quantitativer oder qualitativer Evaluierung von Zusatznutzen zu entsprechen.

Auf Seiten von Markt- und ist besonders die Höhe der Preise von Moorschutzprojekten (jedenfalls solchen in Industriestaaten entwickelten) und anderen Landnutzungsprojekten, die durchschnittlich für unter US$ 10 verkauft werden, auffällig. Tonnenpreise für Gutschriften belaufen sich von US$ 40 (unteres Preissegment bei MoorFutures) bis zu US$ 90 (max.moor).

Die Nachfrage nach Gutschriften aus Moorklimaprojekten, jedenfalls im größeren Stil, ist entsprechend noch ungewiss. Das Beispiel der australischen Carbon Farming Initiative freilich zeigt, wie mit dem Problem unklaren Absatzes generell unter Einbindung staatlicher Steuerungsinstrumente umgegangen werden kann. Der hinter der Initiative stehende Emissionsreduktionsfonds ersteigert im Wege der Vergabeauktion Gutschriften und sichert dadurch Projekten die Abnahme über 10 Jahre. Das Programm ist offen für diverse landwirtschaftliche Projekttypen; Moorprojekte sind bisher nicht im Programm vertreten.

Für Moorprojekte von besonderer Bedeutung dürften Bemühungen sein, sog. Paludikulturen, d.h. Landnutzungsarten unter feuchten Bedingungen, zu etablieren. Damit einher geht das Interesse, Moorgebiete nicht vollständig aus der landwirtschaftlichen Nutzung zu nehmen, sondern Wiedervernässung und Nutzung – etwa über die Kultivierung von Sphagnum oder den Anbau von Erlen – zu kombinieren.

Ein eher technisches Problem stellt das Bedürfnis dar, Projektformate zu schaffen, die Klein- und Kleinstprojekte (ein- bis zweistellige Hektarzahlen) zulassen. Hier geht es im Wesentlichen um vereinfachte und flexible Verfahren bei der Programmbeschreib, der Messdatenerhebung sowie bei der Validierung und der Verifizierung. Die internationalen Standards haben sich derartigen Projektformaten bisher nur ansatzweise geöffnet. Die kleineren, national verankerten Standards leisten hier mehr.

Empfehlungen

Im zweiten Teil der Studie geben die Verfasser Empfehlungen für die künftige Ausgestaltung freiwilliger Moorschutzstandards bzw. freiwilliger Standards ab, die Moorklimaschutzmaßnahmen zulassen. Standards sollten nach Ansicht der Verfasser vor allem in folgenden Bereichen aktiv werden:

1. Erarbeitung methodischer Module und Bausteine, die Projektentwickler den individuellen Projektbedürfnissen entsprechend kombinieren können. Die individuelle Kombinationslösung (für jedes Projekt) sollte verbunden werden mit einem „Peer-to-Peer"-Prozess zwischen Entwicklern und Validierern und einem grundsätzlich offeneren Umgang mit flexiblen Messverfahren.
2. Bestimmung dezidierter Klein- und Kleinstformate für die Projektentwicklung mit standardisierten Projekt-/Programm-Formaten; dazu schlanke Validierungs-, Mess- und Verifizierungsverfahren (gerade mit Blick auf eine Reduzierung der Transaktionskosten).
3. Angebot von kurz- und mittelfristigen Projektlaufzeiten: 10-, 15- oder 20-Jahr-Zyklen unter dem ausdrücklichen Vorbehalt, dass anschließend zur früheren Nutzung zurückgekehrt werden kann. Ein solcher Schritt dürfte die Bereitschaft von Landwirten und anderen Nutzern erhöhen, Flächen für Moorschutzmaßnahmen bereitzustellen. Er dürfte gleichzeitig die entsprechenden Kosten für die Durchführung der Moorschutzmaßnahme spürbar senken.
4. Neujustierung des Sicherheitspuffers: Standards sollten erwägen, die Sicherheitsreserve für Emissionsreduktionsprojekte (nicht aber Senkenprojekte) gänzlich zu streichen. Mindestens aber sollte der Puffer bei Moorschutzprojekten konkret nach dem Risiko des kompletten Senkenverlusts berechnet werden. Dieses Risiko dürfte grundsätzlich nicht mit mehr als 10% Sicherheitsreserve zu Buche schlagen.
5. Entwicklung einer „Toolbox" für Paludikulturen, die für eine Kombination aus Moorschutz und –renaturierung auf der einen Seite und Paludikultur auf der anderen Seite zugeschnitten ist. Manche Standards lassen heute schon die Kombination mehrerer Projekttypen und methodischer Berechnungsarten zu. Allerdings berücksichtigt noch kein Standard die besondere Kombination von Wiedervernässung und Nutzung durch Paludikultur. Hier herrscht methodischer Umsetzungsbedarf gerade mit Blick auf die Einbeziehung des Biomasseersatzes für fossile Brennstoffe.
6. Bewertung und transparente Darstellung von Doppelzählungsrisiken je nach Staat bzw. Gebietskörperschaft, bezogen auf den jeweils betreffenden Projekttyp. Hier geht es in erster Linie um einen Abgleich der nationalen Ziele („NDCs") bzw. den betreffenden nationalen Maßnahmen und freiwilligen Projekten. Wird eine freiwillige Emissionsreduktionsmaßnahme nicht in dem betreffenden NDC abgebildet, entfällt das Risiko doppelter Anrechnung. Hier bleibt die Projektumsetzung unproblematisch, wobei allerdings die Einführung einer Verfallgrenze zu erwägen ist (anderenfalls schüfe man die falschen Anreize für Staaten, die betreffenden Emissionen aus dem eigenen NDC konsequent herauszuhalten). Umgekehrt sollten Standards in Fällen der doppelten Anrechnung (bzw. wo sich die Gefahr doppelter Anrechnung stellt) handfeste Optionen zur Behandlung des Doppelzählungsrisikos bereitstellen, darunter die Option des „korrespondierenden Abzugs" in dem eigenen NDC, die Option des zertifizierten Berichts (ohne Ausschüttung von Zertifikaten) sowie die Option der Ersatz-Stilllegung (etwa von CDM-Zertifikaten).
7. Annahme eines robusten und gleichzeitig praxisnahmen Protokolls über Schutzvorkehrungen („Safeguards") sowie die Ausweitung des Zertifizierungsangebots auf zusätzliche Bereiche. Moorprojekte liefern regelmäßig gute Ergebnisse, was den Erhalt der Biodiversität, Wasserhaushalts, Anpassungswirkungen, Gender-Gerechtigkeit

etc. angeht. Solcher Zusatznutzen, sofern er sich fundiert nachweisen lässt, dürfte den Wert von Moorgutschriften für Zertifikate-Käufer substantiell erhöhen.

Freiwillige Standards sind aus privater Initiative entstanden, und sie stehen dementsprechend außerhalb von Verpflichtungssystemen. Trotzdem können staatliche Stellen freiwillige Standards in ihrer Arbeit und der Nachfrage nach ihnen dezidiert unterstützen. Die Verfasser empfehlen, dass staatliche Stellen vor allem das Folgende erwägen:

1. Einrichtung eines Moor-Klimaschutz-Fonds: Ein solcher Fonds würde schwerpunktmäßig Finanzierunghilfen für Projekte leisten, allerdings auf Zertifikate-Basis, also unter strikter Anwendung des Grundsatzes ergebnis-basierter Finanzierung. Der Fonds würde daneben auch zur Verfügung stehen, um Bürgschaften und sonstige Garantien für Projekte abzugeben, die Vorausfinanzierung von privaten Investoren/Käufern erhalten. Zudem könnte der Fonds Projektentwickler bei der Vermarktung, Registrierung und der langfristigen Projektbetreuung unterstützen.
2. Förderung professioneller Programm-Koordinatoren und Programmumsetzungsmaßnahmen. Die Förderung könnte etwa in Form von Informations- und Help-Desk-Begleitung, wissenschaftlicher und operativer Beratung (auch in länderübergreifender Perspektive) sowie über finanzielle Unterstützung erfolgen.

Transfer in Verpflichtungsmärkte

Eine Reihe von Szenarien sind denkbar, wie der Transfer von freiwilliger Projektentwicklung im Bereich Moorklimaschutz hin zu staatlich regulierten Systemen vollzogen werden kann. Konkret bieten sich zwei Wege an: Zum einen über den Kompensationsmechanismus der Luftfahrtindustrie („CORSIA“), der gegenwärtig in der Entwicklungsphase steht, zum anderen über die Einbringung von Moorklimaschutzprojekten in die Instrumente des Artikel 6 des Übereinkommens von Paris.

Obwohl beide Systeme noch nicht voll entwickelt sind, zeichnet sich nach den bisher bekannten Dokumenten und Verhandlungs-Texten die grundsätzliche Integrierfähigkeit von Moorklimaschutzprojekten und Moorklima-Standards ab. Das gilt jedenfalls, insofern die oben behandelten Grundsätze und Empfehlungen von den einzelnen Standards umgesetzt werden.

Herausforderungen dürften sich eher auf Ebene der Implementierung und unter Berücksichtigung von Marktaspekten einstellen. Moorschutzprojekte sind vergleichsweise unerprobt. Die Replizier- und Skalierfähigkeit ist unklar. Preislich sind Projekte – jedenfalls in Industriestaaten – teuer. Das alles macht sie eventuell wenig attraktiv für ein Programm wie CORSIA, das verhältnismäßig schnell eine große Menge sicherer Klimaschutzprojekte bzw. -Programme identifizieren, prüfen und umsetzen muss. Aber auch für den zwischenstaatlichen Handel unter den Artikeln 6.2 und 6.4 des Übereinkommens von Paris sind die Chancen auf baldigen Transfer nicht unbedingt gegeben.

Die Verfasser empfehlen insofern, dass bestehende Standards Kooperationen mit passenden Programmen eingehen, die ihrerseits der Einbindung unter CORSIA Vorrang einräumen. Hier bieten sich insbesondere das Programm der Forest Carbon Partnership Facility (FCPF) und der nach Projekten größte freiwillige Standard, Verra, an. (Beide Standards wurden in das Testverfahren unter CORSIA aufgenommen.) Weiter empfehlen die Verfasser, dass Regierungen und nicht-staatliche Stellen (einschließlich eventuell Standards) sich unter einem Moorklimaschutz-Aktionsbündnis zusammenschließen. Ein solches Bündnis könnte sich an der kürzlich von vier Staaten gegründeten Global Peatland Initiative orientieren und sowohl

Projekthilfe in globaler Perspektive sowie Unterstützung bei der Verbesserung der NDC-Bilanzierung leisten.

1 Introduction

The German Federal Environment Agency has commissioned Silvestrum Climate Associates, LLC., and Duene e.V. to prepare a study taking stock of global developments in the field of voluntary peatland standards. The study presents a comparative analysis of model standards for project development and explores forward-looking options for voluntary peatland carbon engagement, including through integration into regulated carbon markets, notably the emerging offset market for international aviation, and the flexibility instruments enshrined in the Paris Agreement.

As part of the analysis, a workshop with negotiators and practitioners was organized on the sidelines of the UNFCCC negotiations in May 2018 (Bonn, Germany). The main research for the study was completed in August 2018.

The study is structured in a context chapter (chapter 2), a detailed comparative assessment of different standards in terms of environmental integrity and transaction and market aspects (chapter 3), recommendations for the creation of a model peatland standard (chapter 4), and an option assessment for the integration of a model peatland standard into the regulated schemes of the International Organization of Civil Aviation (ICAO) and of the Paris Agreement (chapter 5).

The comparative analysis includes a number of voluntary standards that do not have peatland projects in their scope of activities or that do not currently offer accounting methodologies for peatland restoration or conservation interventions. They are presented, nonetheless, for their innovative features in their methodological or project cycle approach.

This study is limited to project approaches within confined geographic boundaries. It does not assess initiatives or standards focusing on supply-chain, lifecycle, or organizational interventions aiming at indirect land-use based emission reductions or removals. Though of considerable importance in their own right – and stimulating a growing demand, including from traditional carbon offset buyers –[2] such interventions have no direct link to a specific "project" site and, thus, fall outside the focus of this assessment.

[2] See the 2017 survey by Hamrick, K. / Gallant, M., State of the Voluntary Carbon Markets 2017. The survey detects an increasing demand for certification under ISO 14064. While this standard allows for measurements of direct project interventions, it also addresses indirect (organizational) effects on land-use based emissions, see chapters 3.2.4 and 3.2.5, at https://www.iso.org/obp/ui/#iso:std:iso:tr:14069:ed-1:v1:en:sec:B.

2 Context: Peatland Carbon Standards – A Concept Designed by Non-State Actors

The following chapter provides an overview of voluntary carbon standards operating in the land-use sector. It highlights those that provide accounting methodologies for peatland conservation and restoration.

2.1 Peatlands: The Potential

Drained peatlands emit massive amounts of carbon (CO2). Rewetting peatlands is a way of conserving carbon, i.e. of avoiding emissions; it does not necessarily sequester carbon. The sequestration benefit is secondary, in any case, realized over long periods of time only. This makes peatland restoration an emission reduction activity similar in nature to projects that reduce deforestation and forest degradation (REDD+), not forest restoration (afforestation and reforestation or "A/R").

Despite their genuine importance for climate change mitigation and adaptation, tailored climate finance instruments to reduce CO2 emissions from drained peatlands happen only rarely, and their place remains on the fringes of global climate policy making. It is estimated that several hundred million tonnes of CO2e may be reduced globally each year through rewetting.3 Curbing the rate of destruction and degradation of pristine peatlands could add another several hundred million tonnes of CO2e reductions4.

Unlike global emissions from deforestation, peatland-related emissions are not primarily a developing country phenomenon. More than 400 million tonnes of CO2e are released every year from peatland emissions in Europe and North America alone.5 The main drivers of degradation on both sides of the Atlantic are agricultural use, infrastructure, and construction.6

While not all emissions are avoidable – food needs to be produced, economies rely on roads and train tracks, people require housing and work spaces – most are. Improved zoning, restoration of floodplains, and careful selection and management of agricultural soils according to their natural characteristics would go a long way to reduce the quantity and depth of peat drainage systems and to rewet – at least partially – many millions of hectares peatlands that are drained today.

2.2 Emission Trading: Direct and indirect coverage

Setting smart incentives for farmers and other land users to conserve pristine peatlands and rewet those that are drained is a key challenge for policy makers across the globe. Emissions trading and carbon taxes offer important policy options to set financial incentives across economic sectors.[7] For the agricultural sector, though, their potential has so far been left largely

[3] Joosten, H., The Global Peatland CO_2 Picture, Wetlands International 2010, at https://www.wetlands.org/publications/the-global-peatland-co2-picture/.

[4] Joosten, H. 2017 The development of peatland emissions until 2030: a reconnaissance. IMCG Bulletin September 2017: 4-8. http://www.imcg.net/media/2017/imcg_bulletin_1709.pdf.

[5] Wetlands International 2016 Peat for speed in land sector mitigation and adaptation, at http://www.imcg.net/media/2016/imcg_bulletin_1611.pdf.

[6] Peters, J. / von Unger, M., Peatlands in the EU Regulatory Environment (BfN 2017), at https://www.bfn.de/fileadmin/BfN/service/Dokumente/skripten/skript454.pdf.

[7] Stern, N., The Economics of Climate Change (2006). Harris, J. / Roach, B. / Codur, A.-M., The Economics of Global Climate Change (2017), at http://www.ase.tufts.edu/gdae/education_materials/modules/The_Economics_of_Global_Climate_Change.pdf.

untapped. This is often due to a choice in political priorities,[8] but it also owes to perceived technical difficulties concerning the capacity to measure land carbon fluxes, the complexity of understanding and addressing the risk of carbon stock loss ("non-permanence" of emission reductions), and the sheer number of areas/installations necessary to trace emissions and to monitor fulfilment of compliance obligations.[9] While the European Emissions Trading Scheme (EU ETS), which focuses on industrial emissions and emission from energy production, mandates compliance obligations for just 12,000 installations across the European Union, the number of agricultural holdings across the EU is 10.8 million, and the number of farms with a size larger than 100 hectares is still in the range of 340,000.[10] Including them directly in the EU ETS or separate mandatory trading scheme would be challenging.

Yet, for regulators there is also the option to link a certain sector and certain sector activities indirectly to an emissions trading scheme, i.e. through the use of a "baseline-and-credit" – or "offsetting" – instrument. The relevant authority, in a baseline-and-credit scheme issues emission reduction (or removal) units ("credits") for a specific activity – e.g. rewetting of a peatland – to the proponent of the relevant measure. The project proponent is permitted to sell these credits into an emissions trading scheme. The buyer of the credits in turn can use the credits in lieu of a permit or allowance to satisfy his or her surrender obligations.

The inclusion of sectors and activities through a "baseline-and-credit" mechanism has the advantage that participation is voluntary and (usually) happens in incremental steps that are fairly easy to manage. In the case of the EU farming sector: A baseline-and-credit model could start at zero (or a handful of projects) rather than with the Herculean management challenge to roll out the scheme among 10.8 million (or 340,000, in case you address only the larger farms) farmers.

Still, the EU legislator decided against the creation of an EU baseline-and-credit mechanism, and although it allowed the use of the Kyoto mechanisms – "Joint Implementation" or "JI", based on Article 6 of the Kyoto Protocol, as well as the "Clean Development Mechanism" or "CDM", based on Article 12 of the Kyoto Protocol – it explicitly excluded the land-use related sector: land use, land-use change and forestry ("LULUCF") in the terminology of the UNFCCC.

Other emissions trading schemes in the world followed the EU example. As a consequence, it fell entirely to voluntary carbon standards to develop intervention formats in the LULUCF sectors, in general, and the peatland sector, in particular.

A voluntary carbon standard is a baseline-and-credit scheme that is similar in design to JI and CDM yet has not been created by a regulator (a Government authority) but by non-state actors instead. Also, importantly, it comes without the regulatory effect of representing or replacing a permit or allowance to meet surrender obligations. The buyers of voluntary credits – mostly, but not only, corporations – 'use' the emission reductions sold to compensate (or "*offset*") for their own carbon footprints: from heating offices, running electronics, operating trucks and cars, flying, etc. They have no regulatory obligation to surrender permits/allowances for their

[8] The specific role of agricultural production for food security is often understood as a protection against sectoral climate change mitigation actions. See, for instance, the Council Conclusions (European Union) of 17 May 2016, which note that "coherence should be ensured between the EU food security and climate change objectives in the implementation of the Paris Agreement", at http://webcache.googleusercontent.com/search?q=cache:hu0QDso8ltMJ:www.consilium.europa.eu/en/meetings/agrifish/2016/05/st09000_en16_pdf/+&cd=2&hl=en&ct=clnk&gl=us&client=safari;

[9] Joosten, H., et al., Peatlands, Forests and the Climate Architecture: Setting Incentives through Markets and Enhanced Accounting (2016).

[10] Eurostat, Farm Structures (2017), at http://ec.europa.eu/eurostat/statistics-explained/index.php/Farm_structure_statistics; and http://ec.europa.eu/eurostat/statistics-explained/index.php/Small_and_large_farms_in_the_EU_-_statistics_from_the_farm_structure_survey.

emissions; rather, they compensate as part of their corporate and social responsibility portfolio or else to help mitigate the risks of climate change.

2.3 Voluntary Standards and Peatland Interventions

Of the handful of voluntary carbon standards that are globally available, the VCS (Verified Carbon Standard – now under Verra)[11] offers a dedicated wetlands standard with bespoke methodologies on, inter alia, avoided conversion of peat swamp forests (VM0004), rewetting of drained tropical peatlands (VM0027), and (since 2017) rewetting of drained temperate peatlands (VM0036).[12] Projects have been forthcoming, too. The *Katingan Peatland Restoration and Conservation Project* has been registered in Indonesia, promising more than 7 m tCO_2e[13]. In Belarus, a restoration initiative seeks currently validation by VCS under the newly adopted methodology VM0036.

Other global standards – notably the Gold Standard[14] and Plan Vivo[15] – have so far not introduced methodologies or project activities targeting specifically the conservation or restoration of peatlands. However, as the Gold Standard has turned to address mitigation options in the agricultural sector, peatlands may come soon into view. Among its latest methodology developments is one on agricultural supply chains. Should this methodology ultimately include agricultural production from organic soils, this would present Gold Standard's first focus on peatland interventions. Plan Vivo is generally open for proposals on new project categories and accepts existing methodologies from other standards. Works may be under way to combine several areas in and around an extensive peat swamp in West Kalimantan, Indonesia, in a carbon project developed under Plan Vivo.[16]

More peatland-specific standards exist within several national systems, notably in Germany, Switzerland and the UK. The German MoorFutures Standard[17] has its origin in initiatives among academics, practitioners and civil society in the North-East of the country, and it retains elements of private stewardship, even though it is formally hosted and administered by state agencies in three different German states, Mecklenburg West Pomerania, Brandenburg, and Schleswig-Holstein. Three projects have so far been initiated, all of them peat restoration projects (the largest covering some 70 hectares: "Königsmoor" in Schleswig-Holstein).

In Switzerland, the peatland standard "max.moor"[18] has been active since 2017. Designed by the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), it targets restoration activities for the country's raised bogs which are believed to emit some 19,000 tCO_2 each year.

In the UK, a peatland-oriented standard, the UK Peatland Carbon Code[19], several years in the making, has recently been completed. While a few pilot projects are under development, economies of scale (benefiting institutional infrastructure, market outreach and more) may be

[11] http://verra.org (last accessed on 4 September 2018).

[12] All references are accessible at http://verra.org/methodologies/ (last accessed on 4 September 2018).

[13] http://www.vcsprojectdatabase.org/#/project_details/1477 (last accessed on 4 September 2018).

[14] https://www.goldstandard.org/articles/gold-standard-global-goals (last accessed on 4 September 2018).

[15] http://www.planvivo.org (last accessed on 4 September 2018).

[16] Intarini, Y. et al (2014); see also a VCS-based project document for other sites in this area: http://www.ifc.org/wps/wcm/connect/8c719a0043100f7bb009fb5868db7602/01._Pematang_Gadung_PD_FFIrevised_v3.1._Final.pdf?MOD=AJPERES last accessed on 4 September 2018).

[17] https://www.moorfutures.de (last accessed on 4 September 2018).

[18] https://www.wsl.ch/de/newsseiten/2017/11/klimaschutz-durch-hochmoorschutz-maxmoor-machts-moeglich.html (last accessed on 4 September 2018).

[19] http://www.iucn-uk-peatlandprogramme.org/peatland-code (last accessed on 4 September 2018).

gained through the integration of the Peatland Carbon Code into the UK Woodland Code, a fully-grown voluntary carbon standard – so far limited to afforestation and reforestation – with a project pipeline of 250 projects across the UK as well as a well-established carbon marketing platform with 70 corporate buyers so far. The UK Forestry Commission adopted the standard in 2011, and while validation and verification are performed by independent third parties, the Forestry Commission remains involved through representation in the Code's executive board, which is responsible for the interpretation as well as revisions of the Code. Discussions to merge the standards are ongoing.

Similarly, the Australian Government is considering the creation of a dedicated window for wetlands intervention under the Carbon Farming Initiative[20]. The initiative has since 2011 given rise to some three-dozen agricultural (soil sequestration) projects. However, thus far, a methodology for reducing emissions from peatland conservation has not yet been approved.

In the Americas, the American Carbon Registry ("ACR")[21] has gained early experience with wetlands projects. The ACR – which maintains an offsetting link to the California emissions trading scheme ("AB 32") – provides for several wetlands methodologies, though each is linked to a certain geography (Oregon, California and Mississippi). In 2017, the ACR ran a public commenting cycle for a methodology on "Avoided Planned Land Use Conversion in Peat Swamp Forests".[22] The results have not yet been published.

2.4 Peatland Carbon Projects: A Blueprint for Future Engagement

It is yet unclear whether methodological approaches for peat carbon interventions will consolidate across standards in the future and to what extent such interventions will become standard practice across countries. If they prove successful as an intervention format in voluntary standards, they may constructively inform regulatory systems starting with the new mechanisms of the Paris Agreement (Article-6-Mechanisms) and the offsetting scheme under development by the International Civil Aviation Organization (ICAO).

This study attempts first to identify – from a comparative analysis of existing standards and practices – robust criteria for a consolidated peat carbon standard. These criteria are meant to ensure the environmental integrity of projects centered on peatland conservation and restoration and prove viable from a carbon market perspective, i.e. can be developed and marketed under conditions attractive to both carbon market sellers and carbon buyers. In a second step, the criteria will be mapped against recent regulatory developments in international negotiations – the Paris negotiations, on the one hand, and the aviation negotiations, on the other hand – to identify entry points for peat carbon projects in future regulated markets. The mapping assessment will include strategic and tactical considerations to show the shortest and least risky way for alignment of voluntary peatland standards and the regulatory systems in question.

[20] http://www.agriculture.gov.au/water/policy/carbon-farming-initiative (last accessed on 4 September 2018).

[21] https://americancarbonregistry.org last accessed on 4 September 2018).

[22] https://americancarbonregistry.org/carbon-accounting/standards-methodologies/avoided-land-use-conversion-of-peat-swamp-forests/avoided-planned-land-use-conversion-in-peat-swamp-forest-public-comment-version-aug-2017.pdf (last accessed on 4 September 2018).

3 Comparative Analysis

This chapter 2 provides a qualitative review and analysis of the different voluntary carbon standards described in chapter 1. The review has the form of a snapshot assessment. It covers, first, key aspects of environmental integrity, notably the principles of results-based finance, independent validation and verification, monitoring and measurement, additionality, permanence, leakage, double counting, as well as safeguards and co-benefits. It covers, second, transaction and market details, notably the availability of credits (supply), credit prices and investment options, transaction costs, and transparency.

3.1 Analytical Context

The voluntary standards open to or accessible in principle (if not yet in the form of a fully established project category) for peatland-related interventions share many characteristics. They all broadly follow what has become the classic carbon project cycle, consisting of:

1. Project design stage: Preparation of project documentation calculating the deviation of project from the baseline emissions, using a detailed methodological approach;
2. Validation stage: Independent review of the project documentation;
3. Project implementation stage;
4. Verification stage: Monitoring and independent review of the project results; and
5. Crediting and transaction stage: Issuance of credits into a registry, transfers, and credit retirement (offsetting).

There are notable differences among the standards, however, at each of the stages. This chapter 2 provides a comparative analysis of the different standards highlighted in chapter 1 along a variety of characteristics. The characteristics can be broadly separated in two categories: (1) environmental integrity, and (2) transactions and markets. With respect to environmental integrity, the characteristics used are the following:

- Results-based finance;
- Independent validation and verification;
- Monitoring and measurement;
- Additionality;
- Permanence;
- Leakage;
- Double counting (including double claiming); as well as
- Safeguards and co-benefits.

With respect to transactions and markets, the characteristics used are:

- Availability of credits (supply);
- Credit prices and investment options;

- Transaction costs; and
- Transparency.

An additional characteristic of cross-cutting nature concerns the availability of small- and micro-scale options in each standard. The following comparative analysis provides an overview to what extent the standards offer such options and how other criteria are affected. As the direct implications concern standard processes, the sub-chapter on small- and micro-scale intervention options is grouped together with the characteristics of environmental integrity.

The following standards will be included in the comparative analysis:

Table 1 Intonational and National Standards

International Standards	National Standards
CDM Afforestation/Reforestation (A/R)	UK Peatland Code / UK Woodland Code
Gold Standard (GS)	Carbon Farming Initiative (AUS)
VCS	MoorFutures
Plan Vivo	max.moor
American Carbon Registry (ACR)	./.

It is not the intention of the authors to compare the different standards. Each standard comes with a specific context and functions in unique environments, which are not comparable per se. This said, the study aims to assess to what extent each standard addresses the characteristics in terms of effectiveness and practicability. In each case, points are attributed from zero (non-effectiveness; non-practicability) to three (highly effective; highly practical). High effectiveness is conceded, where the underlying objective of the criterion in question is fully met. High practicability is conceded where the objective is also effortlessly reached, in the sense that simple, easy-to-use procedures are offered. By contrast, low effectiveness is found in situations in which the underlying objective is not adequately realized. Low practicability is found for situations, in which obstacles (direct obstacles or indirect obstacles) are deemed considerable and/or in which procedures suffer from redundancies. Medium-level points are given in situations, where the relevant criteria are met in principle, though reservations are in order or complications (e.g. for the ease of calculation or marketability) are to be expected

3.2 Environmental Integrity

The notion of environmental integrity has crystallized as the key threshold for any regulated form of international emissions trading,[23] and it is only fair for voluntary markets to demonstrate their own consistent compliance with it. The environmental integrity concept expresses itself in the capacity to prevent double counting.[24] It also includes the concepts and principles of results-based finance, independent validation and verification, monitoring and measurement, additionality, permanence, leakage, as well as safeguards and co-benefits.

[23] Cf. Articles 4.13, 6.1 and 6.2 of the Paris Agreement, as well as the Paris Decision, paras 92 (g) and 107.

[24] See Articles 6 Paris Agreement as well as Paris Decision, para 36.

3.2.1 Results-Based Finance

Results-based financing or "RBF" means the principle by which climate finance is distributed *on the condition* that pre-defined climate mitigation (or adaptation) achievements from a certain intervention have been achieved and verified.[25] This "*ex-post*" financing modality is widely applied across various climate policy instruments and lies at the core of emissions trading (carbon finance) as a whole: An emission reduction has to be achieved ("generated"), reported and verified, before it can be issued and transferred.

A surprising number of voluntary standards active in the AFOLU sectors diverge from the RBF principle by offering straight-forward "*ex-ante*" credits (MoorFutures, max.moor), offering either "*ex-ante*" or "*ex-post*" credits (Plan Vivo), or by going a middle way: Under its AFOLU window, the Gold Standard issues *forward credits* which it calls "Planned Emissions Reductions" ("PERs") and the UK Woodland Code "Pending Issuance Units" ("PIUs").

Forward credits have the advantage of adding a market layer and advancing carbon trades, thereby leveraging financing in a market with high pre-financing needs. However, they also add a level of complexity and may confuse market participants. The Gold Standard even applies its buffer rules to the PER issuance process,[26] no doubt in an attempt to exactly mirror the mechanics of final credit issuance. The PER may consequently be mistaken, though, for the sort of collateralized "results-based" credit that buyers will ultimately go for. Yet, those buffer PERs do not (yet) represent any real ("generated") emission reductions, and the functional role, thus, of PERs remains elusive. Clearly, they cannot offset emissions. Yet, it is this offsetting function, the compensation of *actual emissions* with *actual emission reductions* which is at the core of voluntary carbon markets.

For the MoorFutures standard (not max.moor, however), the fact that each intervention is underwritten by a dedicated land tenure title (a *servitude*), removes many of the concerns one would otherwise associate with *ex-ante* crediting. This mechanism may appear more robust than the forward-and-replace approach applied by the Gold Standard and the UK Woodland Code, which do not offer hard collateral for the ultimate success.

When designing a new, harmonized peatland standard approach, however, for use by governments, private sectors and public-private partnerships alike, it would seem the most transparent and environmentally safe option to apply *ex-post* crediting rules and solve the challenges of advance funding through other means (see below, chapter III).

Table 2 Criterion: Results-based-Finance

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM (A/R)	●●●	●	UK Peatland Woodland Code	●●	●●
Gold Standard (GS)	●●	●●	Carbon Farming Initiative (AUS)	●●●	●●●

[25] Warnecke, C. / Röser, F. / Hänsel, G. / Höhne, N., Connecting the dots. Results-based financing in climate policy (August 2015), at https://newclimate.org/wp-content/uploads/2015/08/newclimate-finalreport_rbfandcarbonmarkets14011.pdf (last accessed on March 6, 2018).

[26] Gold Standard, GHG Emissions Reduction & Sequestration Product Requirements, version 1 (2017), at https://globalgoals.goldstandard.org/500/501-er-gold-standard-for-the-global-goals-ghg-emissions-reductions-sequestration-product-specifications (last accessed on March 11, 2018).

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
VCS	●●●	●	MoorFutures	●	●
Plan Vivo	●	●	max.moor	●●	●●●
American Carbon Registry (ACR)	●●●	●	./.	./.	./.

Observations: CDM A/R, VCS, ACR achieve high-effectiveness on the principle of results-based finance, yet at the cost of practicability, in that they do not address the pre-financing gap that many peatland restoration projects face. GS and the UK Woodland Code offers different sets of credits, which helps with credit liquidity, yet at the cost of high complexity and perhaps confusion. Plan Vivo does not distinguish credit units "ex post" and "ex ante", which makes it little transparent. MoorFutures and max.moor offer only "ex-ante" credits, an approach hard to reconcile with the principle of results-based finance as such. Max.moor retires a CDM credit shadowing each issuance of a peatland credit, which adds to the criterion of environmental integrity, however. The Carbon Farming Initiative relies on "ex-post" crediting, while offering financing solutions through its combination of 10-year-offtake guarantees and professional project providers.

3.2.2 Independent Validation and Verification

All Standards examined follow a two-step "audit" approach: first the *validation* of project documentation, then the *verification* of implementation results. The need for robust, independent validation of emission reduction *plans* and verification of *emission reduction results*, in this context, is at the core of a standard's credibility and robustness. The CDM had established a centralized accreditation process for what it called the "designated operational entities" (or "DOEs") to be responsible for both the validation of the project design and the verification of results; and over just a few years, a dedicated DOE market of globally active, highly specialized firms had emerged. This brought a range of benefits in terms of professional service provision, project quality assurance, and global outreach, but it also came with a number of disadvantages, notably in terms of costs and practicability (including time practicability). Earlier worries[27] that the dual role of DOEs as arbitrators, on the one hand, and commercial operators (paid by the person they are examining), on the other hand, might weaken the robustness of the control, have mostly not played out.[28] In fact, the firm establishment of a few DOE suppliers seem to have solidified their independent role.

Most of the voluntary standards *grosso modo* follow the CDM approach, requiring independent firms to go through a specific accreditation process before they can be engaged as validators/verifiers. The VCS, PlanVivo and ACR automatically recognize any CDM accredited entity.[29] PlanVivo invites project applicants to suggest independent reviewers, which are then vetted by the PlanVivo. The standard specifically encourages the suggestion of individual experts (which, once approved, are retained as accredited by PlanVivo).[30] However, an approved project

[27] Wara, M.W. / Victor, D.G., A Realistic Policy on International Carbon Offsets. Working Paper. PESD (2008).

[28] Shishlov, I. / Bellassen, V., 10 Lessons from 10 Years of the CDM (2012), at http://www.cdcclimat.com/IMG/pdf/12-10-05_climate_report_37_-_10_lessons_from_10_years_of_cdm.pdf (last accessed on March 11, 2018).

[29] For Verra, see http://database.v-c-s.org/verification-validation/become-vvb (last accessed on March 11, 2018); for ACR, see ACR Validation and Verification Guidelines, version 1.1 (2012), accessible at https://americancarbonregistry.org/carbon-accounting/verification/verification (last accessed on March 11, 2018).

[30] PlanVivo, Project Validation Guidance (not dated), at http://www.planvivo.org/docs/Project-Validation-Guidance.pdf (last accessed on March 11, 2018.

document for a mangrove restoration project in Kenya[31] showed several inconsistencies and oversights, pointing to a relatively weak quality control within the standard. This is despite the fact that existing approved monitoring methodologies do not *per se* have apparent weaknesses. The Woodland Carbon Code requires validation and verification bodies to be accredited with the UK Accreditation Service.[32] The smaller standards usually do with fewer operators. In MoorFutures, the standard's scientific panel has accredited one entity for each participating jurisdiction, each in charge of both validation and verification.[33] Max.moor nominates an "independent entity" ("*externe Stelle*") for verification purposes (with simplifications for new projects implemented by a known (trusted) project proponent).[34]

Among voluntary standards, an important simplification to the CDM is offered: Project validation and verification can be performed by the same operator (under the CDM, this was only possible for small-scale interventions).

Accounting methodologies are pivotal in transparent and credible (science-based) carbon credit generation, and various standards have complex rules in place for the approval of methodologies. Such validation procedures, in particular in the wetlands sector, requires a team of specialists in general accounting, surveying and the science of wetlands (e.g. peatland hydrology). Yet, the few experiences to date illustrate that companies operating on the validation and verification market still have limited insight and expertise in the particularities of peatlands. The need for multiple validations (by separate entities) is welcome from the perspective of peer review and rigidity (the practice of PlanVivo seems somewhat lax, in comparison)[35]. However, it stretches existing capacity further. This is obviously an early stage phenomenon. The more peatland carbon work will be done, the more networks of knowledge – by developers as well as validators – will be established. At the moment, the lack of expertise represents a substantial bottleneck, however. Dedicated training will be needed to accelerate the validation of methodologies and the carbon project cycle at large.

At the same time, the independent review of both methodologies and projects would for the same reason be helped with simplified approaches including proxies that are relatively easy to assess but nevertheless with a strong correlation with GHG fluxes.

Table 3 Criterion: Independent Validation and Verification

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM (A/R)	●●●	●	UK Peatland Woodland Code	●●●	●●●

[31] http://www.planvivo.org/project-network/mikoko-pamoja-kenya/

[32] UK Woodland Carbon Code, version 2.0 (March 2018), accessible at https://www.forestry.gov.uk/pdf/WWC_V2.0_08March2018.pdf/$FILE/WWC_V2.0_08March2018.pdf (last accessed on March 11, 2018).

[33] For Mecklenburg and Western Pomerania: University of Greifwald; Brandenburg: Polytechnic School of Eberswald; Schleswig Holstein: University of Kiel.

[34] Gubler, L., Klimaschutz durch Hochmoorschutz. CO_2-Kompensation durch Hochmoorrenaturierung in der Schweiz (Juni 2017), accessible at https://www.wsl.ch/fileadmin/user_upload/WSL/Projekte/moor/Klimaschutz_durch_Hochmoorschutz_2017.pdf (last accessed on March 11, 2018).

[35] The approval of methodologies does not require external validation, cf. PlanVivo, Procedural Manual (May 2017), at http://www.planvivo.org/docs/Procedures-Manual.pdf (last accessed on March 11, 2018).

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
Gold Standard (GS)	●●●	●●	Carbon Farming Initiative (AUS)	●●●	●●
VCS	●●●	●●	MoorFutures	●●●	●●●
Plan Vivo (PV)	•	●●	max.moor	●●●	●●●
American Carbon Registry (ACR)	●●●	●●	./.	./.	./.

Observations: All of the standards come with robust levels of independent validation and verification. UK Woodland, MoorFutures and max.moor receive highest points on practicability given that they offer tailored and inexpensive solutions. PV offers a flexible accreditation solution; however, the validation results are not necessarily wholly robust.

3.2.3 Monitoring and Measurement

Each standard requires the project proponents (also called participants or coordinators, depending on the standard) to monitor the progress of implementation against parameters and indicators set out in the validated project documentation and the methodology used. Monitoring reports must be submitted as a pre-condition for verification. Some standards set submission requirements (e.g. MoorFutures, which requires the proponent to make the first submission 3-5 years into implementation and thereafter every 10 years). It may happen that certain project conditions change over time, and it is, then, a question whether such changes can be addressed in the form of an updated monitoring plan/report or if they require a full re-validation of the project. In the VCS and ACR, such changes must be part of the monitoring report and this will be assessed at verification. Also, every 10 years the baseline must be re-assessed. This is basically an overhaul of the PD. Plan Vivo allows flexibility, subject to a discretionary request for revalidation.

Table 4 Criterion: Monitoring and Measurement

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM (A/R)	●●●	●●	UK Peatland Woodland Code	●●●	●●●
Gold Standard (GS)	●●●	●●	Carbon Farming Initiative (AUS)	●●●	●●
VCS	●●●	●●●	MoorFutures	●●●	●●
Plan Vivo	●●●	●●●	max.moor	●●●	●●
American Carbon Registry (ACR)	●●●	●●●	./.	./.	./.

Observations: Monitoring requirements are similar across standards, with generally high effectiveness levels in terms of preparing the verification process. UK Woodland Code offers simplified procedures for small-scale projects.

3.2.4 Additionality

Another key carbon project component is the principle of additionality. It means that an offset project would not have occurred in the absence of carbon market incentives, i.e. that it was not the most likely or profitable option and that there were barriers for its implementation. The underlying ratio behind the additionality principle is twofold.[36] First, it is an expression of environmental integrity: If an intervention that would be realized in the ordinary course of action is accounted for as a mitigation effort, the latter's ambition is put in doubt, and any offsetting function really increases the overall emissions balance. Second, it addresses the need for efficient resource allocation. Carbon finance should be a means to an end. Allocating it to interventions that have no need creates an inefficient windfall for the recipient and leaves legitimate beneficiaries with less cash to distribute.

While the motivation is clear, the issue in practice is perhaps the most contentious in the offsetting world. A recent study claims that the additionality in about 85% of CDM projects across a range of sectors – though excluding the land-use sector – was in doubt.[37] The reason is, it is argued, that the relevant low-carbon technologies are widely available and a cost-efficient alternative.

For many land-use categories – in particular conservation and restoration – the situation is a priori different. Successful conservation/restoration technologies are often not widely practiced and economic considerations usually favor land degradation over protection/restoration. This notwithstanding, at least when it comes to forest conservation projects (REDD+), a number of interest groups is extremely vocal about their deep concerns concerning the principle of additionality. Interestingly, the difficulty to assess a hypothetical situation – would the project be implemented in the absence of carbon finance – is turned into an argument against forest carbon projects as a concept, rather than the notion of additionality: [38]

> *"The means by which these hypotheses are calculated and verified are so vague, and soriven with questionable assumptions and wishful thinking… that the carbon credits they offer to the market may well be meaningless in climate terms…"*

For project developers on the ground, conversely, additionality often presents a procedural hurdle, not a material one. The risk that windfalls are produced from nature conservation interventions is certainly low for peatland protection and restoration. In fact, assuming otherwise may do more harm than benefit, as farmers and forest owners may feel an incentive to intensify degradation to establish a ground for unquestioned additionality. In any case, it would seem in order to make a case for simplified additionality tests.

An interesting example is presented by the – now defunct – Chicago Climate Exchange (CCX) with its agricultural management projects (no or reduced tillage). The simplified additionality test consisted in participants demonstrating that the measures were "recently implemented",

[36] World Bank (2016), Carbon Credit and Additionality. Past, Present,and Future (PMR Technical Paper).

[37] Cames, M., et al., How additional is the Clean Development Mechanism? Analysis of the application of current tools and proposed alternatives (March 2016), at https://ec.europa.eu/clima/sites/clima/files/ets/docs/clean_dev_mechanism_en.pdf (last accessed on March 11, 2018).

[38] Kill, J., Why Aviation Industry Forest Offsets Are Doomed to Fail (FERN, November 2017), accessible at http://www.fern.org/sites/fern.org/files/fern_unearned%20credit.pdf (last accessed on March 11, 2018).

"beyond regulation" and came with a commitment to at least 5 years of no- or reduced-till practice. The CCX also awarded pro-active famers that adopted the practice ahead of joining the programme, and they were criticized for this. The standard argued, however, firstly, that pro-active farmers should be rewarded as well as re-active farmers, and secondly, that perverse incentives for stopping and then reactivating the activity would thus be avoided. This shows that pure climate integrity is not always the best foothold for resolving complex issues.

Given the still low number of registered projects compared with the considerable potential for conservation and restoration across the eligible project categories and standards, one can also argue that, apparently, still (a) significant barrier(s) exist(s) to implementation, a key criterion for additionality.

The VCS has pioneered so-called standardized methods to streamline the assessment of additionality in individual offset projects. For example, when it can be demonstrated that the activity penetration (i.e. the level at which activities have been executed) is small compared with the maximum adoption potential, the activities, as captured in a positive list, can be deemed additional upfront. This way, all such project activities do not need to demonstrate their additionality at the project level. Five percent is chosen as a sufficiently conservative threshold for activity penetration and follows a precedent established under the CDM.[39] The Gold Standard has recently introduced a similar methodology for establishing additionality.

In the VCS, the above standardized method has been applied to tidal wetlands conservation and restoration in a VCS REDD+ methodology (VM0007)[40] covering conservation and restoration of forests, peatlands and tidal wetlands (VM0007). Tidal wetlands conservation and restoration are captured in the positive list as part of the recent extension of the methodology to include this class of activities. But given the huge potential for peatland conservation and restoration activities, there is little in the way of adding these activities to the positive list as well. This requires an amendment to the methodology subject to double validation, which is an exigent process.

General requirements for an additionality test (e.g. under the VCS) are that an activity is not financially attractive, is not a regulatory requirement (or used to meet a regulatory requirement)[41], and/or is not common practice. In the above example of a standardized method, all three are satisfied. The exercise also shows that in the field of wetland conservation and restoration as a whole, additionality deserves to be regarded a less contentious topic.

Table 5 Criterion: Additionality

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM A/R (CDM)	●●	●●	UK Peatland Woodland Code	●●	●●
Gold Standard (GS)	●●●	●●●	Carbon Farming Initiative (CFI)	●●	●●

[39] VCS Standard v3.7, 2017, at http://database.verra.org/program-documents (last accessed on March 11, 2018).

[40] http://database.verra.org/methodologies/redd-methodology-framework-redd-mf-v15 (last accessed on March 11, 2018).

[41] E.g. Habit Banking, cf. Eftec, IEEP et.al (2010) The use of market-based instruments for biodiversity protection –The case of habitat banking – Technical Report. http://ec.europa.eu/environment/enveco/index.htm (last accessed on March 10, 201

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
VCS	●●●	●●	MoorFutures (MF)	●●	●●
Plan Vivo (PV)	●●	●●	max.moor (MM)	●●	●●
American Carbon Registry (ACR)	●●	●●	./.	./.	./.

Observations: All standards address additionality, though at different degrees. CDM, Plan Vivo, ACR, CFI, MF and MM provide no detailed assessment tools tailored to the project/ecosystem type in question. The VCS has introduced a convincing tool for tidal wetlands, but not yet for other project types; also, the tool may not work in all situations. The Gold Standard offers a comprehensive, clear and easy-to-use tool with different options capable to be used under differing scenarios (including an option for small-scale projects).

3.2.5 Permanence and Longevity

The concept of permanence was designed to respond to the temporary nature of CO2 removals in afforestation and reforestation ("A/R") projects, given that carbon sequestered in the biomass of trees is at a continuous risk of being re-emitted into the atmosphere.[42] In order to address this problem, the Kyoto Protocol framework established temporary credits, temporary Certified Emission Reductions (tCERs) and long-term Certified Emission Reductions (lCERs), which despite their name are also temporary credits. These credits require a one-off (lCER) or periodical (tCER) replacement or else will expire – a fact that, perhaps unsurprisingly, proved little enticing for investors.[43]

Voluntary carbon standards followed a different approach to the non-permanence challenge. Instead of issuing temporary credits, they collateralize and socialize the reversal risk, thereby ensuring that each credit issued is backed by a permanent reduction or removal action.

3.2.5.1 Collateralization

Voluntary standards oblige every project to transfer, from every credit issuance, a certain percentage into a collateral or "buffer" account. If a certain project that gave rise to a removal unit in the first place, after several years, is affected by a reversal event (a fire, say, or a logging event), then an equivalent number of units will be released and retired from the standard's buffer account. The units issued for that project, by contrast, remain unaffected and can be conceived as "permanent". All projects verified under the standard in question contribute to the buffer account, though the buffer share (or share range) is surprisingly variable from standard to standard (see table 6). It may be as little as 5% (Australia's Carbon Farming Initiative, though this buffer is specific in that comes on top of a replacement liability for project proponents in case of a reversal instance) and as high as 60%. The high number is rather theoretical, however. In practice, most standards apply a buffer from 10%-20%.

[42] See UNFCCC, Land Use, Land-Use Change, and Forestry (LULUCF), at http://unfccc.int/land_use_and_climate_change/lulucf/items/3064.php.

[43] Salinas et al., BioCarbon Fund experience: insights from afforestation and reforestation clean development mechanism projects (World Bank 2011), at http://documents.worldbank.org/curated/en/974011468326221734/BioCarbon-Fund-experience-insights-from-afforestation-and-reforestation-clean-development-mechanism-projects-summary, chapter 3.1.

Table 6 Buffer tresholds for land-use projects in the voluntary carbon standards under review.

Standard	VCS	Plan Vivo	ACR	Gold Standard	Carbon Farming Initiative
Buffer contribution	10-60%	10-30%	10-60%	20%	5%
Standard	MoorFutures	UK Peatland Code	Max.moor	CDM (A/R)	Climate Action Reserve
Buffer contribution	30%	15%	NA	NA	10%

Variations aside, the system has proved remarkably resilient. The authors know of no instance, where the buffer would have been broken, i.e. where the emissions from (a) reversal event(s) would have outmatched the buffer's credit pool. In fact, the numbers of the biggest land-use standard, the VCS, show conservative risk pooling. The standard has about 150 AFOLU projects in its books contributing to its buffer account. The total of deposited credits stands at about 24 million. None of the credits had to be cancelled yet; some 500,000 credits (some 2.5% of the total) have been put on hold, which means that a loss event has been reported and awaits verification.[44] While these numbers are comforting, the collateral may be less robust for standards with a smaller project pool. Regular "stress tests" of each of the standards' buffer would seem in order. The VCS is commended for its announcement to undergo such a test.[45]

As mentioned, most buffer withholdings are in the range of between 10% and 20%. A quantitative analysis of the largest project pool – the VCS project database – reveals that buffer withholdings across various AFOLU project categories are mostly 10% (40+ projects), and a dozen in the 10-15% and 15-20% ranges and only a few above 20% withholding. It is noted that avoided emission projects (REDD and CIW) have contributed by far the most to the buffer account. This might explain why the VCS is – despite the lack of scientific underpinning – eager to keep conservation projects within the buffer-withholding family.

3.2.5.2 Permanence of Avoided Emissions

The authors have long argued[46] that the risk of non-permanence does not apply to all land intervention types and that emission reduction measures – as opposed to removals – have no inherent reversal risk. Rather, they are similar to industrial emissions or the consumption of fossil fuels: Any slowing in their consumption will result in a permanent benefit for the climate, even if emissions jump back to previous levels (or worse).

The only relevant criticism would consist in the argument that the reasoning does not account for the risk of a complete stock loss. Slowing emissions from a peat stock which will nonetheless disappear within 30 years does add little benefit to the climate. And yet the same argument could be made against the reduced use of fossil fuels. No one would hold a combustion facility, which for a time burns less of, say, heavy oil and thus – for the time being – keeps more of it underground, *liable for reversal*, in case the stock, from where it usually receives its supply, is subject to a loss event. The very reversal argument is made against the agent, however, who

[44] VCS Project Database, at www.vcsprojectdatabase.org (last accessed on 3 March 2018).

[45] VCC, Request for Proposals, Stress Test of the VCS AFOLU Pooled Buffer Account (1 March 2017), at http://verra.org/wp-content/uploads/2017/02/RFP-STRESS-TEST-OF-THE-VCS-AFOLU-POOLED-BUFFER-ACCOUNT-1-MAR-2017.pdf.

[46] Joosten, H. et al., Peatlands, Forests and the Climate Architecture: Setting Incentives through Markets and Enhanced Accounting (UBA 2016), accessible at https://www.umweltbundesamt.de/en/publikationen/peatlands-forests-the-climate-architecture-setting (last acessed on 5 September 2018).

facilitates the slowing of peatland degradation. The distinction made here between on-site and off-site emissions seems – at least from an atmospheric perspective – arbitrary.

This said, so far none of the big standards follows the analysis of the authors. Strategy considerations around the option for peatland projects to be included in regulated systems may also argue for caution and incremental changes to current practice (see chapter 4). An obvious area of reform, however, concerns the risk calculation, which gives rise to the buffer in the first place. Stock loss events of considerable magnitude for peatlands are almost exclusively linked to fires. Problems with the hydrological system for maintaining high water levels are typically temporary in nature and the temporary lower water table will cause only a limited loss of soil carbon – nothing in the range of what may be lost due to fire. Fires become considerably less likely in instances of rewetting, compared to the baseline, which translates into a low buffer withholding for peatland rewetting and conservation programmes. If peatland rewetting and conservation were to be charged with a standardized buffer withholding, this should be a lower one than contemplated for forestry in general. A buffer withholding of no more 10% would seem appropriate to hedge projects against the particular risk profile (see further chapter 3).

The matter of permanence or non-permanence has repercussions at various levels, not just concerning the application of a buffer regime where arguably none is needed. It also shows at the level of minimum project longevity, which in turn comes with major legal, economic and psychological ramifications (see below.)

3.2.5.3 Permanence and Accounting

In a longer-term perspective, it should be noted that another way to address non-permanence would be through accounting, something particularly relevant in the context of the Paris Agreement and the trajectory of comprehensively capped economies. This is because once a cap for peatland (and/or other land-use related emissions) is established, the respective accounting system will directly account for any reversals. In an example: Country X accounts for both industrial and land-use emissions with an economy-wide target of minus 30% below 2010 levels by 2020 and minus 50% by 2030. As a result of multiple interventions in Country X's heavily drained peatlands (note that rewetting a peatland is a way of conserving carbon, i.e. of avoiding emissions; it does not necessarily sequester carbon), it ends up exceeding the 2020 target by 2%. Country X credits the surplus and transfers it to Country Y. In 2022, a catastrophic fire destroys half of Country X's peatlands leading to a major jump in annual emissions. The stock loss does not create a problem for the credits transferred to Country Y, as long as Country X keeps the debit in its books and accounts for the carbon soil loss as part of its 2030 target. Permanence, in this example, is guaranteed through accounting continuity.

It should be added, however, that accounting continuity implies comprehensive accounting and would be frustrated if Country X was allowed to waive the accounting debit by unjustified claiming the effects of "natural disturbances".[47] "Natural disturbances" are "beyond the control of, and not materially influenced by, a Party"[48], and will therefore normally not apply to drained and insufficiently rewetted peatlands.

3.2.5.4 Project Longevity

Permanence should not be used as a synonym for minimum requirements for project duration or project longevity. For example, the VCS limits the project crediting period to between 20 to

[47] "Natural disturbances" are defined as "non-anthropogenic events or non-anthropogenic circumstances", such as wildfires, insect infestations and extreme weather events, the emissions from which Parties may disregard in the context of Kyoto Protocol accounting (Articles 3.3 and 3.4), cf. Decision 2/CMP.1, para. 1 and para 33.

[48] Paragraph 1(a) of Annex to Decision 2/CMP.7 contained in document FCCC/KP/CMP/2011/10/Add.1, p.13.

100 years, but its non-permanence risk assessment rules require a minimum project longevity of 30 years (i.e. the number of years that project activities will be maintained, which may be longer than the project crediting period). Projects (or: farmers) unwilling to meet this requirement would fail the risk test and be ineligible for registering. Project longevity must be demonstrated, e.g. through a contractual arrangement to manage the project as "project owner" for a certain period of time. The minimum time limit under ACR is 40 years.[49] The Climate Action Reserve even requires evidence that the project continues for 100 years.[50]

Carbon project developers consistently point to longevity considerations as a key bottleneck for project developments. Farmers are rarely willing to commit their land as a whole or in parts for longer than 10, 20 or perhaps 25 years.

While obviously preferable to maintain project conditions for as long as possible, for most peatland interventions, short-term and mid-term project implementation periods have a clear climate benefit (see figure 2 above), and modules should be offered to farmers to commit to project periods of 10+ years, with obvious implications for the achievable carbon output and the buffer calculation (see chapter III).

Table 7 Criterion: Permanence and Longevity

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM (A/R)	●●		UK Peatland Woodland Code	●●	●●
Gold Standard (GS)	●●	●●	Carbon Farming Initiative (AUS)	●●	●●
VCS	●●	●	MoorFutures	●●	●●
Plan Vivo	●●	●●	max.moor	●●●	●●●
American Carbon Registry (ACR)	●●	●	**./.**	**./.**	**./.**

Observations: Only max.moor achieves full points in terms of effectiveness, as the standard correctly does not apply a buffer for peatland restoration projects. All other voluntary standards come with buffer arrangements which appear redundant to the authors. VCS' and ACR's buffer calculation is particularly complex without yielding an evident benefit. Project longevity rules, where they exist, do not adequately reflect the nature of emission reduction projects.

3.2.6 Leakage

An increase in emissions or a decrease in removals of greenhouse gases outside of the project area as a result of a carbon project's interventions are called leakage. Leakage in the LULUCF

[49] The American Carbon Registry Standard, Requirements and Specifications for the Quantification, Monitoring, Reporting, Verification, and Registration of Project-Based GHG Emissions Reductions and Removals (version 5.0, 2018), accessible at https://americancarbonregistry.org/carbon-accounting/standards-methodologies/american-carbon-registry-standard/acr-standard-v5-0-february-2018.pdf (last accessed on March 8, 2018).

[50] Climate Action Reserve, Forest Project Protocol, version 4.0 (2017), sec. 3.4, accessible at http://www.climateactionreserve.org/how/protocols/forest/dev/version-4-0/ (last accessed on 10 March 2018).

sector – in particular REDD+ – is traditionally broken down into a) activity-shifting leakage related to shifting an activity such as agriculture from the project site to some other location; or b) market-effect leakage, when a project reduces the local supply of a product increasing production elsewhere[51]. Specific to wetlands, an additional type of leakage is ecological leakage, i.e. an increase in emissions or decrease in removals in an ecosystem outside the project boundary that is hydrologically connected to the project area[52]. Some methodologies or modules require projects to avoid leakage by setting specific limitations to projects pertaining to the kind of pre-project land use permitted, and a careful establishment of project boundaries. This way, arduous tracking of leakage emissions by projects is omitted. Avoiding activity-shifting and market leakage can be achieved, if, for example, the following conditions are met[53]:

a) Demonstrate that prior to the start of the project the land is free of land use that could be displaced outside the project area

b) Require that a land use that could be displaced outside the project area (e.g. timber or reed harvesting) is not accounted for in the baseline scenario, or

c) Require a pre-project land use that will continue at a similar level of service or production during the project crediting period (e.g. reed or hay harvesting, collection of fuelwood, subsistence harvesting)

For example, project developers may demonstrate that farmers have abandoned the project area prior to project start or that the land has already become unproductive (e.g. due to subsidence).

VCS' REDD+ methodology VM0007, however, allows for quantifying leakage emissions in the with-project scenario, in a variety of approaches in leakage accounting modules developed for forest conservation projects as well as a module for ecological leakage originally developed for peatlands, where ecological connectivity is of similar importance as in tidal wetlands.

Ecological leakage in tidal wetland projects is avoided in both the restoration and conservation methodology by a project design which manages hydrological connectivity with adjacent areas so as to avoid a significant increase in net greenhouse gas emissions outside the project area, for example by establishing a project boundary wide enough to capture expected water level changes that are linked to project activities.

The above points to project design in which leakage accounting can be avoided through a careful definition of mitigation measures and avoidance criteria, thus leaving certain other situations for which the tracking of leakage remains a necessity. A portfolio-wide assessment of the VCS REDD+ database is instructive. When expressed as a percentage of net emission reductions, in the VCS project database a relatively low significance of leakage (≤10%) appears to have the highest frequency amongst all REDD categories (avoiding planned and unplanned deforestation).

However, in the underlying data there seem to be no real trends in the various REDD categories; they can all have low or high leakage emissions. Therefore, categorizing leakage based on types of projects and simplifying modalities by attaching conservative default leakage emission values to project types seems unfeasible. Moreover, if default leakage values would be set for certain

[51] Aukland, L., P. Moura Costa, and S. Brown. 2003. A conceptual framework and its application for addressing leakage: the case of avoided deforestation. *Climate Policy* 3: 123-136.

[52] Verified Carbon Standard. 2017. Agriculture, Forestry, and Other Land Use (AFOLU) Requirements. VCS Version 3 Requirements Document. Verra, Washington, D.C. http://database.verra.org/sites/vcs.benfredaconsulting.com/files/AFOLU_Requirements_v3.6.pdf

[53] E.g. http://database.verra.org/methodologies/methodology-tidal-wetland-and-seagrass-restoration-v10

project types, this might open opportunities to create leakage by poor project design or implementation, or both. In conclusion, a standardized approach to leakage seems not feasible.

Table 8 Criterion: Leakage

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM A/R (CDM)	••	••	UK Peatland Woodland Code	••	••
Gold Standard (GS)	••	••	Carbon Farming Initiative (CFI)	••	••
VCS	•••	••	MoorFutures (MF)	•••	••
Plan Vivo	•••	••	max.moor (MM)	•	•
American Carbon Registry (ACR)	•••	••	./.	./.	./.

Observations: Most standards account for leakage, though not necessarily for ecological leakage (VCS, PV, ACR, MF do). None of the standards offers tailored guidelines for peatland conservation and restoration projects (even though the matter is complex, see main text). Some standards apply a de minimis rule of 5% leakage impact (below which leakage does not need to be accounted for). MM does not account for leakage at all.

3.2.7 Double Counting

Double counting refers the risk that the same activity or effect to reduce or remove GHG emissions is accounted for twice (or multiple times), Double counting can occur in different forms. A common typology differentiates four types of double counting (see table 9). *Double selling* occurs where an issued unit is sold more than once to different actors. *Double issuance* means the scenario in which a unit is credited twice under two different standards or in two different registries or in which it is duplicated in the same registry. *Double claiming* occurs where two entities 'claim' the environmental benefit of the exact same reduction or removal unit. *Double monetization*, finally, refers to the situation in which the same GHG emission reduction effort is monetized multiple times, e.g. once by the government at an inter-governmental level and by a company in a private transaction.

Table 9 Risk of double counting

Double issuance	Double selling	Double claiming	Double monetizing
A unit is issued at least twice	The same unit is sold at least twice (other than in a chain of sales)	The same unit or underlying effort is claimed by at least two different entities	The same unit or underlying effort is transferred for value or to meet a liability

It is, however, not always as clear as it would seem to identify cases of unwanted double counting. The clearest example is double counting in the same accounting system. If Country A and Country B assume each a GHG reduction target under the Paris Agreement, for instance, and

if only Country A reduces its GHG emissions accordingly, only Country A may claim this reduction effort (and reach its target), not Country B at the same time. Both countries may agree that Country B instead of Country A can claim the reduction efforts (e.g. on the basis that Country B pays for the realization), but the basic rule is that it is either Country A or Country B, never both countries at the same time.

Another straight-forward example for double counting occurs when within the same accounting system allowances or (offset) credits are issued twice for the same activity or sold or else monetized twice. It is noted that double counting, in this scenario, does not require multiple issuance of credits. Double counting may also arise within a carbon-tax-based system (such as those planned in South Africa[54] and under implementation in Colombia[55]), where certain activities are deemed exempt from or where they reduce certain tax obligations.

The situation becomes less clear, however, in cases where instances of double claiming, double issuance, double selling or double monetization happen under different accounting systems and by different agents.

3.2.7.1 Synchronization

An obvious example, in which double counting is not an issue is the following. The European Union is party to the Kyoto Protocol and has assumed specific GHG emission reduction targets. At the same time, the EU designed an emissions trading system for EU-based energy-intensive industries (EU ETS). Industrial installations must reduce their GHG emissions or purchase offset credits in order to achieve their targets. The two systems have been fully synchronized (until 2012 at least). An allowance under the EU ETS is matched (or "shadowed") by a Kyoto unit; a Kyoto credit (a "CER" or a "ERU") is usable (directly or since 2012 indirectly) under the EU ETS. Thus, emission reductions were claimed at two different levels: the installation-level as well as the Kyoto-Party-level.

However, even though the same reduction efforts are claimed at different levels in this example – EU installations as well as at the national or supranational level – no case of double counting occurs. The synchronized architecture of the two emissions trading schemes made double counting between the systems impossible, and indeed, the EU introduced the emissions trading scheme at the lower level precisely to be able to achieve its Kyoto target.

Similar instances of synchronization apply for jurisdictional approaches. A municipality, state or region may assume a local or regional target and trace performance through robust GHG accounting. At the higher level, the country or region may have its own target in place. It will naturally account for the performance at the lower government level in its own accounting system.

More complicated are situations of sponsoring in public-private partnership, i.e. where voluntary carbon crediting is co-funded from state resources. max.moor, to take an example, is designed to ensure that at least 10% of investment needs are sourced through carbon finance.[56]

[54] Republic of South Africa, Draft Carbon Tax Bill (2017), section 13, accessible at http://www.treasury.gov.za/public%20comments/CarbonTaxBll2017/Draft%20Carbon%20Tax%20Bill%20December%202017.pdf (last accessed on March 8, 2018).

55 Article 221 of Law No 1819 of 2016 ("Reforma Tributaria Estructural") and Decree No 926 of 2017 on voluntary engagement, cf. http://www.minambiente.gov.co/index.php/decreto-926-de-2017 (last accessed on March 8, 2018).

[56] Gubler, L., Klimaschutz durch Hochmoorschutz, CO2-Kompensation durch Hochmoorrenaturierung in der Schweiz (30. Juni 2017), accessible at https://www.wsl.ch/fileadmin/user_upload/WSL/Projekte/moor/Klimaschutz_durch_Hochmoorschutz_2017.pdf (last accessed on March 8, 2018).

In other words, up to 90% of project costs are covered by the federal and the cantonal government.

In these cases, the fact that the government is directly and substantially involved in the realization of the project argues for treating the matter as a matter of synchronization. However, the use of a voluntary carbon standard may in fact indicate a non-synchronized instance of double-counting (see below).

3.2.7.2 Conflicts

When different accounting systems are not designed as complementary with each other, double counting, again, becomes an issue. If the same activity were to issue credits under two different, equally available carbon standards – e.g. the Gold Standard and the VCS – this, again, would be a straight-forward incidence of double counting. All voluntary standards under review – through the use of robust and comprehensive registries make sure that two forms of double counting – double issuance and double selling – do not happen or, where they happen, cannot be effectuated. Each unit issued by a standard receives a unique serial number and can be traced back to a particular project and particular project boundaries.

The other two forms of double claiming – double claiming and double monetization – present obstacles, however, and the standard practice is not identical. This is because they mostly involve different accounting levels: project-level accounting on the one hand (under a voluntary standard) and country-level accounting, on the other hand.Of the standards under review, the Gold Standard, Plan Vivo and ACR have strict double counting rules in place that, in principle would prohibit double claiming or monetization whether at the same accounting level or at different ones. These standards understand the mitigation action, as represented in a carbon unit, as unique, not serving simultaneously another emission reduction purpose, whether for the proponent or a third party, including a government. They have introduced strict obligations for project proponents to ensure that double counting is avoided. The Gold Standard, for instance, published relevant guidance in 2009:[57]

> „Gold Standard VER host country or state. Gold Standard VER project activities may be located in any host country or state. However, where host countries or states have caps on GHG emissions, projects shall only be eligible if the Project Proponent has provided the Gold Standard Foundation with satisfactory assurances that an equivalent amount of allowances will be retired to back-up the GS VERs issued. Any AAUs may be retired for this purpose. Gold Standard credits will not be issued prior to confirmation by the relevant local authorities that an equivalent amount of allowances has been retired. “

Not all standards apply this level of rigor. MoorFutures, max.moor and the Carbon Farming Initiative, in particular, are silent on the issue. The latter faces no issue in practice, however, since the Government purchases the credits and thereby concentrates all related claims as a single proponent. The UK Woodland Standard acknowledges and tolerates the double counting effect, it sees it mitigated, however, by the fact that units are not traded outside the United Kingdom.

Standards with strict double claiming and monetization bans are confined to a subsidiary role only. They can only source from projects, where the underlying emission reduction or removal effort does not assist an operator or a government with meeting compliance obligations or

[57] Gold Standard, Requirements, version 2.1 (2009), III.b.3. Die Regelung ist inzwischen teilweise überholt, s. zur neuen Regelung: Gold Standard, Double Counting Guideline, abrufbar über https://www.goldstandard.org/sites/default/files/documents/2015_12_double_counting_guideline_published_v1.pdf (zuletzt aufgerufen am 1. Mai 2018).

overall reduction targets. For countries (or jurisdictions) with a cap-and-trade or carbon tax in place, this would leave those economic sectors for voluntary project development, which are not directly or indirectly covered by the relevant scheme. In most, if not all domestic emissions trading schemes, land-use based sectors contributing to, or removing, soil carbon emissions, will fall in this category. They are not subject to a cap and hence, voluntary approaches will assume an exclusive project-based accounting benefit.

Where there is overlap, however, voluntary approaches can only be pursued either in lieu of (*replace*) or in excess of (*supplement*) the conflicting scheme, and the operation usually requires additional steps to ensure that double counting does not occur. Thus, credits issued for a certain project operating under the Clean Development Mechanism may convert to, and be replaced by, credits under a voluntary standard such as the VCS. For this to happen, the proponent must demonstrate, however, that all credits for conversion first are cancelled, before they are re-issued by the relevant voluntary standard.[58] A similar mechanism had been created under the EU ETS, when it absorbed previous Joint Implementation (JI) projects.[59]

The Paris Agreement has created a new playing field in that it obliges contracting parties to prepare and maintain successive "nationally determined contributions" or "NDCs" (Article 4.2) and in that it lays out a "progression" pathway towards a contracting party's "highest possible ambition" (Article 4.3). While there is no explicit obligation to set economy-wide targets, continuous dispensation for any particular sector would likely contradict a country's "highest possible ambition". Moreover, concerning the land-use sector, in particular, Parties are encouraged to ("should") take action to conserve and enhance sinks and GHG reservoirs (Article 5.1). Countries have or will, therefore, set targets ("contributions") across sectors. Japan, for instance, commits to 26% reduction compared to 2013 levels, accounting for all sectors including LULUCF and formulating sub-targets per sector (targeting 7.9 million tCO_2 sequestration from cropland and grazing land management, among others).[60] Uruguay – to give a developing country example – plans to halt (the country's NDC uses the more flexible term "avoid" or in Spanish: "*evitar*") emissions from 10% of the country's grassland areas (1 million hectares), 50% from the country's peatlands (4183 hectares) and from 75% of its cropland areas which have a soil use management plan in place (1147000 hectares). Additionally, it plans to sequester CO_2eq in the remaining 25% of the area (383000 hectares). Other countries are less explicit, but nonetheless have established an accounting framework. The European Union for one – though somewhat vague on the instruments how to address LULUCF[61] – sets a target in the form of an "[economy-] wide absolute reduction from base year emissions".[62] That means that the risk of double counting applies to it, too.

[58] Cf. the guidance of the VCS, at http://database.v-c-s.org/sites/vcs.benfredaconsulting.com/files/VCS%20Guidance%2C%20CER%20conversion%205%20Nov%202015.pdf (last accessed on February 23, 2018).

[59] Article 11b (3) and (4) of Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, amended on numerous occasions.

[60] NDC Japan, at http://www4.unfccc.int/submissions/INDC/Published%20Documents/Japan/1/20150717_Japan%27s%20INDC.pdf (last visited on February 23, 2018).

[61] Cf. First NDC, Eruopean Union, at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/European%20Union%20First/LV-03-06-EU%20INDC.pdf:

"Policy on how to include LULUCF into the 2030 GHG mitigation framework will be established as soon as technical conditions allow and in any case before 2020…"

[62] Ibidem.

3.2.7.3 Solutions: Corresponding Adjustments

It would seem that there is little room for voluntary action, in these examples, without running the risk of double counting. However, even here the risk of double counting can be managed and effectively mitigated. To do this, voluntary approaches would need to pursue *supplementary* action, in excess of any *unconditional* country targets, and they would need to be accounted for as such. To take the Uruguayan example: If the country commits to halt emissions from 50% of its peatlands by a particular date, then another 50% of peatlands remain accessible for additional voluntary action. In fact, Uruguay makes a case for this in the NDC by setting a *conditional* target on top of its unconditional one. With international support, the NDC reads, the targets for grassland emissions and peatland emissions are extended to 30% of the grassland area and 100% of the peatland area, respectively. International support, that is, may be government-to-government funding, funding from international finance institutions (IFIs) or, indeed privately sourced.[63]

To permit the identification of government (NDC) action, on the one hand, and additional (voluntary) action, on the other hand, host governments would need to use their accounting system and make "corresponding adjustments" – to use a term from the Paris Decision (the instrument adopted alongside the Paris Agreement) which deals with double counting in the context of Article 6.2 of the Paris Agreement – accordingly.[64] Any number of emission reductions accounted for under a project would need to be disregarded for the purposes of measuring the country's achievement of its own targets (or the NDC target needs to adjust, i.e. strengthened in a corresponding way). (If actual units are issued under the Paris Agreement, then the corresponding adjustment would consist in the cancelation of NDC-informed carbon units for any units issued for a voluntary project.) Importantly, no complementary credit adjustment will be made for any country, irrespective of whether the voluntary credits are traded domestically or internationally. The resulting climate benefit is a gain for the atmosphere (which is ultimately attributed to the purchaser of the credit).

It is important to note that making corresponding adjustments will only be required, when voluntary projects are implemented in sectors which are included in a NDC target. For many sectors in many countries – especially concerning land use, land-use change and forestry – this is presently not the case. Classic voluntary project development will be possible, until such inclusion occurs.

Over time, however, with NDCs becoming ever more comprehensive, the nature of voluntary project development will change from a wholly non-regulated discipline to a hybrid scheme, in which governments will regulate or engage in, if not the governance of the voluntary standard at large, certain segments of it, including concerning baseline-setting and accounting. It may also engage as credit recipient (through purchase or tax-like quotas). A pioneer sector, where this is already happening, is REDD+. Nations increasingly lay out regulatory frameworks for the public approval of voluntary projects, with a view of securing comprehensive accounting under a country-wide or jurisdictional REDD+ target. Indonesia, for instance, has set up regulations for multiple REDD+ project intervention types, and it has clarified that 51% of REDD+ credits generated by any project must not be traded internationally – presumably so as to avoid that a

[63] Decision 1/CP 21.

[64] ICROA / IEATA, Guidance Report: Pathways to increased voluntary action by non-state actors (2017), at http://www.ieta.org/resources/International_WG/Article6/Portal/ICROA_Pathways%20to%20increased%20voluntary%20action.pdf (last accessed on March 8, 2018), refer to this approach as the "NDC crediting model"; similarly, while not particularly addressing conflicts between voluntary standards and NDCs: Schneider, L. et al., Robust Accounting of International Transfers under Article 6 of the Paris Agreement.

"corresponding adjustment", in this amount, does not need to be made.[65] The example shows that project developers should be prepared that host governments may be inclined to 'authorize' voluntary projects (i.e. to commit to make corresponding adjustments) on the condition only that they receive credits only beyond a relevant sectoral or country target.

Specific guidance from within the Paris framework – ideally a decision by the delegated legislator, the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA), on non-State-actor crediting under the various mechanisms laid out in Article 6 of the Paris Agreement and on harmonized, if not centralized reporting and registry functions – would be welcome. However, such guidance is not a prerequisite for private engagement and individual countries moving ahead and committing to relevant accounting rules.[66] Again, the practice of REDD+ provides useful insights in this respect. Both the Forest Carbon Partnership Facility (FCPF) as well as the Green Climate Fund (GCF), while acknowledging the general risk of double counting in the context of their REDD+ support, outline specific individual country guarantees to ensure that the double counting risk is effectively mitigated.[67] Centralized tools to avert the double counting risks in REDD+ would doubtless be helpful, but for as long as they do not exist, countries can offer their individual solutions.

The leading voluntary carbon standards have mostly not yet attuned their rules to the new NDC world, but updates can be expected soon or, at the latest, after release of the Paris Rulebook by the delegated legislator of the Paris Agreement. The American Carbon Registry recently committed itself to linking voluntary crediting with NDCs and communicating all international crediting action to the UNFCCC.[68] Whether the UNFCCC will respond to such communications remains to be seen.

3.2.7.4 Alternative Approaches

Arguably a different path out of the double counting dilemma has recently been suggested by the Gold Standard (among other, mostly less prominent standards or programs):[69]

> *"Gold Standard proposes to adapt its rules to meet the requirements of the Paris climate regime and create a new certification product: 'Certified statement of emission reductions'. Statements of emission reductions would be issued by Gold Standard at the end of the*

[65] Ministry of Forestry Decree P20/Menhut-II/2012; for further references see The REDD Desk, at http://theredddesk.org/countries/indonesia/legal-frameworks (last accessed on March 9,. 2018).

[66] Discussing the issue prior to the adoption of the Paris Agreement, but from a similar perspective: Schneider, L. / Kollmuss, A. / Lazarus, M., Addressing the risk of double counting emission reductions under the UNFCCC (2014), at https://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-WP-2014-02-Double-counting-risks-UNFCCC.pdf (last accessed on February 26, 2018); arguing for immediate and flexible country action: ICROA/IETA, op cit.

[67] Cf. Forest Carbon Partnership Facility (FCPF), Methodological Framework (revised version: 2016), Criterion 23: "Double Counting", at https://www.forestcarbonpartnership.org/carbon-fund-methodological-framework (last accessed on February 26, 2018); Green Climate Fund (GCF), Request for proposals for the pilot programme for REDD-plus results-based payments (September 2017), para. 33: "… host countries will be expected to covenant that no other party has rights to the [REDD+] results other than the host country and provide information in the funding proposal about how such results will be treated or used…", at https://www.greenclimate.fund/documents/20182/820027/GCF_B.18_06_-_Request_for_proposals_for_the_pilot_programme_for_REDD-plus_results-based_payments.pdf/0691c547-110a-4bee-886b-084664326fe1 (last accessed on February 26, 2018); see also the related issue of "double payment" and "double financing" as discussed in GCF, Pilot Programme for REDD+ Results-based payments (June 2017), at https://www.greenclimate.fund/documents/20182/751020/GCF_B.17_13_-_Pilot_Programme_for_REDD__Results-based_Payments.pdf/8e3e9bf8-c02a-478b-b26f-f0743da2395e (last access on February 26, 2018).

[68] The American Carbon Registry Standard, Requirements and Specifications for the Quantification, Monitoring, Reporting, Verification, and Registration of Project-Based GHG Emissions Reductions and Removals (version 5.0, 2018), chapter 10, accessible at https://americancarbonregistry.org/carbon-accounting/standards-methodologies/american-carbon-registry-standard/acr-standard-v5-0-february-2018.pdf (last accessed on March 8, 2018).

[69] Gold Standard, A New Paradigm for Voluntary Climate Action: "Reduce Within, Finance Beyond' (May 2017), at https://www.goldstandard.org/sites/default/files/documents/a_new_paradigm_for_voluntary_climate_action.pdf (last accessed on February 26, 2018).

certification process, following the same process that currently leads to issuing carbon credits. These statements would be issued when the project is contributing to the host country's target – either when the project is in a sector included in the NDC or when the host country is not willing to enable the transfer of emission reductions outside its national inventory. Funders could claim to have funded emission reductions that contribute to the host country achieving its target rather than to have reduced their own footprints.

The VCS is considering a similar move issuing so called "domestic climate contributions".[70] Concerns remain, however, and investors have reason to be cautious. With or without issued credits, where the voluntary efforts ultimately show as a country effort, the actual climatic benefit is doubtful. The very objective of voluntary action – to achieve additional emission reductions – then, risks being undermined.

However, the envisaged statements may still be regarded as an important step towards transparency of action and comprehensive accounting. While proponents and investors of voluntary action wish to secure that their actions are additional to any governmental commitments (or lead to additional government commitment), they do not choose to do nothing for as long as the host governments does not commit to any form of "corresponding adjustment". Robust, independent and ideally harmonized reporting (using $tCO_2eq.$ as the guiding metric) by voluntary standards of voluntary efforts, in this situation, may be the best mitigation strategy available.

3.2.7.5 2050 Horizon

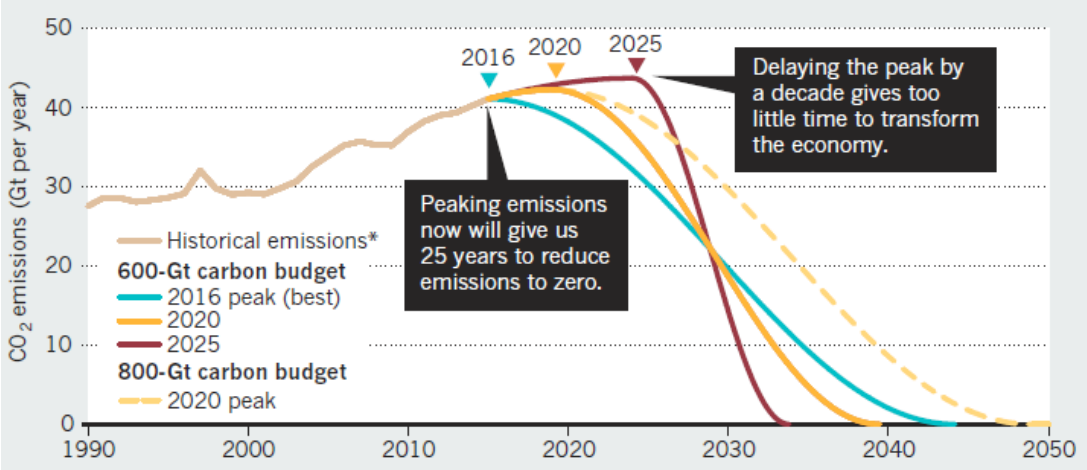
Voluntary carbon project efforts are meant to supplement compliance regimes and advance emission reduction pathways. This is a finite exercise, when the 2°C (or even the 1.5°C) ceiling is to be kept. The stricter these regimes will (have to) become *across countries*, the less room will there be for additional emission reductions (or offsets). Projections show that by about 2050, net-zero emissions must be achieved at the global level (s. figure 5). "Net-zero" means that gross emissions may continue, as long as they are backed by sequestration gains, but the perspectives and capacity of the latter are limited.[71] Space for emissions – and thus for excess emission reductions – becomes ever tighter, and with it the baseline calculation over time. In the Uruguayan example above: Once it becomes government policy to halt all emissions from peatlands (by 2050 ideally), supplementary voluntary action will be mute.

The important mission of voluntary standards between now and 2050 is to facilitate and advance the zero-net pathway, thereby helping its probability exponentially (see the different scenarios on timing in figure 5). Yet, its role remains transitional or else the 2°C or 1.5°C ceilings will remain fiction.

[70] Verra, VCS Version 4, Public Consultation 2018, proposed standard documents available at http://verra.org/project/vcs-program/rules-and-requirements/vcs-version-4-public-consultation/ (last accessed on 3 September 2018).

[71] UNEP (2017). The Emissions Gap Report 2017. United Nations Environment Programme (UNEP), Nairobi. https://wedocs.unep.org/bitstream/handle/20.500.11822/22070/EGR_2017.pdf

Figure 1 GHG emissions pathways 2050



GHG emissions pathways 2050 to secure the Paris Agreement 2oC goal.(Source: Figueres et al. 2017.[72]

3.2.7.6 Accounting for Peatland in Europe

The European Union is currently designing and implementing an accounting framework for the bloc's LULUCF sector. Decision 529/2013/EU[73] has set out rules to monitor and report various types of LULUCF emissions and removals including – as of 2021 – from cropland management (CM) and grazing land management (GM). While the accounting for emissions from wetland drainage and rewetting (WDR) is optional, the vast majority of peatland-related emissions will be covered as part of soil emissions accountable under CM, GM and forestry.[74]

Additional legislation has recently been adopted to include LULUCF into the 2030 Climate and Energy Framework.[75] At the center of the new regulation is the *'no-debit rule'*, which mandates EU member states to balance CO_2 removals and emissions within the LULUCF sector. Wetlands remain excluded from the scheme until at least 2026. However, this does not apply to peat soils that fall under forestry, cropland or grazing land. Emissions and removals from these soils are covered from 2021 and must be accounted for under the 'no-debit rule'. Excluded are, however, peatlands drained and used for peat extraction and peatlands used for settlement and other land incl. infrastructure, e.g. windmills. These land use types are in some countries currently the largest causes of new peatland drainage.

In many countries land use on peat is a very substantial source of emissions from the land sector. Generally, these soil emissions remain concealed in overall LULUCF reporting. Ongoing drained peatland

[72] Figueres, C. et al, Three years to safeguard our climate, Nature 546, 593-595 (29 June 2017), accessible at https://www.nature.com/news/three-years-to-safeguard-our-climate-1.22201#auth-5 (last accessed on March 9, 2018).

[73] Decision No 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities, OJ L 165/80 of 18 June 2013.

[74] Joosten, H. et al., Peatlands, Forests, and the Climate Architecture: Setting Incentives through Markets and Enhanced Accounting, Climate Change 14/2016, Umweltbundesamt, accessible at https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/climate_change_14_2016_peatlands_forests_and_the_climate_architecture.pdf (last accessed on March 8, 2018).

[75] Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry into the 2030 climate and energy framework and amending Regulation No 525/2013 and Decision No 529/2013/EU, Official Journal of the European Union, L 156/1 of 19 June 2018.

emissions may in several countries with decreasing forest sinks eventually frustrate compliance with a 'no debit rule' of no net emissions from LULUCF.[76]

While the no-debit target will initially be in easy reach for many EU member states – the EU-LULUCF sectors offset 7.1% of total emissions from other sectors in 2015 –[77] its existence presents a direct challenge to voluntary offset approaches. Ideally, the EU legislator will provide a tool for corresponding adjustments for any voluntary credits. Otherwise, double claiming (if not double monetization)[78] may be an issue, at least for countries which need to take extra efforts to reach the no-debit target (Denmark and Ireland, for instance)[79]. Member states may alternatively design their own policies to mitigate the risk (e.g. by committing to exceed the no-debit rule sufficiently to account for voluntary crediting or by cancelling other available units (e.g. under the EU ETS).

Table 10 Criterion: Double Counting

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM A/R (CDM)	●●●	●●●	UK Peatland Woodland Code	●	●●
Gold Standard (GS)	●●●	●●	Carbon Farming Initiative (CFI)	●●	●●●
VCS	●●●	●●	MoorFutures (MF)	●	●
Plan Vivo (PV)	●●	●	max.moor (MM)	●●	●●
American Carbon Registry (ACR)	●●	●	./.	./.	./.

Observations: Double counting presents a veritable challenge to all voluntary standards (under Kyoto, CDM issuance did not face any double counting risk). GS and VCS have started addressing the problem by offering mitigation statements or domestic contributions. However, the risk that state efforts are watered down persists. The mitigation approach by ACR appears patchy (only CORSIA and Article 6 Paris Agreement situations are addressed). The double counting rule of the UK Woodland Code also suffers from the risk that country efforts can be watered down. CFI has no double counting issue, since the Government purchases the credits. However, this is true in practice only. In theory, project proponents could also sell to other entities, in which case a double counting situation would occur. MF and MM have no double counting strategies in place yet.

[76] Wetlands International, Greifswald Mire Centre, Birdlife International 2017 Mandatory accounting for managed wetlands in the EC Proposal on LULUCF Regulation., accessible at https://www.birdlife.org/sites/default/files/attachments/mandatory_accounting_for_managed_wetlands.pdf

[77] European Environment Agency (EEA), Annual European Union greenhouse gas inventory 1990-2015 and inventory report 2017. Submission to the UNFCCC Secretariat (May 2017), page 652, accessible at https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=7&cad=rja&uact=8&ved=0ahUKEwjl7Z3ju93ZAhWmxFQKHbQFD9YQFghfMAY&url=https%3A%2F%2Fwww.eea.europa.eu%2Fpublications%2Feuropean-union-greenhouse-gas-inventory-2017%2Fdownload&usg=AOvVaw3APW8SCJaRl4htnjGhS3mH (last accessed on March 8, 2018).

[78] The LULUCF regulation will allow a limited transfer to allow for offsetting within the Effort Sharing framework, the cap-and-trade system covering all sectors outside the EU ETS and LULUCF.

[79] EEA, op.cit.

3.2.8 Safeguards and Co-Benefits

Each of the standards aims not only to achieve emission reductions (or sequestration gains) but to yield wider environmental benefits. However, the way such benefits are acknowledged and measured differs from standard to standard. *First*, almost all standards include safeguards requirements, based on the concept of "no harm", i.e. the project intervention must not threaten, cause damage to, or lead to an impingement of environmental or cultural goods or human and indigenous rights.

Safeguard requirements range from an obligation "to describe" the environmental and socio-economic impacts of a project (CDM A/R) or to make a detailed statement of compliance (UK Woodland Code), to generalized impact statements at methodology level (Carbon Farming Initiative), to a detailed social (livelihoods) assessment (Plan Vivo), and to in-depth mandatory safeguard standards (Gold Standard, American Carbon Registry). The VCS sets out certain specific safeguard requirements (in particular: native ecosystems must not be converted) and otherwise offers a detailed safeguard assessment under an optional add-on standard only, the Climate, Community and Biodiversity Standard (CCBS).

Second, some standards have started focusing on ecosystem services emanating from, or implied in, peatland conservation and restoration projects, notably concerning biodiversity, soil sustainability, water purity and flood control. Clearly identifying what is often referred to as "co-benefits" appears a valuable effort not least in light of new trends among carbon credit buyers to purchase more holistic environmental credits/benefits.[80] Voluntary standards are increasingly accessing "carbon-cum___" metrics.

The VCS has long partnered with the Climate, Community & Biodiversity (CCB) Standard, and Verra houses now both the VCS and CCB.[81] Land-use projects that register under the VCS can choose to go through a secondary screening by the CCB Standard, which examines a project for its specific social (community) and ecosystem (namely biodiversity) benefits. If successful, any credit issued by Verra/VCS receives a CCB label. The CCB Standard has been developed as a joint venture by a range of internationally active NGOs, and its label has historically been valued by voluntary offset buyers in the form of a substantial 'premium' mark-up. To what extent the premium mark-up still applies, has lately been put in question, however.[82] A recent partnership of Verra concerns the streamlining of carbon projects with implementing, quantifying and marketing women's empowerment results. For that purpose, Verra teams up with the Women Organizing for Change in Agriculture and Natural Resource Management standard ("WOCAN W+ Standard").[83]

The Gold Standard has recently transferred its various standards – those producing carbon credits as well as its water standard – into a single framework, the Gold Standard for the Global Goals ("GS4GG").[84] The new framework allows, as the Gold Standard did before, for the generation and issuance of Gold Standard Emission Reductions. Yet, in addition, projects can apply one or more of any approved quantification methodologies to issue and separately monetize what the Gold Standard refers to as the "Gold Standard Certified SDG Impacts" concerning, among other, water benefits, gender benefits, as well as impacts to reduce short-lived climate pollutants.

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[80] For new preferences to purchase credits with a wider environmental impact see Hamrick, K. / Goldstein, A., Raising Ambition: State of the Voluntary Carbon Markets 2016, at http://www.forest-trends.org/documents/files/doc_5242.pdf.

[81] Verra, Climate, Community and Biodiversity Standards, at http://verra.org/project/ccb-program/. (last accessed on March 9, 2018).

[82] Hamrick, K. / Gallant, M., Fertile Ground. State of Forest Carbon Finance 2017, accessible at http://www.forest-trends.org/documents/files/doc_5715.pdf# (last accessed on March 9, 2018). See figure 6, with a comparison between VCS + CCB and VCS (without CCB, which includes other sectors, too). VCS + CCB credits were trailing simple VCS credits in terms of price.

[83] Verra, Announcements 2017, at http://verra.org/media-alert-vcs-and-wocan-partner-to-link-co-benefits-of-womens-empowerment-with-carbon-projects/ (last accessed on March 11, 2018).

[84] Gold Standard for the Global Goals, Principles & Requirements, version 1.1 (1 March 2018), accessible at https://www.goldstandard.org/project-developers/standard-documents (last accessed on March 9, 2018).

The ACR is currently piloting different impact threads, in particular concerning forest carbon and public health as well as cookstoves and clean water.[85]

Among the domestic standards, MoorFutures is so far the only one to provide methodologies for quantifying results outside carbon proper, and it seems to be the first standard in the world to offer a peatland-tailored service list (including tailored methodologies). It covers improved water quality, flood mitigation, increased groundwater store, evaporative cooling, and increased mire-typical biodiversity.[86] The different ecosystem services ("ESS") can be quantified using a "standard" and a "premium" approach.

The Peat+ESS approach has been successfully tested in one demonstration project ("Kieve Polder"). However, the standard setters acknowledge that more work is needed (i) concerning instances of ecosystem conflicts (e.g. carbon benefits vs. biodiversity depending on the water levels restored) and (ii) the commodification techniques, i.e. how the ESS results are linked to, or even influence, the generation of carbon credits.

It may be a long way until a peat "super-credit" sees the light of day. Before then, however, measuring a number of peatland-related co-benefits is possible and offering standardization processes are highly recommended. Many impact investors will continue using carbon crediting as the core metric for measuring and verifying the (non-commercial) results of their investments. However, they are increasingly likely to see their corporate responsibility in a more holistic way including in terms of broader environmental ("climate+") benefits and social objectives. The global embrace of the Sustainable Development Goals also increasingly provides a firm standardized impact language. Given the pre-eminent significance of peatlands for natural resource management and livelihoods, peatland standards would do well using this language as soon as possible.

Table 11Criterion: Safeguards and Co-Benefits

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM (A/R)	•	•	UK Peatland Woodland Code	••	••
Gold Standard (GS)	•••	•••	Carbon Farming Initiative (AUS)	•	••
VCS	•	•••	MoorFutures	••	••
Plan Vivo	••	••	max.moor		

Observations: max.moor has no safeguards requirements in place. CDM A/R offers no specific safeguards and requires participants only to "describe" impacts. The UK Woodland Code requires statements of compliance but provides not much guidance. The Carbon Farming Initiative only checks safeguards at the methodological level (an approach that seems reasonable, however, for micro- and small-scale projects, however). Plan Vivo has a robust social component but lacks details for environmental checks. The Gold Standard includes a detailed safeguards protocol, linked to the SDGs. The American Carbon Registry gives proponents the opportunity to choose from different safeguards protocols (e.g. the World Bank's). MoorFutures does not include a specific safeguard protocol but offers a methodological approach to measure other ecosystem services than carbon.

[85] ACR, Case Studies, at https://americancarbonregistry.org (last accessed on March 11, 2018).

[86] Joosten, H. et al, MoorFutures, Integration of additional ecosystem services (including biodiversity) into carbon credits – standard, methodology and transferability to other regions, BfN Skripten 407 (2015).

3.3 Markets and Transactions

Voluntary carbon markets are marked by a considerable level of fragmentation. There are no centralized market platforms; prices are extremely variable; and specific project characteristics, notably project type, location and standard, are becoming increasingly relevant, which arguably undermines the assumptions that carbon trading was similar to commodity trading. What is traded on the voluntary markets is both credits *and* projects.

This said, basic market considerations continue to hold sway. Stagnant or even slightly decreasing credit demand – or demand for projects-cum-credits – is a stumbling block as well as credit prices that exceed the average price levels of about US$ 5-8. Peatland projects – at least those in industrialized countries – do, by a large margin.

On the other hand, carbon cycles and transactions often come with complex procedures and hefty transaction costs. This points to a market weakness, especially for small projects with emission reduction numbers of less than 50,000 credits a year.

Standard providers, while closely monitoring market developments, do not actively engage at the transaction level. After all, their primary concern is the solidity of a project in terms of climatic and other environmental benefits, not its commercial value. Other actors – including government actors (as the Australian example shows) – are in a better position, when it comes to tackling market bottlenecks and, in particular, creating demand. However, standards do have a role, where bottlenecks stem from high transaction costs, which in turn are the function of the complexities of the carbon project cycle.

3.3.1 Supply and Demand

Standards can guarantee high-value products, they can work on their brand and reputation, and they can explore emission reduction opportunities neglected by compliance markets or other climate policy tools. Ultimately, however, standards cannot create demand, and it is arguably the lack of predictable demand that is in the way for a rare niche market to assume scale.

The lack of healthy demand is hardly a concern for the few peatland projects planned or under development. Project numbers are so limited, and peatland projects are exotic enough that each of the projects – if developed under a robust standard – easily attracts a buyer. As the standards *MoorFutures* and *max.moor* illustrate, this holds true even for credit prices above EUR 50. The challenge arises, once there are no longer a handful of projects, but dozens or even hundreds. As the case of REDD+ shows, demand has not nearly kept up with supply over recent years; supply is deemed up to 10 times larger than demand.[87]

Demand may not remain static, of course. If compliance markets open a door to LULUCF credits or if new markets come into being (e.g. in international aviation, see chapter 4), offtake needs may increase dramatically. Voluntary standards have limited means, however, to influence such developments.

A specific demand-driven market incentive has been set by the Australian government. Through its Emission Reduction Fund (ERF), which has received funding in the amount of AUS$ 2.55 billion (EUR 1.67 billion), of which AUS$ 265 million remain unspent (or uncommitted),[88] it organizes regular reverse auctions for projects across sectors – the latest occurred in June 2018 – in which project developers can submit sales bids. Competitive bids (those below a previously

[87] Linacre, N. et al, REDD+ Supply and Demand 2015-2025 (USAID, 2015), at https://theredddesk.org/sites/default/files/resources/pdf/fcm_10_supply_and_demand_report_cleared.pdf (last accessed on March 7, 2018).

[88] http://reneweconomy.com.au/seventh-emissions-reduction-fund-auction-announced-39622/.

non-disclosed benchmark price) are ranked, and carbon sales contracts are awarded according to the rank and the price offered. The auction run in December 2017 led to the purchase of 7.95 m tonnes of Australian Carbon Credit Units (ACCUs) at an average price of AUS$ 13.08 (EUR 8.24).[89] The ERF auctions have over time produced a large portfolio of offset projects. They include more than 30 soil carbon projects, though no methodology has yet been designed for peat conservation or restoration interventions.

Table 12 Criterion: Supply and Demand

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM A/R (CDM)	•	••	UK Peatland Woodland Code	•••	•••
Gold Standard (GS)	••	••	Carbon Farming Initiative (CFI)	•••	•••
VCS	••	•	MoorFutures (MF)	••	••
Plan Vivo (PV)	••	••	max.moor (MM)		
American Carbon Registry (ACR)	••	••	./.	./.	./.

Observations: CDM saw few projects, but usually supply met demand. The GS project portfolio is relatively small, but again supply seems to meet demand overall. The VCS offers the highest number of projects and credits, but suffers from oversupply, in particular in the REDD+ market. PV and ACR supply credits that seem in healthy demand. The UK Woodland Code has created a large project portfolio of small projects and a thriving market. CFI offers Government-backed purchase guarantees at competitive prices. This situation has yielded by far the largest number of domestic soil carbon projects in the world (to generate some 18 million tCO_2e in total). For MM data is not yet available.

3.3.2 Credit Prices and Investment Options

In many countries, a key challenge for peatland projects will be the price. While peatland restoration may be competitive with other mitigation interventions in certain places where land and operative costs are relatively low, and the carbon density is high (e.g. Indonesia, which hosts VCS' Katingan Peatland Conservation and Restoration Project), for industrialized countries, the price per tonne of CO2 reduced from peatland interventions will be considerably higher than for other projects within the land-use sector and beyond.

MoorFutures has a price tag of US$ 40-80 per tonne. Max.moor charges around US$ 95 per tonne for peatland restoration in Switzerland. Ecological conditions for restoration vary sharply and so do prices of restoration,[90] yet average prices remain elevated. This has consequences. Peatland restoration projects could not easily be integrated in a cross-sector regulated offsetting market such as the European Emissions Trading Scheme (EU ETS). While in isolated (non-liquid)

[89] http://www.cleanenergyregulator.gov.au/About/Pages/News%20and%20updates/NewsItem.aspx?ListId=19b4efbb-6f5d-4637-94c4-121c1f96fcfe&ItemId=414 (last accessed on March 7, 2018.

[90] Artz, R. et al., Peatland restoration – a comparative analysis of the costs and merits of different restoration methods, James Hutton Institute (2018).

markets prices up to US$ 95 may find a buyer, harmonized (liquid) markets will pay the same commodified price for a carbon allowance or a carbon credit. The EU ETS permitted operators the meet their surrender obligations using CDM credits (though not from CDM A/R). CDM credit prices fluctuated (from between EUR 25 to EUR 10, before they went down rapidly to less than EUR 1 allowing), but the price was largely harmonized across production sectors. High-cost production conditions suffer from this drive to price harmonization, while low-cost production conditions flourish. In a future EU ETS context: Allowance and credit prices below EUR 35 per tonne would today seem prohibitive, where prices are around EUR 20. Obviously, this may change over time.

3.3.2.1 Australian Model: Emission Reduction Fund

This is why the model of the Australian Emission Reduction Fund (ERF) is of limited use. The ERF has been purchasing from projects across sectors through a reverse auction, i.e. by offering purchase prices to bidders. Since 2013, some 18 million tCO2e from agricultural projects alone have been purchased that way. The purchase price does not distinguish, however, among the sectors. It is the same for all projects participating in an auction. Over the years, it has fluctuated from between US$ 8-10. This price range is sufficient for the sort of carbon sequestration projects implemented in Australia so far. For peatland restoration interventions, it may be too low.

Dedicated funding tools, therefore, will be needed to prevent that peatland projects are left behind among a range of AFOLU categories in which abatement costs are much lower. A specific public fund (or fund/auction window) for the purchase of peatland credits is an option. This could be modelled on the Australian ERF but restricted to project types with similar abatement costs as those for peatland restoration projects. In Germany, the creation of a Peatland Climate Fund as a funding program (alongside the Forest Climate Fund) under the country's Energy and Climate Fund could be an alternative.[91] In that case, the use of reverse auctions may present a useful tool to steer price efficient action.

3.3.2.2 Swiss Model: Emission Reduction Fund

Another option is promoted by max.moor in Switzerland. The Swiss standard calculates that carbon finance may only cover 10% of the total project costs: the remainder is carried by the federal and the cantonal government. The purchase of a peatland credit, in this example, is cross-funded from state resources. This does not challenge the additionality function since state-funding is complementary only. However, it may affect the right to claim credits (see chapter 3.2.7.1).

3.3.2.3 Peatland Climate Protection Fund

A novel funding tool would consist in establishing a multiple purpose peatland climate protection fund. Such a fund could incorporate functions of the Australian Emission Reduction Fund, creating credit demand in a mid- to long-term perspective and keeping prices low through a reverse auction mechanism. The fund could, however, also address other needs, chiefly to provide collateral, seed or bridge funding in early project phases. It could also provide advice and support on the side of marketing and market-place creation, as well as concerning registration, long-term follow-up, and risk pooling.[92]

[91] For the Forest Climate Fund and its arrangement as part of the German Energy and Climate Fund, see https://www.waldklimafonds.de (last accessed on March 9, 2018).

[92] Wolters, S. et al., Entwicklung von Konzepten für einen nationalen Klimaschutzfonds zur Renaturierung von Mooren, UBA Climate Change 05/2013, at

In Germany, the creation of a Peatland Climate Fund as a funding program (alongside the Forest Climate Fund) under the country's Energy and Climate Fund could be an alternative.[93] It would be funded from EU ETS auction proceeds.[94]

3.3.2.4 Alternative Use Model: Paludicultures

A pathway to lower abatement costs and to provide broader access to land without removing soils from agricultural production cycles consists in amplifying and multiplying the intervention types. The growing experience with wetland cultivation ("*paludiculture*" from the Latin word "*palus*", in English "mire" or "swamp") presents the opportunity to adapt agricultural production on peat soils rather than to end it.[95] The cultivation of reeds (a renewable fuel and construction material), *sphagnum* (to replace peat as a growing media in horticulture) and black alder (a valuable timber source) all do best on the basis of wet peat soils.

Paludicultures are not yet cost-effective in their own right,[96] but they may lower the net costs of climate change mitigation by peatland rewetting substantially. Indonesia, for example, sees an important role for paludiculture in the implementation of its ambitious 2.4 million ha peatland rewetting goal.[97]

The change to paludiculture, however, is a paradigm shift compared to centuries of drainage-based peatland utilization. Whereas technical difficulties are rapidly being resolved[98], mainstream implementation still requires the removal of substantial legal and regulatory obstacles, financial incentives for all steps of implementation, and the provision of long-term planning security for land users. A large-scale shift to paludiculture calls for instruments that overcome current shortcomings.[99]

Peatland carbon projects can assume an important bridging role. Peatland rewetting is not economically viable on carbon prices below a comparably high threshold; and equally, it is not

https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/climate_change_05_2013_gather_renaturierung_von_mooren_barrierefrei.pdf (last accessed on 26 November 2018).

[93] For the Forest Climate Fund and its arrangement as part of the German Energy and Climate Fund, see https://www.waldklimafonds.de (last accessed on March 9, 2018).

[94] Cf. Umweltgutachten 2012: Verantwortung in einer begrenzten Welt, Kapitel 7: Moorböden als Kohlenstoffspeicher, at https://www.umweltrat.de/SharedDocs/Downloads/DE/01_Umweltgutachten/2012_Umweltgutachten_Kap_07.html (last accessed on 26 November 201).

[95] Wichtmann, W., Schröder, C. & Joosten, H. (eds.) (2016): Paludiculture - productive use of wet peatlands. Climate protection - biodiversity - regional economic benefits.

[96] E.g. Wichmann, S. 2016. Commercial viability of paludiculture: A comparison of harvesting reeds for biogas production, direct combustion, and thatching. Ecological Engineering dx.doi.org/10.1016/j.ecoleng.2016.03.018 ;

Wichmann, S., Prager, A. & Gaudig, G. 2017. Establishing Sphagnum cultures on bog grassland, cut-over bogs, and floating mats: procedures, costs and area potential in Germany. Mires & Peat 20, Art. 3. http://mires-and-peat.net/pages/volumes/map20/map2003.php

[97] Ministry of Environment and Forestry, Republic of Indonesia 2018. Managing Peatlands to Cope with Climate Change: Indonesia's Experience. Jakarta, March 2018 www.menlhk.go.id/downlot.php?file=Managing_Peatlands.pdf

[98] Wichtmann, W., Schröder, C. & Joosten, H. (eds.) (2016). Paludiculture – productive use of wet peatlands. Climate protection – biodiversity – regional economic benefits. Schweizerbart Science Publishers, Stuttgart, 272 p; Dommain, R., Dittrich, I., Giesen, W., Joosten, H., Rais, D. S., Silvius, M. & Wibisono, I. T. C. 2016. Ecosystem services, degradation and restoration of peat swamps in the South East Asian tropics. In: Bonn, A., Allott, T., Evans, M., Joosten, H. & Stoneman, R. (eds.): Peatland restoration and ecosystem services: Science, policy and practice. Cambridge University Press/ British Ecological Society, Cambridge, pp. 253-288; Joosten, H., Gaudig, G., Tanneberger, F., Wichmann, S. & Wichtmann, W. 2016. Paludiculture: sustainable productive use of wet and rewetted peatlands. In: Bonn, A., Allott, T., Evans, M., Joosten, H. & Stoneman, R. (eds.): Peatland restoration and ecosystem services: Science, policy and practice. Cambridge University Press/ British Ecological Society, Cambridge, pp. 339-357; Tata, H. L., & Susmianto, A. 2016. Prospek Paludikultur Ekosistem Gambut Indonesia. Bogor: FORDA Press, 96 p.

[99] Schröder, C., Wichtmann, W. & Joosten, H. 2016. The way out of the desert – What needs to be done. In: Wichtmann, W., Schröder, C. & Joosten, H. (eds.) (2016). Paludiculture – productive use of wet peatlands. Schweizerbart Science Publishers, Stuttgart, pp. 229-223; Wichmann 2018. Economic incentives for climate smart agriculture on peatlands in the EU. https://www.moorwissen.de/doc/paludikultur/projekte/cinderella/Wichmann_2018_Economic%20incentives%20for%20climate%20smart%20agriculture%20on%20peatlands_Report.pdf.

(yet) viable on the basis of paludiculture proceeds. Combining carbon offsetting with paludiculture can help lower the costs per tonne of CO_2 and make the paludiculture production more competitive.

Carbon standards offer dedicated methodologies. Rewetting interventions as such are covered by methodologies available in the VCS, MoorFutures and the UK Peatland Code, but none of these are fitted to the specific paludicultural use context. The VCS offers combinations of project categories, so that the biomass component in reeds, *sphagnum* and alder can also be accounted for, but not yet in the context of biomass replacing fossil fuel. Establishing a methodological paludiculture toolbox should be seen as a priority. There are few concerns in terms of environmental integrity. Additionality, in particular, does not present a challenge as long as paludicultures are not yet competitive (see on additionality above, section 2.2.4).

Table 13 Criterion: Credit Prices and Investment Options

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM A/R (CDM)	●●●	•	UK Peatland Woodland Code	●●	●●
Gold Standard (GS)	●●	●●	Carbon Farming Initiative (CFI)	●●	●●
VCS	●●●	●●	MoorFutures (MF)	●●	●●
Plan Vivo (PV)	●●	●●	max.moor (MM)	●●	●●
American Carbon Registry (ACR)	●●	●●	./.	./.	./.

Observations: CDM prices were low at cost (below US$ 4-5), but hard to trade for their temporary nature. Voluntary standards offer competitive prices, but not necessarily for projects involving peatland restoration. VCS' Katingan Project is the exception, though it is located in a low-cost, high-carbon-yield country (Indonesia). Among national standards focusing on peat, high credit prices are a reality. Price profiles could be improved through linking carbon project development to paludicultures.

3.3.3 Provisions for Micro- and Small-Scale Projects

Carbon projects involve considerable transaction costs. Carbon development costs for land-use projects – costs to collect and prepare data, prepare the project document, engage validators and verifiers, etc. – can easily reach EUR 120,000 (US$ 150,000) or more.[100] A single validation or verification that requires travel by a validator to a far-away site) can easily amount to a cost item of US$ 25,000. Local validators are often not available. Incurring such costs requires project developers to design and implement large area projects covering hundreds or thousands of hectares.

[100] Emmer, I., et al., Coastal Blue Carbon in Practice : A Manual (2015), at https://www.estuaries.org/images/rae_coastal_blue_carbon_methodology_web.pdf.

In densely populated and/or cultivated areas, it will often be challenging to find large available areas. Instead, one may find, here and there, pockets of land – e.g. pockets of degraded and restorable peatlands – that may be accessible for restoration activities, but for which a price tag of EUR 120,000 project development costs – *notabene*: this figure excludes the restoration costs proper – is non-viable.

The standards assessed approach this issue in different ways. Most standards allow the aggregation (or "grouping") of projects under a larger program: The program defines the key elements of intervention activities and carbon calculation for a large area, and once it is in place, projects located within this area can be validated using the documentation of the program. This reduces costs, per project, but a program needs to be found and triggered first, something which is often missing.

The Gold Standard offers a simplified carbon cycle for micro-projects, defined as projects with less than 500 hectares project area. Yet, relevant cost items – in particular costs for validation and verification – appear to remain high and the provisions do not specifically address the situation, in which the available area really is small. The UK Woodland Code, by contrast, has developed a special implementation window for smaller than 5 (sic) hectares. Such projects are notably exempt from field surveys for verification purposes and bundling further reduces validation costs.

Latest validation figures seem to confirm the appeal of the UK Woodland Carbon Code among small-scale project developers. 17 projects are currently under validation in Wales, covering no more than 92 hectares in total; in England, 55 projects are under validation, with a combined project area of no more than 621 hectares.[101]

The MoorFuture standard does not distinguish between large scale and small scale, but it manages to keep overall transaction costs low for all types of projects. It is regionally organized with a separate organizational set-up in each of the three German federal states that issue them. Next to issuing and registering bodies, academic institutions are involved. For validation and verification, a MoorFutures project in one federal state relies on an academic institution from another federal state. The focus on a single-project type, limited interventions (in type and space), and a clear description of requirements means validation and verification remain in the range of about EUR 1,000 (per validation or verification). Prices for validation and verification under the UK Woodland Code are similar. (Note that this cost item excludes costs for the preparation of the documentation and that it benefits from close (in-country) logistics for validators.

Table 14 Criterion: Micro- and Small-Scale Options

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
CDM A/R (CDM)	●●	●●	UK Peatland Woodland Code	●●●	●●●
Gold Standard (GS)	●●	●●	Carbon Farming Initiative (CFI)	●	●●

[101] Forestry Commission, Woodland Carbon Code Statistics (September 2017), at https://www.forestry.gov.uk/pdf/wccsep2017.pdf/$FILE/wccsep2017.pdf.

Intl. Standards	Effectiveness	Practicability	National Standards	Effectiveness	Practicability
VCS	●	●	MoorFutures (MF)	●●	●●
Plan Vivo (PV)	●	●	max.moor (MM)	●●	●●
American Carbon Registry (ACR)	●	●	./.	./.	./.

Observations: The CDM offered a range of small-scale methodologies, though few of them addressed the specific needs of micro-projects relevant for the peatland context. GS offers some simplifications, but few of them are substantial. VCS, PV and ACR do not offer more than the option to register aggregated (or "grouped") projects. The UK Woodland Code includes a number of simplification procedures for small and micro (up to 5 hectares) project. This reduces complexities and costs and attracts a wide range of small-scale farmers or small-sale sites. CFI does not offer particular small-scale solutions, but forms of aggregation are used widely. MF and MM do not have specific small-scale rules in place but offer overall slender rules to attract small-scale projects.

Summary of Findings

The comparative analysis of the different standards has shown overall strong performance rates on the different criteria, in particular concerning core issues such as independent validation, robustness of monitoring and verification results, additionality, leakage, and permanence. The standards under consideration have managed to provide methodologies and governance frameworks that are overall effective, robust, and transparent.

However, a closer look reveals differences among the standards, and the results are more mixed – not least in terms of practicability. Concerning the principle of results-based finance, i.e. of issuing credits upon realization of results only, there is no uniform approach among the standards, some of them restricting credit issuance to verification results, some of them issuing ex ante, some taking a dual approach. Among those that apply a strict ex post crediting approach, only one standard – Australia's Carbon Farming Initiative (CFI) – scores high on practicability, pointing to a structural challenge, namely how to reconcile the RBF ideal with an investment strategy that provides sufficient seed funding to help the projects off the ground. Australia's CFI offers 10-year contracts on future delivery making it viable for entrepreneurs to invest own funds into a wide range of soil carbon projects.

On validation and verification, most standards have chosen to divert from the CDM precedent allowing both evaluations to be provided by the same firm or organization. This flexibility makes it generally easier for projects to comply with these important procedural steps in the carbon cycle. Obstacles ("bottlenecks") remain, in particular for the larger standards which rely on the services of independent audit firms. As the area of LULUCF, in general, and peatlands management, in particular, require a very specific skill set, audit expertise is often not immediately available. Generally, validation and verification costs are high for the big standards. The small standards, by contrast, mostly manage to offer low-cost solutions to validation and verification needs. They can rely on a range of government or government-backed services such as (in the case of MoorFutures) the involvement of universities and other public sector entities to provide the relevant validation and verification audit.

On additionality, while all standards include the test in their methodological approach, the relevant test tools are not always well tailored to the specific situation of peatland conservation and restoration. The Gold Standard is the standard which offers the most comprehensive, clear and easy-to-use tool.

While the conceptual need for a permanence mechanism remains contested, all standards under discussion (the CDM aside) offer a buffer solution for all of their LULUCF projects (sequestration and emission reduction projects alike). On the assumption that permanence is an issue in peatland projects, the buffer approach has proved a robust way to deal with the problem. Buffer rules are sometimes too complex, however, and they appear overgenerous given the risk profile in question.

The risk of double counting is becoming increasingly complex against the backdrop of the Paris Agreement and the move among countries to establish – within their nationally determined contributions (NDs) –accounting targets covering the LULUCF sector. Not all of the standards under consideration have yet positioned themselves within the new Paris environment. The Gold Standard and the Verified Carbon Standard (VCS) have been the most outspoken so far, offering the flexibility to forego the issuance of credits in exchange for an emission reduction "statement" (Gold Standard) or "domestic contribution" (VCS). This brings the relevant standards closer to certifying private climate finance flows rather than tradable offset credits.

For peatland interventions worldwide, both safeguards ("do no harm") and co-benefits ("additional impact") are of particular relevance. The VCS offers co-certification by the Climate Community Biodiversity (CCB) standard. The Gold Standard includes a detailed safeguards protocol and offers impact quantification in line with the Sustainable Development Goals (SDGs). The American Carbon Registry has a mandatory safeguards section but allows flexibility to project proponents to choose any of the leading international safeguards protocols. The German MoorFutures standard has not established a specific safeguards protocol. On the side of co-benefits, however, it is piloting to quantify different ecosystem services tailored to peatland restoration.

The performance scores are overall patchier on market- and transaction-related elements. There is not yet much of a peatland carbon project market. Project numbers are small, and credit supply and demand remain untested. Observations in this area come with the caveat that carbon standards can only do so much to meaningfully impact or influence supply and demand.

This said, the healthiest balance of supply and demand can be seen in Australia's CFI. Again, the possibility to receive a 10-year price guarantee, funded by Australia's Emission Reduction Fund has created a wide portfolio of soil carbon projects (excluding peatlands, which play no significant role in Australia's habitat) and a good average delivery rate. The VCS, on the other hand, has certified a number of large-scale REDD+ projects, for which demand is uncertain.

A separate structural issue concerns the abatement costs of peatland restoration projects. They may not be high in many tropical countries. However, in industrial countries where land prices and engineering costs are high, there will be a significant price spread between peatland credits (US$ 95 a piece under Switzerland's max.moor-Standard) and other credit types. Standards have not yet addressed this particular issue. The promotion of paludicultures may bring the price spread down to create price compatibility with other sectors. As mentioned, however, standards may offer tailored methodologies, but they do not set the economic stimulus per se.

Where carbon standards do have a direct influence is the level of transaction and carbon cycle costs. In particular, standards can offer project formats for small-scale and micro-level activities with simplified rules and leaner transaction costs. Perhaps surprisingly, the big standards have been slow to provide simplified small- and micro-level activity formats. They do allow for programmatic approaches (grouping), i.e. the replication of project activities within a program over time. Yet, stand-alone small-scale interventions, or programs of small-scale activities only are not systematically addressed through simplified procedures. The small domestic project standards are different in this respect. The UK Woodland Code, in particular, with the help of the

UK Forestry Commission and its services, manages to offer certification procedures at a 3- or low 4-digit price tag.

4 Recommendations

This chapter 4 sets out recommendations for the development of peatland carbon projects aimed to ensure both the environmental integrity as well as the marketability of the respective interventions.

4.1 Approach

The recommendations are based on the current practice among standards as portrayed in chapter 3 above. The overall purpose is not to replace the existing peatland carbon standards with something radically different, but rather to formulate model elements integrating the existing practice, while at the same time offering new guidance to improve levels of efficiency and practicability in terms of environmental integrity and marketability.

Many of the recommendations collected here will impact all project sizes, though a number of recommendations are specifically made for micro- and small-sized projects. The authors will also make suggestions concerning institutional assistance to establish groups (or programs) of micro- and small-scale activities, and ways in which regulators can help.

The recommendations are meant to serve both voluntary standard developers as well as for regulators interested in promoting voluntary project performance. They broadly follow the structure used in chapter 3. For the ease of use, they are presented in fiche-format, i.e. for each criteria under discussion, a one- or two-page document was created in a uniform table format.

4.2 Overall Focus: A Model Peatland Code

It is not realistic – nor desirable – to replace the variety of distinct voluntary carbon standards with a single, unified model standard. Each existing standard has its own context, governance framework, and market acceptance. When we speak, in the below, of a Model Peatland Carbon Code, we mean each time any specific voluntary standard that incorporates the model provisions or details in question.

Broadly, the recommendations for a Model Peatland Carbon Code can be separated into the following categories:

- Facilitating Funding:
  - A key challenge consists in the upfront investment needs of many peatland restoration projects. We recommend that standards offer a credit delivery guarantee to collateralize advance funding from carbon buyers.
  - Another structural issue in many (though not all) countries consists in the high abatement and, thus, credit costs. We recommend that standards address this issue through offering short- and mid-term (10 to 15 years) intervention formats that will not necessitate taking the intervention indefinitely out of agricultural use, and through introducing tailored methodologies for paludiculture use that combine peatland protection with agricultural use. Furthermore, standards are advised to adjust their buffer requirements and either remove them for peatland emission reduction activities or set the buffer very low (at 10%) to reflect the specific (low) stock loss risk. We also recommend that Governments address the issue by establishing a dedicated fund to guarantee demand and provide market support to projects.

- Facilitating a Leaner Carbon Cycle Process:
  - The carbon project cycle – from developing project documentation to validation, monitoring, verification and credit issuance – is complex and challenging for every single project. Bottlenecks can be removed, however, and obstacles softened. A good way to start – in the view of the authors – is to make the validator requirements and the validator accreditation process more flexible.
  - Similarly, while of absolute importance that monitoring requirements are robust and transparent, they should be applied in a dynamic, flexible way. Also, the use of a variety of proxies to measure GHG fluxes should be encouraged to increase practicability and lower costs.
  - The additionality assessment is sometimes needlessly difficult and complex. The authors recommend that standards follow the approach of the Gold Standard and provide a flexible number of simple, easy-to-use additionality tools.
- Simplified Procedures for Small- and Micro-Projects:
  - The authors recommend that the standards put much closer focus on developing practical options for small-scale and micro-scale project development both in the project stand-alone and in the programmatic scenario (with many small-scale interventions in bundled form). A variety of calculations, tool applications and assumptions can be simplified in small-scale and micro-scale interventions. Monitoring options through proxies (e.g. water tables), in particular, should be provided for such interventions. Additionality and leakage tests could be standardized across jurisdictions.
  - Standards are advised to encourage further the use of programs through incentivizing the creation of coordinating entities. Trusted coordinated entities could engage with validators from peer to peer; they could assist land users with project cycle as well as implementation activities; and they could better organize the process of credit issuance, sale, and proceeds distribution.
- Adjust Double Counting Rules to the Paris Agreement:
  - The authors recommend that each standard adopt a transparent double counting policy tailored to the Paris Agreement and other national or regional accounting schemes.
  - Concrete options range from provisional and transitional project implementation (as long as emissions from peatlands are not included in a country nationally determined contribution (NDC) to project implementation strictly conditioned on a country's corresponding adjustment of its NDC against the credit number issued or other response mechanisms.

4.3 Specific Recommendations

4.3.1 Results-Based Finance (RBF)

Relevance:

"Ex-post" financing modality is based on the principle that climate finance occurs once climate change mitigation has been verified.

Table 15 Results-Based Finance

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
Widely applied across various climate policy instruments For details see chapter 3.2.1 However, several land-use standards allow some form of "*ex-ante*" credits anticipating future emission reductions, e.g. the Gold Standard and the UK Woodland Code	Forward credits have the advantage of adding a market layer and advancing carbon trades, thereby leveraging financing in a market with high pre-financing needs. However, they also add a level of complexity and may confuse market participants. For projects with long implementation phases (often covering decades), the projection made about future deliveries is particularly risky. At the end, there is the risk of watering down what has become a carbon market fundamental, i.e. that finance is provided on the basis of results, not expectations.	Apply a strict *ex-post* crediting rule (with no advance credits being issued, whether under the same name or a different one) Offer projects hedging instruments for advance payments. Option 1 would consist in using the existing buffer structures as insurance pool for advance payments made (capped at about 30% of the expected total amount). Option 2 would consist in creating a peatland carbon fund (cf. chapter 3.3.2.3) that invests in a wide portfolio of peat carbon projects, provides delivery guarantees for projects that receive advance payments (at a fee payable in share of proceeds from future issuances) and helps establish a market platform.

Recommendation for Small and Micro Scale	No further simplification or exception
Action Required	**Existing and future voluntary standards:** Gold Standard, Plan Vivo, MoorFutures, UK Woodland Code, max.moor to reconsider their use of ex-ante credits. **Authorities / Regulators:** Consider the establishment of (or support to) a Peatland Carbon Fund to function, among others, as guarantor for advance payments in peatland carbon projects.

4.3.2 Independent Validation and Verification

Relevance:

The need for robust, independent validation and verification of emission reduction results, in this context, is at the core of a standard's credibility and robustness.

Table 16 Independent Validation and Verification

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
VCS and other standards provide rules for external project validation and verification. Under the VCS: Double approval of accounting methodologies. Extensive instructions for validators and verifiers. For details see section 3.2.2.	A substantial driver of transaction costs, not least because validations and verifications are little standardized, and at the same time, methodologies do not necessarily fit the specific context. Audit firms often lack fully qualified teams of specialists integrating general accounting, surveying and the science of wetlands (e.g. peatland hydrology). Generally: risks of considerable delays, as accredited validators are often not available ("bottleneck" phenomenon).	Dedicated training of validators and verifiers in the wetlands sector. One auditor should be allowed to perform both validation and verification; and for methodology approval, single validation procedures should be sufficient. List of validators should be actively maintained. Secure closer involvement of experienced standard staff to help communicate between projects and validators (ex. Plan Vivo). Introduce a platform for ongoing peer-review of methodological procedures. Increase the use of methodological modules that allow project developers to tailor the methodology to their projects and validators to assess the project in a structured and transparent way (e.g. VCS/ACR VM0007). Open existing methodologies for legitimate project-specific adjustments (beyond the current limited possibilities within 'methodology deviations') to be reviewed at project validation.

Recommendation for Small and Micro Scale	Promote the aggregation of small- and micro-scale project activities in groups (or programmes) through simplified procedures (see below), with highly-skilled group (or programme) managers designing the methodological approach; these managers should be able to communicate with validators as peers
Action Required	Existing and future voluntary standards: Plan Vivo, UK Woodland Code and MoorFutures already apply the 1-validator/auditor approach; Plan Vivo is also highly accommodating in accrediting validators. Increase the use of methodological modules. Simplified sampling methods for small- and micro-projects exist in the UK Woodland Code, nut not yet in any targeted peatland code. Authorities / Regulators: Consider supporting trainings for validators/verifiers. Consider supporting the establishment of program entities (e.g. in Germany: at the regional (Länder) level either directly or through creating demand by procuring or (reverse) auctioning peat emission reductions. The Australian Carbon Farming Initiative is an example for how the establishment of specialised carbon program developers was triggered by regular auctions.

4.3.3 Monitoring and Measurement

Monitoring and solid measurement are at the core of robust and reliable carbon asset generation. However,

Table 17 Monitoring and Measurement

Relevance:

Assessing GHG fluxes in both the baseline and project scenarios is at the core of carbon asset generation

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
Standards allow the use of proxies to asses GHG fluxes, since their direct. measurement is unfeasible at the project scale. For more details on monitoring and measuring, see section 2.2.3.	In wetlands, GHG accounting involves hydrological processes that may vary greatly depending on the landscape context. Both baseline accounting and project monitoring may therefore become an onerous burden.	Further development of simplified approaches including proxies that are relatively easy to assess but nevertheless with a strong correlation with GHG fluxes. Offer off-the-shelf methodological modules for project developers to develop their own bespoke *in-situ* methodology to be reviewed at project validation. (Plan Vivo

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
		allows project-specific methodologies). However, the recommendation is meant to create consolidated modules for use to guarantee methodological robustness.
Recommendation for Small and Micro Scale		Strengthen the role of program entities, including through offering discretion concerning monitoring standards and oversight, it being understood that each instance of discretion granted needs to be (self-) reported and clearly described in scope and impact. Simplify rules for micro projects (stand-alone projects as well as grouped/bundled projects) and permit sampling methods and easy-to-establish evidence tools (e.g. footage, simple water-table measurements, and more). Allow, in particular, simplified approaches to greenhouse gas (GHG) measurements by encouraging the use of highly accessible proxies, as long as these show a strong and robust correlation with GHG fluxes. The setting of project baselines on current default figures established by the Intergovernmental Panel on Climate Change (IPCC).
Action Required		**Existing and future voluntary standards:** Review existing methodologies for the potential of simplification. Explore in-situ compilation of procedures in a next version of the standard.

4.3.4 Additionality

Relevance:

The principle of additionality ensures that mitigation action taken is sufficiently ambitious, that offsetting does not increase the overall emissions balance, and that climate finance is spent efficiently.

Table 18 Additionality

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
Most standards apply project-specific additionality tests (inspired by the CDM	Classic additionality tests mostly do not fit the project type of	Follow VCS' approach under VM0007 for the determination of additionality (positive

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
Additionality Tool using a baseline and additionality test assessing existing barriers to the implementation of the project activity). VCS has standardized the test in its REDD+ methodology VM0007: If the activity penetration level is below a certain threshold, additionality is assumed. GS offers a wider range of tests, including on penetration levels. For more details see section 2.2.4.	peatland conservation, let alone restoration. Risk of financial non-additionality is small. By contrast, regulatory additionality deserves particular attention, when project sites are located within protection regimes.	additionality, then, is assumed) or use the variable approach of the Gold Standard (which also allows for penetration threshold tests, but is open to other tests, too). Concentrate on the case of regulatory (non-) additionality. If there is an enforced legal obligation for conservation or restoration or if there are separate incentive schemes in place (e.g. biodiversity banking), additionality has to be individually justified.

Recommendation for Small and Micro Scale	No further simplification or exception
Action Required	**Existing and future voluntary standards:** Tailor the additionality to the specific peatland conservation and restoration scenario: Apply a combination of a positive list (*a-priori* assumption of additionality, if met) with a corrective assessment for regulatory non-additionality

4.3.5 Permanence and Longevity

Relevance:

The principle of permanence ensures that interventions have a long-term benefit for the atmosphere ("risk of reversal").

Table 19 Permanence and Longevity

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
All voluntary standards (except max.moor) guarantee permanence through a buffer arrangement: A share of issued emission reductions from each project will be set aside and pooled together to be released in case of a reversal incident. Project longevity is used as an additional tool to implement permanence. It indicates minimum time thresholds for	The practice among voluntary standards fails to distinguish emission reduction projects (for which a risk of reversal does not exist) and sequestration projects (for which it does). Project longevity thresholds are used arbitrarily. The additional value of longevity is unclear, given that every risk of reversal is insured against by the buffer rules.	Address the specific nature and risk profile of peatland projects as emission reduction projects by either limiting the buffer requirements to sequestration / removal activities or, at the very least, by adjusting the buffer requirement to the specific risk profile of peat stock loss events (as opposed to reversal risks in other project categories).

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
project implementation that projects need to meet (ensure the keeping in place of the project scenario). For details see section 2.2.5.		Simplify the non-permanence risk calculation and apply a common buffer withholding. The common buffer for sequestration activities may be conservatively set at 20% for stock enhancement activities. If peatland rewetting and conservation were to be charged with a buffer, consider a relatively low withholding of 10%. Remove the longevity requirement (redundant in its purpose) and allow shorter project periods (10 and/or 15 years), especially for agricultural peatland rewetting projects. The carbon atmospheric benefit of short-term (10 or 15 years) rewetting is of a lasting nature, even if drainage continues afterwards. Short-term windows will be interesting for farmers, in particular, who do not wish to commit to long-term land-use changes. Another way to address non-permanence would be through nation-wide accounting systems that directly account for any reversals.

Recommendation for Small and Micro Scale	*No further simplification or exception*
Action Required	**Existing voluntary standards:** All standards: Remodel the buffer requirements to the exempt emission reduction projects or to adjust the buffer amount to the stock loss event. All standards: Permit project windows of 10 and/or 15 years for peatland rewetting projects. **Authorities / Regulators:** Strive for nation-wide accounting systems that directly account for any reversals.

4.3.6 Leakage

Relevance:

An increase in emissions or a decrease in removals of greenhouse gases outside of the project area as a result of a carbon project's interventions. Due to the fact that these pertain to off-site effects of intervention, leakage is often seen as one of the main weaknesses of carbon projects.

Table 20 Leakage

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
Traditionally broken down into a) activity-shifting leakage related to shifting an activity such as agriculture from the project site to some other location; or b) market-effect leakage, when a project reduces the local supply of a product increasing production elsewhere. Specific to wetlands, an additional type of leakage is ecological leakage, i.e. an increase in emissions or decrease in removals in an ecosystem outside the project boundary that is hydrologically connected to the project area. For details see section 2.2.6	In the wetlands context, leakage may be a considerable burden to projects. Some methodologies or modules require projects to avoid leakage by setting specific limitations to projects pertaining to the kind of pre-project land use permitted, and a careful establishment of project boundaries. This way, arduous tracking of leakage emissions by projects is omitted.	Leakage can a priori be avoided through a number of mitigation actions. These should be clearly described and sanctioned at the level of the standard, removing complexity at the methodology level, and guiding project developers as well as validators. For details, see section 2.2.6 Reconsider, on the other hand, international leakage, i.e. the instance in which displacement moves, or threatens to move, beyond national borders. This simplification, practiced by all standards so far, has little value in terms of climatic benefits and the Paris Pathway.

Recommendation for Small and Micro Scale	*No further simplification or exception*
Action Required	**Existing voluntary standards:** All standards: Require projects to account for international leakage.e All standards: Describe circumstances under which leakage does not need to be considered.

4.3.7 Double Counting

Relevance:

Double counting refers the risk that the same activity or effect to reduce or remove GHG emissions is accounted for twice (or multiple times), which may cause the de facto weakening of mitigation ambition and an increase in real emissions.

Table 21 Double Counting

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
Most (but not all) voluntary standards address the issue directly. The risks of double issuance and double selling are effectively mitigated through robust data and registry systems.	The wider the NDC scope, the more likely it is that peatland related activities and emission/emission reduction results will fall into the NDC scope.	Define, in a transparent way, for each country and sector to what extent (and for which project activities) a double counting risk exists (peatland emissions may not be covered in a country NDC) and introduce periodical double

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
Double claiming presents the biggest challenges, notably in the Paris environment having introduced country "targets" (nationally determined contributions, "NDCs") across the globe. Various standards require mitigation action, e.g. through the cancelation of credits. Gold Standard and VCS have started introducing (or are about to introduce) non-tradable mitigation statements. For details see section 2.2.7.	Conversely, however, for most countries peatland related activities are not yet covered. Mitigation statements avoid double counting of emissions but may not address the underlying issue that country ambitions are watered down.	counting updates (linked to the 5-year NDC cycles); There is no double counting conflict and, consequently, peatland projects should be allowed, in countries or jurisdictions in which the activity is not reflected in an emissions trading scheme or the country's NDC. It is suggested to limit this right, however, in time (until 2025 or, at the latest, 2030; LDCs and SIDS may be granted longer timeframes) in order not to set the wrong incentives (for countries not to bring the activity into the NDC) (with crediting limitations until 2035). In countries in which the activities fall within the scope of an emissions trading scheme or an NDC, actions to address the double counting risk are required, namely: Option 1: Country guarantees a corresponding adjustment ("benefit for the atmosphere"). Option 2: Issuance of mitigation statements (or domestic contributions); however: this should be linked to a country's mitigation commitments, namely in developing countries to the conditional segment of NDCs (for process: UNFCCC country focal points should be notified). Option 3: Use a default mechanism in the form of separate credit cancelation policies (e.g. from Pre-2020 CDM credits). For CORSIA: Only Option 1 should be available (see chapter 4). Option 3 should be used in instances, too, in which projects are still crediting despite an NDC commitment (pre-2025 or pre-2030 projects).

Recommendation for Small and Micro Scale	***No further simplification or exception***
Action Required	**Existing voluntary standards:** All standards: Adjust in accordance with recommendations. **Authorities / Regulators:** Advocate towards a decision by the delegated legislator of the Paris Agreement – the CMA – concerning corresponding adjustments for voluntary market projects.

4.3.8 Safeguards and Co-Benefits

Relevance:

Projects must ensure not to produce unwanted negative impacts (no-harm rule). Given the wide set of ecosystem services offered by healthy peatlands, a form of measurement of additional benefits outside emission reductions may be feasible.

Table 22 Safeguards and Co-Benefits

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
Not all standards include a safeguards protocol. Some do, but in a fragmented way (Plan Vivo focusing on social aspects; VCS focusing on protecting native ecosystems). Gold Standard includes a detailed safeguards protocol. ACR allows the use of third-party tools (pending recognition), e.g. the safeguards tool of the World Bank. The assessment of additional benefits has been piloted by MoorFutures. For details see section 2.2.8.	The risk exposure naturally is different among regions and countries. While in countries with high primary forest coverage the situation of indigenous peoples may be of major concern, in many industrial country settings, ecological and cultural safeguards for historic landscapes play an important role. Co-benefits are often hard to measure, and direct link to the metric system of tonnes of carbon may not always be possible.	Each standard must include a mandatory safeguards protocol. The standard should spell out the various principles inspired both by the SDGs as well as REDD+ safeguards (the latter especially for standards active in REDD+ countries). Gold Standard provides a good point of departure, but hydrological and ecological aspects need to be strengthened. In that regard, the standard should address specific principles for interventions in degraded peatlands, such as the prohibition of rewetting through overflow. At the project level, proponents shall be invited to highlight the relevant safeguards issues; The SDG context allows to build an impact framework, which combines mandatory no-harm rules with positive measurements, in particular on fresh water supply, flood prevention, erosion prevention, sustainable food production, fiber and fuel. The positive measurements could be translated into a standardized reporting format that accompanies any credits issued.
Recommendation for Small and Micro Scale	***No further simplification or exception*** **For programs (grouped projects), full safeguards protocol to be implemented at program level only (with highlighted issues to be checked at project level)**	
Action Required	**Existing voluntary standards:**	

Recommendation for Small and Micro Scale	***No further simplification or exception*** **For programs (grouped projects), full safeguards protocol to be implemented at program level only (with highlighted issues to be checked at project level)**
	All standards: Adjust in accordance with recommendations. **Authorities / Regulators:** Develop national safeguards protocols and guidance on impact frameworks for interventions in peatlands. Follow up, in this respect, on the RAMSAR Resolution on the rapid assessment of wetland ecosystem services 102.

4.3.9 Supply and Demand

Relevance:

Today, few credits are sourced from peatland rewetting. Other than price-related obstacles (see below), the general demand for credits is hard to predict.

Table 23 Supply and Demand

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
VCS includes a large-scale peatland restoration project in Indonesia. There are few small- and micro-scale projects in the land-use sector in general (MoorFutures and max.moor are exemptions). Australia runs a project stimulating demand for agricultural projects, so far however not for peatland conservation or restoration projects.	The low output is partly due to a lack of standards: Only the VCS, the UK Peatland Code (still untested), MoorFutures and max.moor offer fitting project formats. Then, solid demand seems essential to attract investors to test little used project interventions and carbon methodologies. Small-scale formats should be encouraged, especially in countries with high area constraints.	Offer a bespoke peatland restoration standard. Governments can help create demand: UK and Australia are good examples; the former by designing and operating the UK Woodland Code as a simple and inexpensive standard; the latter by investing through a Government-fed fund and running regular reverse auctions (keeping prices low and shifting the full implementation risks to project proponents). Countries should follow the example.

Recommendation for Small and Micro Scale	***No further simplification or exception***
Action Required	**Existing voluntary standards:** All standards: Offer a bespoke peatland restoration (and conservation) standard and methodologies. **Authorities / Regulators:**

[102] Accessible at https://www.ramsar.org/document/sc54-211-draft-resolution-on-the-rapid-assessment-of-wetland-ecosystem-services (last accessed on 7 September 2018).

Recommendation for Small and Micro Scale	*No further simplification or exception*
	Consider creating a peatland restoration code similar to the way the UK has created its woodland code. Take a clear position on double counting (in line with section 3.7 above). Consider setting up a national or regional peatland carbon fund and run reverse auctions with 10- or 15-year offtake guarantees.

4.3.10 Credit Prices and Investment Options

Relevance:

In many countries, abatement prices per tonne of CO2 are very high making it impossible for projects to compete with low-cost alternatives from other sectors or other countries.

Table 24 Credit Prices and Investment Options

Current Practice	Issue	Recommendation for the Design of a Future Harmonized Peatland Standard
Standards usually stay clear of marketing efforts and carbon pricing arrangements. There are exceptions, e.g. Gold Standard and MoorFuture which both market credits. Also, max.moor is a public-private partnership that bases project implementation on public co-funding with a share of up to 90%. This notwithstanding, carbon prices from peatland restoration in Western Europe are between US$ 40 and 90 per tonne of CO2.	With prices that high, demand will be limited, at least large-scale demand of the type of CORSIA (see chapter 4).	There is little in the design of the standards that directly affects prices other than the size of the buffer (see above section 4.5. However, combining peatland restoration with paludicultures offers considerable opportunities, and standards can help indirectly by offering bespoke methodologies. The establishment of a methodological paludiculture toolbox should be seen as a priority. Standards should be open to co-funding from public sources (setting a maximum threshold in the way max.moor has defined one.

Recommendation for Small and Micro Scale	***No further simplification or exception***
Action Required	**Existing voluntary standards:** All standards: Adjust in accordance with recommendations. **Authorities / Regulators:** Design subsidy policies that target peatland restoration with co-funding options (to be met through a peatland carbon code).

5 Moving into Complience Markets

The following chapter provides an assessment to what extent peatland carbon projects may be integrated in the carbon offsetting and reduction scheme under development within the sector of international aviation as well as in the trading environment of the Paris Agreement after 2020. The report traces current negotiations and explores options and conditions under which an integration appears feasible, following the assessment categories on environmental integrity, safeguards and co-benefits, as well as markets and transactions.

5.1 Regulatory Context

While there is growing demand for credits in the voluntary markets,[103] overall annual offtake figures (measured in annual retirements) remain at a relatively low level (about 43 million retired credits in 2017), and supply (measured in credits issued) outpaces demand by about 50%. To increase the size of the carbon market, ultimately a closer link with compliance systems or hybrid markets will be needed.

The most concrete opportunity is presented in the offset mechanism *Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)*, Itself a hybrid market, i.e. a market which combines a regulatory (binding) framework with voluntary aspects of participation. Annual demand is expected to be in the hundreds of millions, likely setting incentives for ever more projects and accessing market segments that have so far been closed or mostly closed to carbon project development. This could mean for peatland carbon projects that securing their eligibility for CORSIA could become a game changer.

Beyond CORSIA, any of the two dozen or so national or subnational emissions trading schemes[104] may eventually open its regulatory regime for peatland carbon projects. Any such move is not imminent, however. No trading scheme to date involving operators (as opposed to governments) addresses peatland or – more broadly speaking – soil carbon activities directly (imposing an emissions cap on participants) or indirectly (allowing for soil carbon offsets).[105]

The likely route for peatland projects to enter domestic carbon trading schemes will be through the *flexible mechanisms of the Paris Agreement*. Just as the Kyoto Protocol with its emission reduction instruments – the Clean Development Mechanism (CDM) and Joint Implementation (JI) – became the blueprint for today's domestic trading schemes each resembling more or less the European Union Emissions Trading Scheme (EU ETS), so will the design of trading tools within the Paris Agreement inspire tomorrow's national and subnational trading schemes.

5.2 Offsetting in the Aviation Sector: CORSIA

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is under development as a delegated act of the International Civil Aviation Organization (ICAO), a specialized UN body, established – in 1944 through the Chicago Convention – to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention). CORSIA was adopted by ICAO's 39th assembly in October 2016 (Assembly

[103] Hamrick, K. / Gallant, M., Voluntary Carbon Markets. Outlooks and Trends. January to March 2018, at https://www.forest-trends.org/wp-content/uploads/2018/08/Q12018VoluntaryCarbon.pdf (last accessed on 21 August 2018).

[104] For an overview: ICAP. (2018). Emissions Trading Worldwide: Status Report 2018. Berlin: ICAP, available at https://icapcarbonaction.com/en/?option=com_attach&task=download&id=547 (last accessed on 6 June 2018).

[105] Von Unger, M. / Emmer, I., Carbon Market Incentives to Conserve, Restore and Enhance Soil Carbon (TNC 2018), at https://www.nature.org/content/dam/tnc/nature/en/documents/Carbon-Market-Incentives-Report.pdf (last accessed on 1 December 2018).

Resolution A39-3 or "A39-3" in the following)[106], after years of difficult negotiations among ICAO member states, the aviation industry and other stakeholders. CORSIA is part of a broader basket of mitigation measures to achieve the ICAO global aspirational goal of carbon neutral growth from 2020.

CORSIA does not address the whole package of greenhouse gases emitted by airplanes, but only CO2. Also, it does not aim to neutralize civil aviation's overall carbon footprint. Rather, CORSIA only addresses the annual *increase* in total CO_2 emissions above 2020 levels. Furthermore, CORSIA does not address aviation in all its constellations; it only aims at *international* civil aviation (i.e. civil aviation flights that depart in one country and arrive in a different country). This notwithstanding, demand is likely to be substantial, i.e. in the range of 142-174 Million tCO2eq. annually by 2025, to reach 580-816 Million tCO2eq. annually by 2040 (DEHSt 2017).

CORSIA follows a phased implementation approach, with a pilot phase from 2021 through 2023; a first phase from 2024 through 2026; and a second phase from 2027 through 2035. For the first two phases from 2021 to 2026, participation of States for offsetting requirements is voluntary. To date, 73 states – representing about 76 per cent of international aviation traffic – had announced their intention to participate in the CORSIA from 2021.[107] The EU, the US, Japan and Australia are among the volunteers as are many developing countries. China, however, recently withdrew its participation. From the second phase, virtually all countries except least developed countries (LDCs), small island states (SIDS) and landlocked developing countries (LLDCs) must participate in CORSIA.

Offsetting requirements for individual operators (airlines) will be calculated using a sector-wide standardized baseline in phase 2 (an operator's annual emissions multiplied with a single sectoral growth factor) and a combination of standardized and individual baseline from phase 3.

5.2.1 Regulatory Context

What CORSIA will recognize as offsets ("emission units") will largely depend on what the ICAO Council decides in the next years. The Council is ICAO's key governance body next to the Assembly, and it assumes a quasi-legislative role as the body responsible for adopting international standards and recommended Practices ("SARPs") and for incorporating these as Annexes to the Chicago Convention. The offset requirements – called "Emission Unit Criteria" or "EUC" in A39-3 – will be adopted in the form of a SARP. A39-3 does not make any concrete stipulations, except that:

- Units generated from mechanisms under the UNFCCC and the Paris Agreement will be deemed eligible "provided they align with decisions by the Council";
- EUC must "[take] into account relevant developments in the UNFCCC and Article 6 of the Paris Agreement"[108];
- The generation of emission units which benefit developing countries shall be promoted; and that

[106] ICAO Assembly Resolution A39-3, available at https://www.icao.int/Meetings/a39/Documents/WP/wp_530_en.pdf (last accessed on 21 August 2018).

[107] For a current list, see https://www.icao.int/environmental-protection/CORSIA/Pages/state-pairs.aspx (last accessed on 2 August 2018).

[108] A39-3, sec. 20.c.

- Countries are encouraged to develop "domestic aviation-related projects".

On process, A39-3 further stipulates that the Council at all stages receives the "technical contribution" of the Committee on Aviation Environmental Protection (CAEP), a technical committee of the Council in existence since 1983, and that the Council establish a standing technical advisory committee to "make recommendations to the Council on the eligible emission units for use under CORSIA".109 In response, the Council, at its 211th Session (in June 2017), requested the CAEP to "make further progress on the application of the [EUC], including the informal testing of some programmes against the criteria, with a view to providing technical contribution to the Council, when requested, on the establishment of a Technical Advisory Body (TAB) and its process of work to evaluate programmes and make recommendations to the Council on the eligible emissions units for use by CORSIA, as per Assembly Resolution A39-3, operative clause 20 d)."[110]

In December 2017, ICAO distributed to its member states the SARP draft rules ("CORSIA package").[111] In June 2018, the ICAO Council adopted a first set of SARP concerning the MRV of CO2 emissions from flights. The adoption of the draft rules concerning, among others, the determination of eligible emission units has been postponed, however. It is planned for these to be adopted in November 2018. The agenda comes with a caveat, however. Nations are at odds over the need (or merit) of establishing a centralized governance structure, and the potential for CDM credits to be automatically and without vintage restriction eligible under CORSIA is particularly controversial.[112]

5.2.2 Rules on Environmental Integrity

The draft rules on are still vague on several key aspects, in particular the sectoral scope, the question of required levels of aggregation (projects, programs, sectoral approaches), and various issues of institutional concentration (centralized vs. decentralized approaches)[113]. However, they do identify mandatory principles, which relate to most of the characteristics of environmental integrity discussed in this report. These principles, the Draft Rules insist in the "Implementation Elements" ("IE"), must be met at the "program", i.e. standard level (see IE, 2.4). ICAO will test each program approved in accordance with these principles. The principles are the following:

5.2.2.1 Results-Based

The Draft Rules are categorical in that only ex-post verification should be allowed. "Programs that conduct ex-ante issuance (e.g., issuance of offset units before the emissions reductions and/or carbon sequestration have occurred and been third-party verified) should not be eligible".

[109] A39-3, sec. 20.d.

[110] ICAO Council 2017, quoted from International Coalition for Sustainable Aviation (ICSA), ICSA views on the development of the CORSIA Technical Advisory Body (June 2018), at https://icsa-aviation.org/wp-content/uploads/2018/06/ICSA-views-TAB-June-2018.pdf (last accessed on 22 August 2018).

[111] ICAO 2017: International Civil Aviation Organization, Proposal for the First Edition of Annex 16, Volume IV, concerning Standards and Recommended Practices relating to the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), Montreal 2017, accessible at https://icsa-aviation.org/wp-content/uploads/2018/01/ICAO_CORSIA_draft_-SARP.pdf (last accessed on 21 August 2018).

[112] Carbon Market Watch, News Item Posted on 28 June 2018 by Kelsey Pearlman: UN aviation body delays decision on key rules for airline offset scheme, at https://carbonmarketwatch.org/2018/06/28/un-aviation-body-delays-decision-on-key-rules-for-airline-offset-scheme/ (last accesed on 21 August 2018).

[113] The exception concern registry functions, which are proposed to follow a centralized structure.

5.2.2.2 Independent validation and verification

The Draft Rules require that programs have in place "validation and verification standards and procedures, as well as requirements and procedures for the accreditation of validators and verifiers." All procedures should be "publicly disclosed". The Draft Rules do not include specific details for validation whether at project or methodology level. They demand generally, however, that "[emissions] reductions should be calculated in a manner that is conservative and transparent" and that "[offset] credits should be based on accurate measurements and quantification methods/protocols".

For the verification process, the Draft Rules put an emphasis on the need to obtain verification by "an accredited and independent third-party verification entity.

5.2.2.3 Monitoring and measurement

Again, the Draft Rules contain no particular details, but they clarify that "[monitoring], measuring, and reporting of both the emissions reduction activity and the actual emissions reduction from the project should, at a minimum, be conducted at specified intervals throughout the duration of the crediting period."

5.2.2.4 Additionality

The Draft Rules specify that eligible offset credit programs should clearly demonstrate that the program has procedures in place to assess/test for additionality and that those procedures provide a reasonable assurance that the emissions reductions would not have occurred in the absence of the offset program." Where programs pre-define certain activities as automatically additional (e.g., through a "positive list" of eligible project types), then they have to provide clear evidence on how the activity was determined to be additional. The criteria for such positive lists should be publicly disclosed and conservative. If programs do not use positive lists, then project's additionality and baseline setting should be assessed by an accredited and independent third-party verification entity and reviewed by the program.

5.2.2.5 Permanence and Longevity

The Draft Rules state that both emission reductions and removal activities are eligible, as long as the risk of reversal is addressed through "mitigation measures… to monitor, mitigate, and compensate any material incidence of non-permanence".

The statement is important on two levels. First, it provides a clear indication that CORSIA will be open to land use projects. Second, it is also open to the use of compensation measures, which is likely to include buffer solutions as offered by the leading land-use-focused voluntary standards (see chapter 3.2.5. By contrast, there is no immediate indication that emission reduction projects will be spared the need for compensation measures on the ground that they may not include a risk of reversal (on the risk: ibidem).

No indications are made concerning longevity benchmarks or minimum requirements.

5.2.2.6 Leakage

On leakage, the Draft Rules mention that "offset credit programs should have an established process for assessing and mitigating leakage of emissions that may result from the implementation of an offset project or program."

5.2.2.7 Double Counting

The basic commitment in the Draft Rules is that emission reduction activities "are counted only once towards a mitigation obligation". More specifically, the Draft Rules lay down the need to install measures to avoid

- "Double issuance (which occurs if more than one unit is issued for the same emissions or emissions reduction)";
- "Double use (which occurs when the same issued unit is used twice, for example, if a unit is duplicated in registries)"; and
- "Double claiming (which occurs if the same emissions reduction is counted twice by both the buyer and the seller (i.e., counted towards the climate change mitigation effort of both an airline and the host country of the emissions reduction activity)). In order to prevent double claiming, eligible programs should require and demonstrate that host countries of emissions reduction activities agree to account for any offset units issued as a result of those activities such that double claiming does not occur between the airline and the host country of the emissions reduction activity".

From the perspective of environmental integrity, double counting is arguably the most contentious issue in CORSIA.[114] This is because offsets will have to come from economic sectors outside the sector of international aviation. With that, the offsetting market touches upon the accounting framework as laid out by the Paris Agreement and the individual country commitments ("Nationally Determined Contributions" or "NDCs").

The NDCs do not account for international emissions from aviation. At the same time, emission reductions would be turned into net pollution rights if they were accounted for as a credit or offset both under an NDC and under CORSIA. For more details on double counting challenges in the NDC environment, see chapter 2.2.5.

While ICAO firmly states that double counting must be avoided, the authors are not aware of a concrete proposal yet how this could be effectively achieved.

5.2.2.8 Safeguards and Co-Benefits

The Draft Rules include a no-net-harm commitment. They state that "[offset] projects should not violate local, State/provincial, national or international regulations or obligations." Also, "[offset programs should show how they comply with social and environmental safeguards and should publicly disclose which institutions, processes, and procedures are used to implement, monitor, and enforce safeguards to identify, assess and manage environmental and social risks."

5.2.2.9 Small-Scale Project Considerations

The Draft Rules do not address small-scale interventions per se. This, however, is explained by their macro-level focus. They are defining rules for large-scale programs and standards. It will be for the standards to specify formats for different project sizes.

[114] Biniaz, S., ICAO's CORSIA and the Paris Agreement: Cross-Cutting Issues, C2ES (October 2017), accessible at https://www.c2es.org/site/assets/uploads/2017/10/icaos-corsia-paris-agreement-cross-cutting-issues.pdf (last accessed on 21 August 2018).

5.2.3 Rules on Markets and Transactions

The organization of the offset market has received comparably little attention, except for the continuous debate whether the CDM should be recognized as an automatic and unrestricted source of supply. While the CDM legacy supply represents an important issue (see below, chapter 5.2.3.2), the creation of a robust offset market place faces a number of challenges, namely:

5.2.3.1 Program Supply and Demand

As of the second phase in 2024 at the latest, firm surrender obligations will be imposed on airplane operators, and it is ultimately on them to secure supply. On the presumption that annual demand will be in the hundreds of millions of offset units (around 2.7 billion tCO2eq. between 2020 and 2035 in total), this will be no small task, in particular when seen against the emerging competition for offset credits from within the Paris Agreement.[115]

ICAO will be under some pressure to approve eligible programs, with the evaluation work being prepared by the above mentioned Technical Advisory Body (TAB), which has yet to be established. This said, unrestricted use of the CDM could provide up to 5 billion credits after 2020.[116] Yet, without the CDM, secure supply is less evident. The Forest Carbon Partnership Facility (FCPF) could be in a position to supply some 55 million REDD+ credits annually; it is yet to become operational, however. The voluntary standards have a combined issuance rate of less than 60 million annually, even though the issuance rate of the largest standard, the VCS, recently jumped from 33 million to about 50 million in a single year.[117]

5.2.3.2 Price Forecasts

Price forecasts change dramatically depending on the calculation method.

ICAO calculates its prices on the basis of a modeling exercise of the International Energy Agency (IEA), which projected different price scenarios for global emissions trading regimes – such as the European Emissions Trading Scheme (EU ETS) – for the years 2020 and 2030. According to these scenarios, CORSIA offset prices will be between US$ 6-20 in 2025 and between US$ 12-40 in 2035.[118]

Another methodological approach compares country targets (NDCs) and the gap towards a 2 degree Celsius-scenario and calculates that CORSIA offset prices, in line with global carbon prices, would need to move to US$ 33.9 in 2020, US$ 43.2 in 2025, US$ 55.2 in 2030 and US$ 70.

Again, price levels are very different, when the modeling is done from the perspective of actual credit supply. This has recently been done for the known supply of CDM credits. Assuming full eligibility of CDM credits under CORSIA irrespective of the vintage and the date of the investment decision would keep a price ceiling per unit below EUR 1 into the late 2030s.[119] Even in a scenario that restricts CDM credits to vintages from 2016 onwards, CORSIA would barely

[115] Piris-Cabezas, P. et al., Carbon prices under carbon market scenarios consistent with the Paris Agreement : Implications for the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), EDF 2018, at https://www.edf.org/sites/default/files/documents/CORSIA%20Carbon%20Markets%20Scenarios_0.pdf (last accessed on 22 August 2018).

[116] Schneider, L. / La Hoz Theuer, S., Using the Clean Development Mechanism for nationally determined contributions and international aviation, SEI 2017, at https://www.sei.org/mediamanager/documents/SEI-PR-2017-Using-the-Clean-Development-Mechanism.pdf (last accessed on 22 August 2018).

[117] Verra Newsletter, March 2018, http://verra.org/march-2018-newsletter/ (last accessed on 22 August 2018).

[118] ICAO, at https://www.icao.int/environmental-protection/Pages/A39_CORSIA_FAQ3.aspx (last accessed on 22 August 2018).

[119] Fearnehough, H. et al., Marginal cost of CER supply and implications for demand sources (Discussion Paper, DEHSt 2018), at https://newclimate.org/wp-content/uploads/2018/03/Marginal-cost-of-CER-supply.pdf (last accessed on 22 August 2018).

see a higher price than EUR 1. On the condition of tighter restrictions, prices would move upwards, however. We assume that the price levels would further shift, if one considers shifting baselines due to NDC implementation, as this would produce a lower CDM credit output.

5.3 Offsetting and Article 6 Paris Agreement

Article 6 Paris Agreement (PA) is home to the new treaty's flexible instruments, of which there are three. First, Article 6.2 PA regulates the "international transfer of mitigation outcomes", often referred to as "ITMOs". It allows for decentralized trading, i.e. it permits countries bilaterally or multilaterally to trade emission reductions (or other mitigation results), as accounted in their NDCs, from one country to another. Article 6.4 PA, by contrast, is a centralized "mechanism" to generate emission reductions that may be traded between countries or not. Article 6.8 and 6.9 PA, finally, establish a "framework for non-market approaches" which assists with the implementation of NDCs but does not foresee any trading of emission reductions (or other mitigation results) from one country to another (and arguably also not domestically).

Article 6.8 and 6.9 PA may be operational per so, but neither is Article 6.2 PA nor Article 6.4 PA. They require implementing decisions at the level of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA), which oversees the treaty's implementation and is given legal authority by the Parties to make decisions to that end. It is mandated, in particular, to adopt rules, modalities, procedures and guidelines elaborating various provisions of the Paris Agreement, including its Article 6 PA. The result – called "Paris Rulebook" – is to be delivered by CMA 3, coinciding with the 24th session of the Conference of the Parties (COP), the supreme body of the Convention, to be held in Katowice, Poland, at the end of 2018.

Despite the fact that at the time of writing COP 24 is only months away, many aspects of the Paris Rulebook await substantial consolidation. This notwithstanding, the chair of the body preparing the draft elements concerning Article 6 matters (the Subsidiary Body for Scientific and Technological Advice or "SBSTA") has produced an informal note containing draft elements for CMA decisions on Article 6.2 and 6.4 prior to the inter-session negotiations of May 2008 (Bonn), with a revised version issued at the end of that negotiation round.[120] There is emerging clarity on issues concerning environmental integrity standards, less so on transaction features.

5.3.1 Rules on Environmental Integrity

While the texts on both Article 6.2 PA and Article 6.4 PA are sketchy on many details, they contain a strong commitment to "ensure environmental integrity" as such. This commitment comes with the confirmation that, in the case of Article 6.2 PA, ITMOs must be "real, permanent, additional and verifiable", and in the case of Article 6.4 PA, that mitigation activities deliver "real, measurable and long-term benefits and emission reductions that are additional".

5.3.1.1 Results-Based Finance

"Real", in this context, links to the concept of "results-based" finance, i.e. it must be read as a reconfirmation of a categorical ex-post issuance approach. It also associates a methodologically sound baseline approach, i.e. that emission reductions are monitored, quantified and measured against a rigorously calculated hypothetical "baseline" scenario.

[120] SBSTA Chair's Corner, Collection of Informal Notes, SBSTA 48, Agenda Item 12(a) and 12(b), at https://unfccc.int/process-and-meetings/conferences/bonn-climate-change-conference-april-2018/sessions/sbsta-48#eq-24 (last accessed on 23 August 2018).

5.3.1.2 Independent Verification

Both SBSTA draft documents reference the need for "verification", which must be understood as an evaluation by an independent body. The SBSTA draft text on Article 6.4 PA makes this explicit ("A designated operational entity to independently review and determine emission reductions…"). The SBSTA draft text on Article 6.2 PA refers to independent verification in its formulation "real, permanent, additional and verifiable" only, which may be read as an acknowledgement of greater discretion when it comes to setting up the rules for verification. However, the basic idea remains that verification should be done by someone other than the proponent of the mitigation action.

5.3.1.3 Additionality

The issue is highly relevant in the context of NDC and baseline considerations. The argument can be made that NDCs define the new baseline, to the effect that any interventions must exceed the NDC ambition both to generate emission reductions (or other mitigation outcomes) and to make it through the additionality test. The counter-argument would be that the instruments of Article 6 PA are made to help achieve the NDC target. Thus, they require both baseline definition and additionality-tests that reflect business-as-usual without the NDC.

Predictably, then, the concept of "additionality" is not yet wholly settled. While the SBSTA draft text elements on Article 6.2 PA do not provide any details, the SBSTA draft text on Article 6.4 PA includes several options that still need to be decided. One of the options (Option A) simply refers to the general concept ("Emissions are reduced below those that would have occurred in the absence of the activity.") The other options (Option B and Option C), however, include a specific reference to the NDCs (Option B: "The reduction of emissions goes beyond what would be achieved through the delivery of the NDCs of the host Party"; Option C: not yet spelled out).

One way or the other, the text makes clear that actions in least developed countries (LDCs) and in small island states (SIDS) shall be privileged by exempting them from certain aspects of the additionality test.

5.3.1.4 Permanence and Longevity

The commitment to "permanence" is included in both draft decisions, each time complemented by a mitigation (correction action) option. The SBSTA draft text on Article 6.2 PA lays down the obligation to have "systems [in place] to ensure permanence, including to address reversals"; the SBSTA draft text on Article 6.4 PA specifies in this regard that activities must "deliver permanent emissions reductions/ensure permanence and avoid and/or require correction of reversals". This is a clear indication that those sectors that are subject to a permanence risk – namely the land-use sector – are not seen as a priori failing the permanence test. Rather, the draft decisions foresee that actions in these sectors can be designed in such a way as to ensure compliance with the Art. 6 PA requirements. This appears to be an implicit approval of buffer and insurance regimes applied by voluntary standards.

No indications are made concerning longevity benchmarks or minimum requirements.

5.3.1.5 Leakage

The SBSTA draft text on Article 6.2 PA requires participating Parties to "mitigate leakage risks". The SBSTA draft text on Article 6.4 PA does not refer to the issue.

5.3.1.6 Double Counting

The risk of double counting is prominently addressed across the Paris framework, including the Paris Decision (the COP decision accompanying the Paris Agreement) as well as Article 6.2 PA

itself and Article 6.5 PA (referring to Article 6.4 PA). It is, thus, not surprising, that the issue of double counting assumes a dominant spot in the draft CMA decisions, too.

The SBSTA draft text on Article 6.2 PA defines the different constellations in which double counting can occur, namely "double claiming, double issuance, double registration or/and double use". It further specifies that double claiming not only includes the situation in which two Parties claim the same mitigation outcome to their NDC or inventories but also in which one Party claims it towards its NDC and "the same, or another, Party or any stakeholder of the same ITMO/mitigation outcome for a purpose other than towards achievement of its NDC". The latter specification is still contentious, however. If the text element prevails, this would have ramifications for voluntary carbon markets, too, in which "other stakeholders" claim specific mitigation outputs.

The SBSTA draft text on Article 6.4 PA includes a chapter on "Avoiding the use of emission reductions by more than one Party". It also has a separate chapter on "Safeguards/Other", in which several cross-sectoral double counting instances are listed as prohibited. They include the situation in which the emission reductions are used for the purpose of "voluntary climate actions that are not mandatory in the relevant jurisdiction" and another one, in which they are used to demonstrate climate finance. In these cases, the Art. 6.4 PA emission reductions "[shall] [should] not be used towards achievement of an NDC".

5.3.1.7 Safeguards and Co-Benefits

The concept of safeguards and co-benefits is dealt with on three levels. First, they include a no-harm provision. The SBSTA draft text on Article 6.2 PA puts as a participation requirement that it has a process in place to ensure that ITMOs do not "result in environmental harm", do not "adversely affect human rights" and do not "have negative social or economic impacts on any Party". It also formulates "environmental integrity standards" for ITMOs, which prohibit any actions that "imply risks of conflicts with other environment-related aspects" and require with the Sustainable Development Goals and the respect of human rights. According to the SBSTA draft text on Article 6.4 PA, this mechanism is not open to "activity types that have negative environmental impacts", and it obliges Parties to provide an explanation as to how a proposed activity conforms to the Sustainable Development Goals.

Both SBSTA draft texts include a chapter on "Addressing negative social and economic impacts", in which Parties, with the assistance of the UNFCCC secretariat (Article 6.2 PA) or the "Supervisory Body" (Article 6.4 PA), assess at a general level negative social and economic impacts related to Article 6.2 PA and regularly share among themselves the "impact of the implementation of response measures".

Second, the SBSTA draft texts lay down the obligation for Parties to contribute a "share of proceeds" from any transactions to be used to assist "developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation". For the mechanism of Article 6.4 PA, as an alternative funding of the Adaptation Fund is proposed. While the principle to provide a share of proceeds for adaptation purposes is agreed on, however, the details still are much disputed.

Aside from the mandatory share of proceeds, the SBSTA draft text on Article 6.2 PA also includes a placeholder for the promotion of adaptation actions with "mitigation co-benefits".

Third, trading under the Article 6.2 PA and 6.4 PA instruments seeks to result in an "overall mitigation in global emissions", i.e. it aims at going beyond offsetting (or the equivalence of debit and credit). While the details are still heavily disputed, the general idea is to have some of the

mitigation outcomes (Article 6.2 PA) or emission reductions (Article 6.4 PA) discounted or canceled without using them against an NDC.

5.3.1.8 Small-Scale Project Considerations

The draft texts do not include provisions that would address simplified methods for small-scale project development. They do address the need for simplified procedures for LDCs and SIDS, which may ultimately mean preferential treatment of certain small-scale interventions that can be identified with the relevant country groups. Also, the CDM legacy suggests the development of small-scale methodological approaches as part of the mechanism roll-out. Currently, however, no specific plans have emerged.

5.3.2 Rules on Markets and Transactions

Given that fact that the Article 6 PA instruments are still in the development phase and that the demand spectrum is still fairly opaque, both the shape and the size of the future market are hard to predict. Most clarity concerns the registry environment.

5.3.2.1 Program Supply and Demand

Many developing countries have signaled in their NDCs that they are open for the use of the Article 6 PA instruments or, at least, that they are open to considering it. At the same time, several industrialized countries have also indicated a willingness to purchase emission reductions on international markets, namely Canada ("international mechanisms") [121], Switzerland ("carbon credits from international mechanisms")[122] New Zealand ("international market mechanisms")[123] , and Japan, which intends to continue with its existing international trading instrument, the "Joint Crediting Mechanism", in the future. [124] The World Bank and Ecofys count 88 Parties, representing some 56% of global emissions, willing to consider the use of the Article 6 PA mechanisms.[125]

This said, few countries, if any, have given clear indications at what quantitative levels and along wich timetable they wish to use mechanisms. Perhaps the NDC update – due in 2020 – will bring more clarity. There will certainly be an expectation that countries formulate transaction plans should COP 24 / CMA 3 (at the end of 2018) deliver Paris Rulebook decisions on Article 6.2 PA and Article 6.4 PA.

So far, however, no Article 6 PA trade has occurred or has been fully prepared. There are a few initiatives working towards an Article 6 PA trade, notably the US$ 200 million-strong Transformative Carbon Asset Facility, supported by Norway (US$ 80 million), the UK (US$ 76.2 million), Sweden (US$ 25 million) Switzerland (US$ 25 million), Canada (US$ 2.3 million) and

[121] Canada, First NDC, accessible at http://www4.unfccc.int/ndcregistry/PublishedDocuments/Canada%20First/Canada%20First%20NDC-Revised%20submission%202017-05-11.pdf (last accessed on 18 June 2018).

[122] Switzerland, First NDC, accessible at http://www4.unfccc.int/ndcregistry/PublishedDocuments/Canada%20First/Canada%20First%20NDC-Revised%20submission%202017-05-11.pdf (last accessed on 18 June 2018).

[123] New Zealand, First NDC, http://www4.unfccc.int/ndcregistry/PublishedDocuments/New%20Zealand%20First/New%20Zealand%20first%20NDC.pdf (last accessed on 18 June 2018).

[124] Japan, First NDC, accessible at http://www4.unfccc.int/submissions/INDC/Published%20Documents/Japan/1/20150717_Japan%27s%20INDC.pdf (last accessed on 18 June 2018.

[125] World Bank and Ecofys, State and Trends of Carbon Pricing (2018), at https://openknowledge.worldbank.org/bitstream/handle/10986/29687/9781464812927.pdf?sequence=5&isAllowed=y (last accessed on 24 May 2018).

also Germany (US$ 2 million).[126] A single transaction value is planned to be in the range of US$ 30-50 million, but the pricing mechanisms are not yet set.

A recent calculation expects the potential global trading volume between 2020 and 2035 to be at around 77 to 109 billion tCO2eq. (without REDD+) and 147 billion tCO2eq. (with REDD+).[127] It is largely uncertain, however, whether this potential volume can be realized.

5.3.2.2 Price Forecasts

As long as the Article 6 PA instruments are not in place and more clarity is gained concerning the appetite among Parties to use them, price forecasts are difficult. From a standpoint of mere economic planning (with a view to reaching the Paris targets), prices should be in the range of US$ 40-80 per tCO2eq. by 2020 and US$ 50-100/tCO2eq. by 2030.[128] The above-mentioned study on trading volume projects a global carbon price of US$ 70 per tCO2eq., on the condition that global mitigation ambition is compatible with the Paris target of a 2-degree Celsius ceiling for average temperature increase. [129]

5.4 Eligibility and Suitability of Peatland Carbon Projects

Both CORSIA and the Article 6 PA instruments provide immense opportunities for carbon project and program development. Peatland carbon projects may benefit from this opportunity, as long as they are designed in compliance with the relevant rules. While these are not yet fully developed and are still subject to change, the CORSIA Draft Rules and the draft texts for CMA decisions on Article 6.2 PA and Article 6.4 PA offer likely regulatory scenarios against which a model peatland standard ("Model Peatland Standard"), to be developed in line with chapter 4, can be (tentatively) mapped.

5.4.1 Matching Requirements: Environmental Integrity

In terms of environmental integrity requirements and benchmarks, the match is mostly positive both against CORSIA as well as against both market instruments of Article 6 PA – Article 6.2 PA and Article 6.4 PA – even though a number of caveats are in order (see table 25).

It is noted that the current practice of some standards to allow ex-ante crediting would likely disqualify them, as both rule systems insist on "Results-Based Finance". The Model Peatland Standard, however, restricts itself to ex-post crediting (see chapter 4.3). Thus, the relevant match is successful. Independent validation and verification represent a key principle characterizing the Model Peatland Standard as much as the three regulated instruments (even though the Article 6 PA instruments do not mention validation per se).

Additionality and the suggestion to create a positive list under the Model Peatland Standard is in line with the requirements under CORSIA. The situation for Article 6 PA instruments may be more challenging in that NDC targets could become integrated in the baseline and in the

[126] Bloomerberg Portal, Canada, U.K. Plan the First Paris Climate Deal Carbon Trades (16 August 2018), at https://www.bloomberg.com/news/articles/2018-08-16/canada-u-k-plan-the-first-carbon-trades-in-paris-climate-deal (last accessed on 25 August 2018).

[127] Environmental Defense Fund, Carbon prices (see above), at https://www.edf.org/sites/default/files/documents/CORSIA%20Carbon%20Markets%20Scenarios_0.pdf (last accessed on 25 August 2018).

[128] High-Level Commission on Carbon Prices, Report of the High-Level Commission on Carbon Prices (Washington 2017), at https://static1.squarespace.com/static/54ff9c5ce4b0a53decccfb4c/t/59b7f2409f8dce5316811916/1505227332748/CarbonPricing_FullReport.pdf (last accessed on 24 August 2018).

[129] Ibidem.

additionality test. Such a move does not necessarily prevent a positive list approach, but it would need to be checked per country.

All three regulated standards seem open to the use of collateral (buffers) when demonstrating permanence, which indicates another match with the Model Peatland Standard. We note, however, that a conflict might arise, if the Model Peatland Standard were to remove buffer requirements entirely from emission reduction interventions.

None of the regulated mechanisms has particularly detailed requirements on leakage. The Model Peatland Standard will rely on proven practices from existing standards. We assume, therefore, that securing a match will be non-problematic. Double counting, on the other hand, will present a lasting challenge for the Model Peatland Standard. This challenge will likely be of particular relevance vis-à-vis CORSIA. Finding a practical way forward, without risking generating hot air within the NDCs will be demanding. For the Article 6 PA instruments, this risk is addressed (though the particular provisions are still contentious, and the matter needs to be reassessed once the draft decisions are finalized).

Concerning safeguards and co-benefits, there are no obstacles in substance. It is noted, however, that the requirements in the Article 6 instruments will add mandatory thresholds in the form of a share of proceeds for adaptation purposes as well as in the form of a net benefit for the climate (through discounting or canceling units). That would not create incompatibilities with the Model Peatland Standard. However, it will add to the costs.

Lastly, none of the regulated standards reflect on small-scale options for project development. Given the history of the CDM, however, it seems fair to expect similar rules for the Article 6 instruments. When it comes to CORSIA, the situation is more complex. CORSIA will likely seek the vetting of large-scale programs and standards. While this does not prevent small-scale developments within these standards, it is likely to act as a barrier to peatland standards at large, as long as they remain small.

Table 25 Mapping of key characteristics concerning environmental integrity between the Model Peatland Standard as described in chapter 4 (column on the left) and the likely requirements of CORSIA and the instruments Article 6.2 and Article 6.4 of the Paris Agreement. The green color indicates a full match. The orance color indicates potential challenges.

Table 25 Mapping of key characteristics concerning environmental integrity between the Model Peatland Standard as described in chapter 4 (column on the left) and the likely requirements of CORSIA and the instruments Article 6.2 and Article 6.4 of the Paris Agreement.

Model Peatland Standard	CORSIA	Article 6.2 PA	Article 6.4 PA
Results-Based Finance	Match	Match	Match
Independent Validation and Verification	Match	Match	Match
Additionality	Likely match	NDC projection into the baseline may question the positive list approach	NDC projection into the baseline may question the positive list approach

Model Peatland Standard	CORSIA	Article 6.2 PA	Article 6.4 PA
Permanence / Longevity	Buffer approach is likely to be accepted Attention, though, if emission reduction projects do not contain buffer holdings; they may be rejected on permanence grounds	Buffer approach is likely to be accepted Attention, though, if emission reduction projects do not contain buffer holdings; they may be rejected on permanence grounds	Buffer approach is likely to be accepted Attention, though, if emission reduction projects do not contain buffer holdings; this may be rejected on permanence grounds
Leakage	Match	Match	Match
Double Counting	Double counting represents major challenge CORSIA may require full corresponding adjustment against NDCs	Match (Article 6 PA will secure single accounting rule)	Match (Article 6 PA will secure single accounting rule)
Safeguards and Co-Benefits	Likely match	Article 6.2 PA sets specific requirements concerning the share of proceeds and concerning the global mitigation benefit (going beyond offsetting); These will need to be built into the Peatland Standard;	Article 6.4 PA sets specific requirements in re share of proceeds and in re global mitigation benefit (going beyond offsetting); These will need to be built into the Peatland Standard;

5.4.2 Matching Requirements: Markets and Transactions

For the area markets and transactions, the mapping exercise comes with considerable uncertainties. Especially concerning Article 6 PA instruments, many crucial elements remain open, above all whether Parties will agree on an operational mechanism in the first place. Until that happens, future demand and supply largely remain a black box. However, certain developments – presenting themselves in the form of opportunities and challenges – may be anticipated (see table 26).

First, within CORSIA, the extent to which peatland project development has a chance depends largely on the measure at which CDM credits will be permitted as eligible offset units. This is a question of pricing (CDM credit prices are expected to stay below 1 EUR per tCO2eq. well into the 2030s) but also of robust supply expectations and risks in general. Peatland carbon projects are still new and untested as a large-scale credit supplier. Airplane operators will likely opt for lower-risk credits. This said, other arguments may be made towards operators, in particular the argument of local sourcing: Peatlands are found in virtually all countries, and they are under threat in most countries. An airline operator, then, does not necessarily have to look far when it comes to potential credit sourcing. Peatland credits could be locally sourced.

Next to inciting demand, a profound obstacle may be presented in the ICAO vetting process. Small programs (standards) may face difficulties against big players (such as the FCPF or, indeed, the CDM). Integration within bigger ('umbrella') programs (such as the FCPF, perhaps also Verra) may reduce the risk of not being vetted. But then, again, other project types within

the umbrella may have a clear price advantage, and some programs (such as the FCPF) only operate in developing countries.

For the Article 6 PA instruments, the situation is different. Article 6.2 PA encourages bilateral transactions. The interventions backing such transactions will more often than not be large. However, there is no size-fits-all consideration. As the bilateral trades under the Kyoto Protocol have shown, smaller buyer countries will often purchase from smaller programs. This means that there is an opportunity for peatland interventions, even if they are small in size. One challenge is similar in both Article 6.2 PA and CORSIA, however: peatland restoration action in industrialized countries is likely to suffer from the structural disadvantage of being more expensive than other actions. Furthermore, while there is no rule of the sort that Article 6.2 PA can be used only with respect to certain countries, two types of transactions are the most likely ones: On the one hand, transactions between industrialized countries (buyers) and developing countries (seller), and on the other hand, linking operations in which emissions trading schemes are linked between different countries. Peatlands in industrialized countries will most likely not fall under either type. While peatlands from developing countries may be included in a North-South deal, those peatlands located in purchasing countries will likely not benefit.

Table 26 Mapping of key characteristics concerning markets and transactions between the Model Peatland Standard as described in chapter 4 (column on the left) and the likely requirements of CORSIA and the instruments Article 6.2 and Article 6.4 of the Paris Agreement.

Model Peatland Standard	CORSIA	Article 6.2 PA	Article 6.4 PA
Supply and Demand	If CDM is allowed without tight restrictions, peatland-based emissions will hardly be competitive (higher risks, higher costs, see below). ICAO vetting process may be challenging for small standards; integration in larger standards (e.g. AFOLU/REDD+) may help; Peatlands provide a particular opportunity for airplane operators in temperate zones that wish to invest in projects "at home".	Extent to which the instrument will be used is unclear. Most attention will go to interventions in (low-cost) developing countries. Other sectors likely to be prioritized however (energy, transport); Potentially, emission reductions in the land-use sector could be treated as an "add-on" to an energy- or transport transaction to secure an overall net-benefit – this remains speculative for now, however.	Extent to which the instrument will be used is unclear; Most attention will go to interventions in (low-cost) developing countries. Other sectors likely to be prioritized however (energy, transport); Potentially, emission reductions in the land-use sector could be treated as an "add-on" to an energy- or transport transaction to secure an overall net-benefit – this remains speculative for now, however.
Price Forecast	ICAO's price scenario is $ 6-20 per tCO2eq. in 2025 and between US$ 12-40 per tCO2eq. in 2035; A range of peat interventions will be	Price forecast difficult; A Paris-compliant price is US$ 40-80 per tCO2eq. by 2020 and US$ 50-100/tCO2eq;	Price forecast difficult; A Paris-compliant price is US$ 40-80 per tCO2eq. by 2020 and US$ 50-100/tCO2eq;

Model Peatland Standard	CORSIA	Article 6.2 PA	Article 6.4 PA
	feasible (in developing countries), but the price profile is challenging in temperate zone / industrialized countries.	This would allow wide peat-focused interventions.	This would allow wide peat-focused interventions.

The prospects are good for North-North linking operations in general, but then the chance is low that peatland related emissions will be included in an emissions trading scheme of either country in the first place. Where it does – the EU from 2021 has a comprehensive legal framework to reduce overall GHG emissions by at least 40% by 2030 (compared to 1990 levels – the targets relating to the LULUCF segment are weak in ambition (and peatland-related emissions will often be absorbed by removal gains from forest management which is accounted under the same trading scheme).

The Article 6.4 PA mechanism may well turn out to offer the largest potential for peatland carbon projects. The mechanism is likely to be open both for small- and large-scale interventions, and indeed the CDM legacy lets one predict that special incentives in the form of simplified methodologies will be offered for small- and micro-interventions. Moreover, specific investment profile may benefit peatland projects. On the one hand, non-state actors may become active (voluntary) participants in the mechanism (as investors/buyers). These more may be attracted by the high environmental quality of peatland interventions as well as by the prospect to source credits close to home.

On the other hand, the Article 6.4 PA mechanism may become a tool of international climate finance. Just as the FCPF is a carbon-based platform to channel investments into REDD+, Article 6.4 PA may be used to organize climate interventions and to measure results. The carbon trading element, in these instances, may be less relevant. Within the FCPF, the vast majority of donors do not intend to use the credits. Should Article 6.4 PA be used in a similar way – the draft decision mentions the alternative climate finance option, to be sure – peatland-based investments may again be of particular interest for their wide co-benefits in terms of adaptation, livelihoods improvement, clean water, etc. The price-per-credit competition with other sectors, then, perhaps loses significance.

There are no major registry-related obstacles in either of the trading instruments. CORSIA relies on decentralized, program-specific registry functions. Article 6.2 PA requires national registry functions in each participating country, and Article 6.4 PA will rely on a centralized registry supported by the mechanism itself.

5.5 Recommendations

In the following, options are presented to facilitate the integration of peatland carbon projects in CORSIA and the Article 6 PA instruments. The options vary with respect to agency (responsible actor), and the key agent is highlighted in each option.

5.5.1 CORSIA

A practical challenge in CORSIA may relate to the vetting process, which – though open to any program in theory – is likely to favor large programs and standards leaving smaller peatland standards, assuming they exist, behind. Then, among the admitted programs, peatland projects may face fierce competition from project types, whose abatement costs are lower and which involve lower implementation risks.

Peatland standards should respond by playing up their strengths:

5.5.1.1 Double Counting (Key agents: Standard developers and governments)

Standard developers should formulate simple, easy-to-implement and robust double counting rules. This is an area, in which peatland projects may have indeed some leverage over other sectors: As emissions from peatlands are still rarely accounted for, there is less risk of actual double counting. A peatland standard could market itself to CORSIA as double-counting free, provided it sources from countries only, where NDC and other targets exclude emissions from peatlands.

The standard should allow, then, the issuance of CORSIA-compatible credits in countries that do not account under their NDCs for peatland emissions under their NDC, but it should set a firm deadline, until when projects must be registered (e.g. 2025) and until when they can issue credits (e.g. until 2035). Without the deadline, the standard would run the risk of creating counter-incentives, i.e. countries would exclude peatland emissions from their NDCs so as to participate in the voluntary / CORSIA market. With such a deadline, on the other hand, projects are encouraged to move ahead and to register and become operational as soon as possible.

At a general level, voluntary standards should offer the option to ringfence mitigative action against double-counting. The wide availability of CDM credits presents an opportunity, in this respect. For each peatland credit issued, one CER should be retired. The retirement would have a twofold effect, meant to reassure the aviation industry that double counting is avoided and that the credit moves beyond offsetting.

Governments interested in promoting voluntary peat carbon projects to supply CORSIA can help mitigate the double counting challenge by formally adopting clear double counting rules. These could be modeled as follows:

> "*The Peatland Standard ___ ("Program") is a recognized offsetting standard. An amount of ___ units is reserved each year from the national accounting system ("Reserve") to back credits issued under the Program. An amount equivalent to the total amount issued will be retired from the Reserve….*"

Such a "Reserve" would act as the equivalent to a 'corresponding adjustment' foreseen for country-to-country transactions under Article 6.2 PA.

5.5.1.2 Local sourcing (Key agents: Project developers and governments)

CORSIA encourages countries to develop "domestic aviation-related projects". The ubiquity of peatlands makes domestic sourcing a concrete possibility. Peatlands and adjacent waterbodies in the vicinity of aviation operations could be targeted as a priority. Governments can help by offering co-funding, by supporting the project development infrastructure (see chapter 4 on supply and demand) and by adopting clear double counting rules (see before).

5.5.1.3 Integration in larger programs (Key agents: Standard developers, project developers, governments)

Integrating a peatland standard into bigger programs seems important to overcome the challenge of insufficient size. For peatlands located in developing countries, a close integration into the FCPF – as a potential program partner for CORSIA – is recommended. So far, FCPF country interventions often include peatland areas (at least those that are forested), without, however, designing specific policies and measures for the peatland restoration itself. Standard developers are encouraged to test their compliance with the FCPF rules and then offer a peatland intervention module to be used for future FCPF developments.

A separate option – of interest particularly for industrialized countries with large peat areas – is to create a dedicated action group with participants coming from governments as well as civil society, business (ideally with participation of the aviation industry), and others. Such an action group would build its own voluntary peat standard to be used under ICAO. A model for the set-up of such an action group (which could be given the title "International Climate Protection Peatlands Action Group") can be found in the Nitric Acid Climate Action Group (NACAG)[130], which also brings governments and business operators – there in the field of fertilizer production – together. NACAG operates both at the "project level" (installation-level) as well as at the intergovernmental level to assist countries with curbing sector-wide emissions and to promote comprehensive integration of the sector within the NDCs. The International Climate Protection Peatlands Action Group could similarly operate, namely (1) provide assistance to project-level interventions both in industrialized and in developing countries, and (2) work towards better accounting for peatland emissions within NDCs. It is noted, in this context, that several countries recently created the "Global Peatlands Initiative"[131] as a form of South-South cooperation (with participation of the Democratic Republic of Congo, the Republic of Congo, Indonesia and Peru). As part of this initiative, the participating countries set up the International Tropical Peatland Center (ITPC) in Jakarta, Indonesia. The ITPC is built on the "principle of true cross-sector collaboration and integration, building a resilient and holistic platform for science, policy and practice, and attracting the best minds working on research and practice in this field".[132] The International Climate Protection Peatlands Action Group may replicate this approach and extend the collaboration to include a North-North and a North-South component.

5.5.2 Article 6 PA Instruments

Moving from the energy-focused carbon transactions of the Kyoto Protocol to a carbon trading environment integrating peat carbon projects is a major step. It will require good-will and diligent preparation at the level of governments, CMA, and the governing body of the future Article 6.4 PA instrument. A few ideas and concept may help facilitate the transformative process.

5.5.2.1 Ringfencing standard characteristics (Key agents: Standard developers)

While we see considerable conceptual leeway to simplify a voluntary carbon standard for peatland protection (see above, chapter 4), we opt for caution and drastic conservatism, when it comes to presenting a Model Peatland Standard for the Article 6 PA instruments. This concerns questions of permanence, first and foremost, but also the creation of simplified procedures for small- and micro-scale projects. It seems of strategic importance to integrate a peatland standard with as few contentious issues as possible.

For the issue of permanence, this means that although we consider peatland emission reduction projects to be without risk of reversal (see above, chapter 3.2.5), we recommend following the practice of the key voluntary standards and define buffer values for all types of peatland projects. This makes the conceptual debate redundant and increases the level of acceptance benefitting the standard as a whole.

[130] http://www.nitricacidaction.org (last accessed on 21 February 2019).

[131] https://www.unenvironment.org/news-and-stories/story/four-countries-global-south-share-peatland-experiences (last accessed on 21 February 2019).

[132] https://www.tropicalpeatlands.org/about-us/ (last accessed on 21 February 2019).

The availability of simplified procedures is important, not least in the context of industrialized countries, but their development should wait. First, a peat methodology should be presented and approved for integration in Article 6 PA. Thereafter, simplification modules may be developed.

5.5.2.2 Prepare bilateral transactions within a larger initiative (Key agents: governments, business)

We advised above that the creation of an international public-private partnership on climate protection and peatlands (dubbed "International Climate Protection Peatlands Action Group") will help create momentum and size for the integration of peatland projects into ICAO. The same can be said about bilateral trade deals on peatlands within Article 6.2 PA. Both the FCPF and NACAG provide useful experience how such a multi-party initiative can be built and how transactions can be structured. The multi-party approach would also have the advantage that a firm double counting policy could be established for application by all partners.

The FCPF is a multi-stakeholder partnership that includes 47 developing forest countries and fifteen financial contributors (developed countries and non-state actors). The FCPF has two separate but complementary funding mechanisms — the Readiness Fund and the Carbon Fund — to achieve its strategic objectives. Both funds are underpinned by a multi-donor fund of governments and non-governmental entities, including private companies that make a minimum financial contribution of $5 million.

In close coordination with developments at the UNFCCC level, the FCPF has built a specific methodological framework for the design and validation of REDD+ programs and robust MRV of emission reductions resulting from the programs. It has also created its own transaction structure with the Carbon Fund, operated through the World Bank, as carbon buyer, and each developing country partner as carbon seller.

The NACAG is a cooperation between governments and private sector entities assisting developing country partners with removing N2O emissions from their nitric acid production operations. Assistance is conditioned on the partner government guaranteeing domestic abatement action from 2021. NACAG does not seek international transfers of emission reductions. However, it aims at host countries including N2O commitments in their NDCs.

The International Climate Protection Peatlands Action Group could follow the model of the FCPF or NACAG, always in close interaction with the emerging mechanisms under Article 6.2 and Article 6.4 PA. Participating developing country partners could be encouraged to draw up a national peatland conservation and restoration plan against the prospect of compensation for the emission reductions achieved. The emission reductions, once transacted, would be retired permanently to avoid any instances of double counting. Non-state actors should be actively engaged, including organizations representing voluntary peatland standards (or voluntary standards with a peatland project portfolio).

5.5.2.3 Bottom-Up Development (Key agents: Experts and project developers)

Beyond concentrating and orchestrating action within a multi-party initiative, peat carbon proponents are encouraged to use the bottom-up infrastructure that Article 6.4 PA is likely to offer. If the methodological development is close to what it was under the CDM, the mechanism will offer stakeholders (in the broadest sense of the word) the right to submit methodological proposals. This time around, permanence issues and regulatory restrictions will not cause an insurmountable bottleneck. Once a methodology – based on the Model Peatland Standard – is proposed and accepted, bottom-up initiatives can use it and demonstrate feasible action on the ground.

5.5.2.4 Strong safeguards and co-benefits (Key agent: standard developers)

Article 6.4 PA may receive targeted investment from both public climate finance proponents as well as private investors. In both cases it will be crucial for the Model Peatland Code to

demonstrate a robust safeguards protocol and standardized complementary indicators (on adaptation, clean water, biodiversity, livelihoods, etc.). These could be offered through the established practice of using labels (cf. the Gold Standard label for CDM credits). Indeed, multiple labels could be added so that a credit could come with e.g. 2, 3, 4 or 5 additional labels.

6 Conclusion

The goals of the Paris Agreement and the 1.5-degree Celsius goal, in particular, cannot be met without significant contributions of the land sector. Given their extraordinary potential as a source and sink of CO_2 emissions, peatlands must be placed at the center of climate change policymaking, implementation and investment. Halting peatland destruction and triggering peatland rewetting and restoration worldwide is key to the 2050 pathway. By the middle of the century, the world must have achieved net-zero CO_2 emissions by balancing global anthropogenic CO_2 emissions and removals.

The multiple benefits and services provided by wetlands are also widely recognized as being essential in achieving global adaptation strategies and the Sustainable Development Goals (SDGs), which represent an ambitious, globally agreed agenda to eradicate poverty and achieve sustainable development by 2030. Healthy peatlands protect vulnerable communities around the globe against the degradation of soils, erosion, fire, flooding, rising sea-levels, and drought.

Against this backdrop, carbon projects offer a unique opportunity for bottom-up investments in peatland restoration and conservation. As they channel climate finance, provide techniques – on rewetting, alternative use, climate engagement, etc. – and as they improve livelihoods, they function as laboratories for sustainable change and innovation: for farmers, local communities, as well as investors.

They may also point the way towards scale and long-term impact. The more projects are being implemented, the more investors as well as regulators take note. Eventually, actual transformations will follow suit.

We are at the beginning of this process only, and the strength of peatland projects yet needs to be demonstrated. While regulatory and market challenges will always prove difficult, carbon standards can go a long way by facilitating project development, making the carbon cycle more manageable, cutting costs, and increasing the value of peatland credits.

We have elaborated a wide range of recommendations targeting both the carbon cycle procedure as well as key methodological elements for peat carbon project development. In our view, the priorities for standards in the short and mid-term should be on the following:

1. Allow a more flexible, “modular” use of methodologies by project proponents, linked to a closer “peer-to-peer” engagement between proponents and validators and supported by pragmatic, proxy-based monitoring options.
2. Encourage small- and micro-level projects by developing off-the-shelf and flexible project design, validation, monitoring and verification formats, allowing for low-end validation and verification costs.
3. Offer short- and mid-term project solutions. 30, 40 or 100-year-permanence requirements make sense for many land-use projects (in particular: A/R and forest management) but they fail to recognize the permanent climate benefit that many short- to medium-term soil carbon interventions have. This is a lost opportunity. Many farmers will be hostile to committing to a certain land-use for several generations; making a similar commitment for 10, 15 or 20 years faces a lot less concern.
4. Reconsider buffer functions: Either remove the buffer requirement for emission reduction projects altogether or at the very least adjust the buffer withholding to the

stock loss risk inherent in a peatland conservation or restoration project. A withholding of 10% will in the vast majority of cases be sufficient.

5. Encourage the development of a methodological paludiculture toolbox tailored to the combination of peatland conservation/restoration, on the one hand, and paludiculture use, on the other hand. The aim should be that standards provide methodologies that permit the combinations of project categories, so that the biomass component in reeds, sphagnum, alder etc. can be accounted for, including in the context of biomass replacing fossil fuel.
6. Prepare individual double counting assessments for each country. Where the emission reductions achieved from a peatland conservation or restoration project are not reflected in an NDC or another national or jurisdictional accounting systems, there is no risk of double claiming for peatland projects. However, the introduction of a sunset provision for projects may be useful in order not to set the wrong incentives for countries (to hold off with comprehensive NDC accounting). Where the emission reductions are or may be accounted for under an NDC or another system, offer a clear set of options to address the risk ("corresponding adjustments", "statements" instead of credits; default mechanisms based on replacement credits).
7. Apply both a safeguards protocol and offer additional certification services. Peatland projects are high-impact projects not just in terms of emission reductions, but also in terms of biodiversity, water economy, climate change adaptation, gender equality, and other. These translate in additional benefits of peat carbon credits which are valued by buyers.
8. Advance linkages with the Forest Carbon Partnership Facility (FCPF) and other suitable programs, if available, to fast-track integration with CORSIA, the offsetting mechanism of international airlines.

Voluntary carbon markets have been developed by non-state-actors, and they function outside any government-regulated system. This notwithstanding, there is plenty governments can do to support voluntary markets, short of turning them into regulated schemes proper. From the list of recommendations developed in this report, our priorities are the following:

1. Establish a peatland climate protection fund that invests in projects through purchasing credits under a reverse auction mechanism and that provides collateral, seed or bridge funding for projects in their early development phase to trigger required investments. The fund could also provide support for project proponents on the side of marketing and market-place creation, as well as registry, post-development and risk pooling services.
2. Facilitate the establishment of professional program coordinators to take on the role as program/project proponents and provide support to program roll-out for small- and micro-scale projects across jurisdictions (regions) or countries. Facilitation and support could come, in particular, in the form of information and help desk services, scientific and operative (including cross-regional) assistance, as well as financial support.

These are short-term to mid-term options both for standards and governments to promote peat project development in both industrialized and developing countries. In the long run, projects to restore and conserve peatlands and use them sustainably must increase in transformative scale, however. For that, policy-level action is required addressing strategic plans, zoning, land tenure, investment climate, and more. And again, carbon markets can support this process. Setting incentives for increased action by opening up carbon compliance markets – ideally starting within the context of Article 6 PA – for offsets and, ultimately, by putting a compliance price on

carbon released through draining peatlands will nudge producers and consumers towards the direction of sustainable land use.

Indeed, compliance markets already, if slowly, are opening up to the sector. While there is still no system in the world with direct coverage of managed peatland areas specifically or the agricultural sector more generally, in the sense that farmers would be obliged to trace their GHG emissions and live up to a continuously more ambitious reduction target, some countries are moving in this direction. New Zealand has introduced mandatory GHG reporting for livestock and fertilizer-related emissions. Other schemes increasingly cover the sector indirectly: as a source of offset credits (particularly practiced in North America) or through providing centralized funding – similar to what is recommended in this report – to encourage carbon project development (as in the case of Australia and California).

In this trajectory, voluntary carbon projects prove essential. They are the pioneers for targeted, innovative action. They demonstrate that sustainable, long-term emission reduction results from peatlands can be achieved, while delivering on highest standards of environmental integrity. They are bottom-up driven, securing community engagement and improving livelihoods. And they provide a robust bridge connecting climate change policy targets with private sector investment. In short, they are the indispensable partner on the pathway to implementing the Paris Agreement.

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