REQUEST FOR INTERNAL REVIEW

UNDER TITLE IV OF THE AARHUS REGULATION

OF

COMMISSION DELEGATED REGULATION (EU) 2026/285 of 3 February 2026 supplementing Regulation (EU) 2024/3012 of the European Parliament and of the Council by establishing the certification methodologies for permanent carbon removals activities

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Submitted via the *Declare – Aarhus Regulation system*

Pursuant to Article 10 of Regulation 1367/2006, as amended by Regulation (EU) 2021/1767, on the application of the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters in Community Institutions and Bodies, and Commission Decision 2008/50/EC of 13 December 2007

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A. Introduction and summary

1. This is a request for internal review ("RIR") by the Applicants under Regulation (EC) 1367/20061 as amended by Regulation (EU) 2021/1767 (the "Aarhus Regulation").2 The Applicants request the European Commission (the "Commission") to review several provisions of the Commission Delegated Regulation (EU) 2026/285 of 3 February 2026 supplementing Regulation (EU) 2024/3012 of the European Parliament and of the Council by establishing the certification methodologies for permanent carbon removals activities (the "Delegated Act" or "DA") on the basis that it contains a number of errors of law and is otherwise unlawful in the respects identified below.

2. The Delegated Act was made by the Commission under its duty in Art. 8(2) of the Regulation (EU) 2024/3012 of the European Parliament and of the Council of 27 November 2024 establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products (the "**CRCF Regulation**").

3. References to Articles of the CRCF Regulation are in the form: Art. X CRCF. References to Recitals to the CRCF Regulation are in the form: Recital X CRCF.

4. References to Articles of the Commission's Delegated Act are in the form: Art. X DA. References to Recitals to the Delegated Act are in the form: Recital X DA.

5. This RIR concerns Biogenic emissions Capture with Carbon Storage ("**BioCCS**") and biochar carbon removal ("biochar") activities. It identifies, and requests the Commission to review, the delta between the standards set in the Delegated Act and the requirements of the CRCF Regulation. In particular, the CRCF Regulation contains several requirements relating to the mitigation of climate change that the Commission was under a duty to faithfully implement through the Delegated Act. The standards set in the Delegated Act, however, do not meet those requirements. In particular, and as set out further below:

    a. In relation to the "quantification" requirements in Art. 4 CRCF, the Delegated Act treats the storage of biogenic carbon dioxide (CO_2) as though it represents removal of CO_2 from the atmosphere. It also calculates the net carbon benefit of an activity (which the CRCF Regulation states must account accurately for the balance of emissions and

[1] Regulation (EC) No 1367/2006 on the application of the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters to Community institutions and bodies [2006] OJ L264/13.

[2] Regulation (EU) 2021/1767 of the European Parliament and of the Council of 6 October 2021 amending Regulation (EC) No 1367/2006 on the application of the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters to Community institutions and bodies [2021] OJ L356/1.

removals) in a way that excludes substantial emissions from: (i) biomass consumed in the activity, (ii) methane (CH_4) emissions, and (iii) indirect land use change ("**ILUC**"). This is unlawful because it is not consistent with the obligations set down in the CRCF.

b. The Delegated Act fails to include monitoring rules for biochar activities that meet the standards set in the CRCF Regulation. This is an unlawful failure to comply with the "*monitoring*" requirements of Art. 6 CRCF.

c. The Delegated Act fails to include minimum sustainability requirements ensuring that BioCCS and biochar activities do no significant harm to multiple environmental objectives. This is clearly not consistent with the "*sustainability*" requirements of Arts. 7 and 8 CRCF and is unlawful.

B. Admissibility of the request

6. Each of the Applicants fulfils the eligibility criteria set out in Art. 11(1) of the Aarhus Regulation, as detailed in the DECLARE system and the Annexes.

C. Factual context to the CRCF Regulation and the Delegated Act

7. As Recital 1 CRCF explains, "*[u]nder the Paris Agreement adopted under the United Nations Framework Convention on Climate Change*", the EU, as part of "*the international community has agreed to hold the increase in the global average temperature well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels*" (the "**Paris Agreement temperature targets**").

8. Following the Paris Agreement, the European Green Deal set EU policy on a path to carbon neutrality by 2050.[3] This is now enshrined in the climate-neutrality objective in Art. 2 of the European Climate Law (the "**ECL**"), with an intermediate target in Art. 4 of a 55% reduction in net GHG emissions compared to 1990 levels by 2030.[4]

9. As Recital 2 CRCF notes, in order to achieve the Paris Agreement temperature targets, reflecting the reports of the Intergovernmental Panel on Climate Change (the "IPCC"), it is essential that "rapid and deep cuts in global greenhouse gas ["GHG"] emissions occur throughout the remainder of this decade and in the coming decades". Recital 2 also notes the IPCC's conclusion

[3] Commission Communication, COM (2019) 640 final, The European Green Deal.
[4] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law').

that, as well as reducing emissions, it is "unavoidable" that there must also be CO2 "removal to counterbalance hard-to-abate residual emissions".[5]

10. EU policy is to seek both "*public and private investment*" to advance the EU's economy towards climate neutrality (Recital 19, ECL). Accordingly, the CRCF Regulation seeks to incentivise carbon removal, carbon storage, and emission reduction activities that have an unambiguous positive climate impact and that contribute to the achievement of the Paris Agreement objectives (see Recitals 3-7, 20, CRCF).

11. The Communication from the Commission to the European Parliament and the Council on Sustainable Carbon Cycles COM/2021/800 (the "**Communication**")[6] recognises the need for a robust framework in this area, "*providing guarantees in terms of environmental integrity*." If the DA fails to achieve those objectives, then it encourages the very "greenwashing" the CRCF seeks to avoid (Recitals 7 and 43).

12. The Commission published its draft Delegated Act and held a "*feedback period*" between 17 July to 22 September 2025.[7] Several of the Applicants, and other organisations associated with them, submitted responses, including Carbon Market Watch,[8] WWF,[9] Fern,[10] and Partnership for Policy Integrity (PFPI).[11]

D. The CRCF Regulation

13. The CRCF Regulation was adopted by the Parliament and Council as co-legislatures on 27 November 2024 ("**the Legislature**"). Its purpose, reflecting the objective set in the ECL and the Communication as set out above, is to create schemes that audit and certify activities that reduce soil emissions and remove carbon from the atmosphere in order to combat global warming and achieve the objectives of the Paris Agreement. Recital 1 to the CRCF Regulation confirms that the overall context (and thus the objective) of the legislation is to "*to hold the increase in the*

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[5] IPCC Climate Change 2023, *Synthesis Report: Summary for Policy Makers*, page 21 https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf; Schleussner, CF. *et al*, *Overconfidence in climate overshoot*, Nature 634, pages 366–373 (2024), page 368. https://doi.org/10.1038/s41586-024-08020-9.

[6] Communication from the Commission to the European Parliament and the Council on Sustainable Carbon Cycles COM/2021/800 final 15 December 2021 at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52021DC0800

[7] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14573-Carbon-removals-and-carbon-farming-methodologies-for-certifying-permanent-carbon-removals_en

[8] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14573-Carbon-removals-and-carbon-farming-methodologies-for-certifying-permanent-carbon-removals/F33067918_en

[9] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14573-Carbon-removals-and-carbon-farming-methodologies-for-certifying-permanent-carbon-removals/F33067986_en

[10] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14573-Carbon-removals-and-carbon-farming-methodologies-for-certifying-permanent-carbon-removals/F33067981_en

[11] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14573-Carbon-removals-and-carbon-farming-methodologies-for-certifying-permanent-carbon-removals/F33067982_en

global average temperature well below 2ºC above pre-industrial levels and to pursue efforts to limit the temperature increase to 1,5ºC above pre-industrial levels". Recital 3 reiterates that the aim of the CRCF Regulation is ultimately to meet the Paris Agreement temperature targets.

14. Accordingly, the goal of the CRCF Regulation is to achieve genuine atmospheric impact by way of carbon removals and emission reductions (this objective is referred to below, in shorthand, as the "***Atmospheric GHG Removal and Reduction Objective***"). Subsequent provisions of the CRCF Regulation should be construed in the light of this wider statutory object and purpose.[12]

15. The means chosen to advance that object and purpose is the financial incentivisation of activities that remove GHGs from the atmosphere, as Recital 2 explains.

16. To advance the Atmospheric GHG Removal and Reduction Objective, the CRCF Regulation differentiates between three types of activities: permanent removals, carbon farming, and carbon storage in products. It consists of two main divisions. First, it sets "*quality criteria*" for activities that reduce soil emissions or remove carbon from the atmosphere. Second, it provides conditions for public and private certification bodies to be authorised by the EC for the purpose of certifying activities that have met the quality criteria.

17. The CRCF Regulation anticipates that financial incentives will be put in place by the market and public authorities to reward those operators that obtain certifications for carbon removals or soil emission reductions from the verification bodies. The Applicants understand the certified reductions and removals should be accounted for by Member States (and the EU) in their nationally determined contributions (NDCs) under the Paris Agreement and count toward emission reduction targets that are set under EU and domestic legislation (Recital 3). Recital 4 indicates that the Commission may in the future decide to account for industrial carbon removals in the Union's emissions trading system.

18. The Legislature set out its intention to hold the Commission to a high level of ambition when making delegated legislation under the CRCF Regulation.[13] Recital 11 sets objectives that have absolute elements (i.e. the Legislature stated an objective that certain positive things will be achieved and certain negatives will not occur). It provides that: "*carbon removals and soil emission reductions should be quantified in an accurate and robust way, and should be generated only by activities that generate a net carbon removal benefit or a net soil emission*

[12] See, Judgment of 3 September 2024, *Illumina v Commission*, C-611/22 P and C-625/22 P, EU:C:2024:677, §186*ff.*
[13] On the admissibility of the Recitals to the CRCF Regulation when construing the obligations imposed on the Commission see: Judgment of 26 June 2001, *BECTU*, C-173/99, EU:C:2001:356, §§37-39.

reduction benefit, are additional and aim to ensure long-term storage of carbon. They should do no significant harm to the environment and should be able to result in a co-benefit in relation to sustainability objectives" (emphasis added). Recitals 13 and 19 are to similar effect.

19. Art. 3 CRCF provides that carbon removals and soil emission reductions shall be eligible for certification where they: (a) are generated by an activity that complies with the quality criteria set out in Arts. 4 to 7, and (b) are verified in accordance with Art. 9 (the conditions for the certification bodies are set in Arts. 9-13 CRCF).

20. This RIR concerns the quality criteria established by the Commission for carbon removals. As set out further below, they must be established in a manner that complies with Arts. 4 to 7 of the CRCF Regulation. The Applicant's core request is that the Commission reconsider whether the criteria set out in the DA are consistent with those standards. For the reasons set out more fully below, the Applicants consider that they are not.

21. The CRCF Regulation requires the EC to adopt delegated acts "*to supplement this Regulation by establishing certification methodologies*" (Art. 8(2), see further Art. 16 and Recital 27). Those certification methodologies constitute the assessment criteria that certification bodies should apply to determine whether a given activity provides a carbon removal or soil emission reduction (they are thus the terms on which the Commission endorses activities for investment purposes). Annex I to the CRCF Regulation lists 16 "*elements*" that the certification methodologies must include (identified as (a)-(p)) ("**the CRCF Annex I**"). Put simply, the Commission's Delegated Acts provide the further details of the steps needed to meet the requirements of the quality criteria in Art. 4-7 CRCF.

22. For permanent carbon removal activities, the criteria require, by way of elaboration:

    a. quantification, meaning the amount of the "*net removal benefit*" is calculable (Art. 4);

    b. additionality, meaning that the activity to be certified goes beyond the applicable statutory requirements and is additional to the standard practice, such that the incentive effect of certification is needed for the activity to be financially viable (Art. 5);

    c. storage, monitoring and liability, meaning that the removal must be sufficiently stable so that the activity stores carbon permanently or is aimed at storing it over the long-term (Art. 6); and

    d. sustainability, meaning that the activity "*does no significant harm*" to six environmental objectives and (in respect of permanent carbon removals) "*may*" generate a "*co-benefit*" to those objectives (Art. 7). The environmental objectives are listed in Art. 7(1)(a)-(f).

23. The relevant text of these provisions is set out as they relate to the Applicant's grounds below.

E. The Delegated Act

24. This RIR concerns the Delegated Act on permanent removals. Arts. 2-4 DA provide certification methodologies for direct air capture with carbon storage (DACCS), biogenic emissions capture with carbon storage (BioCCS) and biochar activities respectively. These give effect to formulae and rules set out in the Annex to the DA ("the DA Annex"). BioCCS is a process of combusting biomass (forest wood, industrial wood residues, or other biological material), capturing the resulting CO2 emissions, transporting the CO2, and compressing it and pumping it belowground for storage in certain geological formations (Recital 4 DA). Biochar is formed by partially combusting biomass to make a carbonaceous material that is applied to soils or incorporated into products (Recitals 2, 3 DA). DACCS captures CO2 from the atmosphere via chemical binding, then transports it and stores it via injection at appropriate geological storage sites. This RIR addresses BioCCS and biochar.

25. The DA provides various supplemental definitions in Art. 1 DA and in the 12 preliminary paragraphs of the DA Annex.

26. The specifics of the certification methodologies are provided in the four sections of the DA Annex. These deal with: (1) description of the activities that may be certified; (2) quantification of the emissions and removals related to the activities and the steps required to monitor these; (3) carbon storage; and (4) sustainability requirements.

F. Summary of the grounds for review

27. The Applicants ask the Commission to review the Delegated Act on the following grounds:

    a. Ground 1: unlawfulness in erroneously counting the storage of biogenic carbon as a removal of GHGs from the atmosphere, while also failing to account for emissions associated with changes in biogenic carbon stocks in the quantification.

    b. Ground 2: unlawfulness in including in the scope of the quantification methodology for BioCCS certification only those emissions that arise from additional biomass used specifically for the operation of the carbon capture process.

    c. Ground 3: unlawfulness in excluding methane emissions from storage from the quantification of an activity's associated GHG emissions when biomass is stored under certain conditions, in breach of Art. 4 CRCF.

    d. Ground 4: unlawfulness in failing to account for indirect land use change (ILUC) in the quantification certification methodologies in breach of Art. 4 CRCF.

e. Ground 5: unlawfulness in failing to set monitoring rules (or lawful monitoring rules) in respect of biochar activities in breach of Art. 6 CRCF.

f. Ground 6: unlawfulness in failing to adhere to the sustainability requirements in respect of biomass harvesting and use in breach of Art 7 CRCF.

G. Parameters and limits on the Commissioner's powers in making the DA

28. The Commission's powers in issuing the DA are constrained in five key respects.

29. First, the Commission's competence to adopt the DA is limited by Art. 290 of the Treaty on the Functioning of the EU ("**TFEU**"). This specifies that a delegated act may "*amend certain non-essential elements of the legislative act*" but it has to be consistent with and may not supplement or amend the "*essential elements*" of the basic legislation. The Courts have firmly established that matters that would necessitate "*political choices*" are beyond the Commission's competence when making delegated legislation; i.e. things that as a matter of democratic legitimacy must be decided by the legislature.[14]

30. Second, the terms of the DA must be based on correct interpretations of the CRCF Regulation and primary and other secondary EU law.

31. Third, the Commission must not make manifest errors of assessment or of fact.

32. Fourth, in setting the standards in the DA, the Commission is required to adopt a "*conservative*" approach (and to require through the DA that operators and certification bodies adopt a conservative approach). This is an important constraint on the Commission's freedom to act when making delegated legislation. The effect of this requirement is that the Commission must err in favour of environmental protection in the face of any doubt or uncertainty (per Recitals 18, 19, Art. 4(7) and Art. 4(12) CRCF, and CRCF Annex I para. (i)).[15] In practical terms, this means that where there is uncertainty in relation to whether a particular activity meets all the requirements of the CRCF Regulation, the Commission is obliged to not include that activity in any delegated act. Further, as set out below, the data relied on in relation to emissions and removals must not be over/understated.

33. Fifth, in setting the standards in the DA, the Commission is required to act according to "*best available scientific evidence*" and the "*latest available scientific evidence*" (Recitals 14, 27, and Art. 4(7), Art. 8(4)(c)).

[14] C-44/16 P *Dyson v Commission* EU:C:2017:357, C-355/10 *EP v Council: Schengen Borders Code* EU:C:2012:516, §77; C-696/15 P, Czech Republic, EU:C:2017:595, §86.
[15] This requirement is similar to, but not the same as, the precautionary principle set out in Art. 191(2) TFEU.

H. Grounds of review relating to Art. 4 CRCF: quantification

34. 'Carbon removal' is defined at Art. 2(1) CRCF as "*the anthropogenic removal of carbon from the atmosphere and its durable storage in geological, terrestrial or ocean reservoirs, or in long-lasting products*."

35. Art. 4 CRCF sets the "*quantification*" quality criteria that must be met before any activity may be certified as providing a permanent carbon removal under the Delegated Act. Art. 4(1) provides: "*A permanent carbon removal activity shall provide a permanent net carbon removal benefit*". An activity will deliver a "*permanent net carbon removal benefit*" if it removes more CO_2 from the atmosphere than would occur in a baseline scenario without the activity, taking into account emissions associated with the activity. This is explained in Recital 17, which provides: "*An activity delivers a net carbon removal benefit when the carbon removals above the baseline exceed any increase in greenhouse gas emissions associated with the implementation of that activity.*" Art. 4(1) CRCF requires that the net carbon removal benefit is to be quantified through the use of a specified formula:[16] "*permanent net carbon removal benefit* $= CR_{baseline} - CR_{total} - GHG_{associated} > 0$".

36. The remainder of Art. 4(1) provides a definition of $CR_{baseline}$, CR_{total} and $GHG_{associated}$. These draw upon the definitions in Art. 2 CRCF.

    a. $CR_{baseline}$ is the amount of carbon removals under the baseline (Art. 4(1)(b) CRCF). It reflects the amount of carbon removed in the ordinary course of events (i.e. without the activity that the CRCF system is intended to incentivise). The amount of carbon removals achieved by an activity is calculated against that baseline. The baseline can be either standardised or activity-specific.

    b. CR_{total} is the total "*amount of carbon removals*" for the activity (Art. 4(1)(a) CRCF).

    c. $GHG_{associated}$ is defined by Article 4(1)(c) as "*the increase in direct and indirect greenhouse gas emissions over the entire lifecycle of the activity which are attributable to its implementation, including indirect land use change*". Recital 15 CRCF confirms that relevant emissions include direct emissions from fuel or energy use and indirect emissions including from land use change.

37. In addition, the following general requirements apply:

[16] Art. 4(6) explains: "*Quantities referred to in paragraphs 1 to 5 shall be attributed a negative sign (–) if they are net greenhouse gas removals and a positive sign (+) if they are net greenhouse gas emissions; they shall be expressed in tonnes of* CO_2 *equivalent.*"

a. The quantification must be "*relevant, conservative, accurate, complete, consistent, transparent and comparable … in accordance with the latest available scientific evidence*" (emphasis added, Art. 4(7) CRCF). Recital 19 CRCF shows that conservative methodological choices are those "*in line with the 2006 IPCC Guidelines for National Greenhouse Gas Inventory estimates*" so that "*emissions are not underestimated and removals are not overestimated*" (emphasis added). Recital 9 further acknowledges that BioCCS and biochar activities "*can result in different types of net carbon removal benefits and durations of carbon storage, depending on the specific conditions under which the activities take place*".

b. Under Art. 8(3) CRCF, certification methodologies must, among other things, ensure the robustness and transparency of carbon removals (point (a)), promote the protection and restoration of biodiversity and ecosystems (point (b)), ensure the avoidance of "unsustainable" demand for biomass raw material (point (g)), ensure consistency with cascading principle under Article 3(3) Directive (EU) 2018/2001 (point (f)), and promote the sustainability of biomass in accordance with Directive (EU) 2018/2001 (point (e)).

c. The Commission must take into account the best available scientific evidence when preparing the certification methodologies (i.e. the matters to be included in the Delegated Act) (Art. 8(4)(c) CRCF).

38. A further structural principle follows from these provisions taken together, and in particular when read with Art. 4(1)(c) and Recitals 11, 13 and 15 CRCF. The CRCF Regulation anticipates the certification of activities at operator and facility level, in real time, on the basis of direct measurement. The CRCF Regulation's framework for assessing both removals and emissions is therefore activity-specific. As developed below, this principle has direct implications for how carbon emissions, storage, and removals must be assessed in the quantification methodology.

39. Within the DA Annex, §2.1 deals with the quantification of emissions and removals from BioCCS (i.e. it sets the certification methodology for the quantification criterion for BioCCS). §2.2 provides the corresponding methodology for biochar.

Ground 1: erroneously counting the storage of biogenic carbon as a removal of GHGs from the atmosphere, while also failing to account for emissions associated with changes in biogenic carbon stocks in the quantification

40. This Ground is concerned with the Commission's quantification of lifecycle emissions of BioCCS and biochar and how this affects the quantification of removals. It has three parts.

a. Part 1: the CRCF Regulation defines removal as removal of CO2 from the atmosphere. The Commission has accordingly erred in treating the terms "*carbon removal*" (Art. 2(1), atmospheric carbon only) and "*permanent carbon removal*" (Art 2(9), both atmospheric and biogenic carbon) as fully interchangeable in the CRCF Regulation without putting measures in place to ensure that all removal activities deliver actual removals.

b. Part 2: Storage of biogenic carbon does not constitute a removal because re-locating and storing biogenic carbon does not automatically sequester more CO2 from the atmosphere. The Commission has accordingly erred in proceeding on the basis that carbon removals from the atmosphere occur contemporaneously with biogenic carbon storage in relation to BioCCS and biochar. This is a manifest error of assessment by reference to the best and most up-to-date scientific evidence, and a failure to take a conservative approach.

c. Part 3: Counting storage of biogenic emissions as a removal without taking land sector emissions associated with biomass harvesting and use into account fails to reflect the full GHG impact of activities and permits certification of activities as providing "removals" when they do not in fact do so. The Commission has erred by not taking into account the best and most up-to-date scientific evidence on lifecycle accounting for biogenic carbon, and has disregarded guidance published by the UNFCCC and the IPCC.

Part 1 of Ground 1: concerning treatment of "carbon removal" and "permanent carbon removal" as interchangeable

Relevant background for Part 1 of Ground 1

41. Article 2(1) states that carbon removal is "anthropogenic removal of carbon from the atmosphere" and its durable storage. Article 2(9) defines "permanent" carbon removal as capture and storage of atmospheric or biogenic carbon for several centuries. These terms are not interchangeable, but the Commission treats them as such.

42. In respect of BioCCS, §2.1.3 DA Annex provides for the "*Quantification of the total removals of the activity*". These are the certification methodologies that the Commission has adopted to implement the requirement in Art. 4(1) CRCF to identify CR_{total}, namely the amount of carbon removed by the activity.

43. Under the heading "*Identification of captured CO_2 streams*" at §2.1.3.1, the DA Annex provides that: "*A capture facility may capture CO_2 that is: (a) solely atmospheric or biogenic CO_2; (b) a combination of biogenic CO_2 and fossil CO_2 from a mixed CO_2 stream.* At §2.1.3.2, the DA states the fraction of the captured CO2 that is of atmospheric or biogenic origin shall be counted towards the total carbon removal. In respect of biochar, §2.2.3 provides the "*Quantification of the total removals of the activity*" based on equation [44]. That equation accounts for two terms, C_{org} and $Q_{biochar}$, that refer to biogenic carbon, not atmospheric carbon:

    a. C_{org} is relevantly defined as: "*the organic carbon content of the biochar, C_{org}, which shall be established by laboratory analysis as the ratio of the mass of organic carbon in the biochar to the total mass of the biochar*"

    b. $Q_{biochar}$ is relevantly defined as: "*the mass of biochar applied or incorporated during the certification period, in tonnes on a dry matter basis. The mass of biochar shall exclude any fraction from non-biogenic material also processed in the biochar production process.*"

44. The DA thus treats captured atmospheric and biogenic CO_2 (subject to the biomass sourcing conditions of Directive (EU) (2018/2001) as equally capable of being stored and treated as a removal.

Unlawful inconsistency with the CRCF Regulation for Part 1 of Ground 1

45. First, the Delegated Act rests on an error of law. The CRCF Regulation defines a "carbon removal" as solely concerning atmospheric carbon: Art. 2(1) provides "'carbon removal' means the anthropogenic removal of carbon from the atmosphere and its durable storage …" (emphasis added). The Commission has made an error of law in applying the Article 2(9) definition in thereby seeking to expand that definition through the DA Annex in place of the Article 2(1) definition, thus including so as to include biogenic carbon within CRtotal, while failing to put measures in place to ensure that the biogenic carbon represents additionally sequestered atmospheric carbon.

46. Regarding the inclusion of both atmospheric and biogenic carbon in the definition of permanent removals, Art. 2(9) CRCF refers to the capture and storage of both atmospheric and biogenic CO2 as constituting permanent carbon removals. It is theoretically possible to process carbon from short-lived plants (such as energy crops) using BioCCS and biochar such that the storage of biogenic carbon, followed by immediate regrowth of the plant biomass that sequesters CO2 from the atmosphere, delivers a net removal of atmospheric carbon over a period of two or more years. Effecting this requires the use of short-lived feedstocks and execution of a full lifecycle

analysis that accounts for direct and indirect changes to land carbon stocks to determine whether there is a net removal. However, this approach would not yield a net removal of atmospheric CO2 in a period of a few years or even decades when the feedstock is derived from woody biomass from existing forests, because the forest regrowth that delivers the actual removal of CO2 from the atmosphere does not occur for years to decades to even more than a century. This problem was noted by consultants from ICF, appointed to advise the Commission prior to the CRCF Regulation:

> "*If […] wood is harvested from a stand of trees that was already in carbon equilibrium and was not planted for this purpose, then the removal of CO2 from the atmosphere is instead delivered progressively over the course of several years after the implementation of the project activity as trees are regrown on that site. In this case, the point of implementation of the BioCCS/biochar activity occurs before the net carbon removal benefit is realized*." (Emphasis added)

47. The possibility of a short-lived crop being used to capture atmospheric carbon does not, however, authorise the Commission to use a Delegated Act to treat the storage of biogenic carbon as though it automatically represents capture of atmospheric carbon. It is only where, taking full lifecycle emissions into account, the full biomass planting/harvest/CCS cycle delivers additional captured/stored atmospheric carbon above what would have occurred in the baseline that this could deliver a permanent carbon removal under Art. 2(9) in a manner that is not inconsistent with Art. 2(1). This is affirmed by a teleological interpretation; the purpose of the CRCF Regulation is the Atmospheric GHG Removal and Reduction Objective in order to meet the Paris Agreement's temperature targets. The immediately relevant carbon for this purpose is CO2 in the atmosphere, not carbon that was already stored in biogenic biomass.

48. This is also affirmed by an historical interpretation. The Legislature rejected the expansive definition of "carbon removal" in the Commission's proposal of 30 November 2022. This had included "the reduction of carbon release from a biogenic carbon pool to the atmosphere" as a form of removal (Art. 2(1)(a)). The Legislature chose to omit this part of the definition in Art. 2(1)(a) CRCF.

49. The Commission conditioned the types of biomass that can be used for biochar (even if that is not sufficient to ensure biochar redelivers a net removal, as discussed further below). The EC should have likewise conditioned the types of biomass that could be used with BioCCS to ensure it delivers actual removals. The Commission's failure represents a failure to apply the best available science and to heed the warning from the ICF consultants. This renders the DA not

able to carry out the central objective of the CRCF, which is to reduce the amount of CO2 in the atmosphere.

50. Second, and accordingly, the Commission has exceeded its competence. The Commission was not competent to treat atmospheric storage of atmospheric and biogenic carbon by way of the DA Annex as equivalent in delivering removals consistent with the goal of the CRCF.

Part 2 of Ground 1, regarding treatment of storage of biogenic carbon as if it automatically constitutes a removal

Relevant background for Part 2 of Ground 1

51. §2.1.3.2 of the DA counts a change in form and location of storage of biogenic carbon stocks as a removal of CO2 from the atmosphere (in the case of BioCCS, from plant material to a compressed gas that is injected underground, and in the case of biochar, from plant material to a carbonaceous material like charcoal that is then applied to soils or used in products). The problems with this are two-fold.

52. First, conceptually, as the IPCC Guidance explains for harvested wood products ("HWP"), re-location of carbon does not constitute a new removal from the atmosphere:

"*it may be noted that HWP do not directly sequester carbon from the atmosphere. However, carbon retained in HWP constitutes a pool of carbon that was sequestered originally by the above ground biomass carbon pool of forests and other wood producing land categories. In this respect, the carbon from CO2 originally sequestered by vegetation is transferred to the HWP pool.*"[17]

53. The UNFCCC itself made a similar point in its published guidance on how to calculate removals under Article 6.4 of the Paris Agreement:[18]

"23. … If a bioenergy with carbon capture and storage (BECCS) plant is powered by such biogenic waste, does it achieve removals? If the wood that was grown in country X over the last half century is pelletized and burned in a BECCS plant in country Y today, does that achieve removals?

[17] IPCC, 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (12 May 2019) page 12.7, at https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch12_HarvestedWoodProducts.pdf
[18] UNFCCC. A6.4-SB005-AA-A09 Information note: Removal activities under the Article 6.4 mechanism. Version 4. May, 2023. https://unfccc.int/sites/default/files/resource/a64-sb005-aa-a09.pdf

24. If we do not impose any temporal boundary on when the removals occurred, then the above BECCS activities would count as removal activities, because the CO2 injected into the geological storage facility was, over some period of time, removed from the open atmosphere by biological sinks. This creates a need for delineating a temporal boundary for removals to allow unambiguous attribution of removals to a particular removal activity."

54. Storing biogenic carbon belowground (in the case of BioCCS) or in soils and products (in the case of biochar) does not constitute a new removal from the atmosphere in circumstances where the carbon was already removed from the atmosphere by plant growth potentially decades or even centuries earlier (in the case of trees). A new (but not necessarily additional) removal of CO2 from the atmosphere does not occur unless and until plants or trees regrow. Treating previously sequestered carbon that has been stored in a new form as a new removal double-counts a removal that already occurred.

55. Second, treating storage of biogenic carbon as if it automatically constitutes a removal is inconsistent with the definition of "carbon removal" in Art. 2(1) CRCF as explained above. A removal refers to removal from the atmosphere. The Commission needed to condition the types of biomass that could be used to ensure that activities employing the broader Art. 2(9) definition (which includes both atmospheric and biogenic carbon) are capable of delivering actual removal of CO2 from the atmosphere.

Unlawful inconsistency with the CRCF Regulation for Part 2 of Ground 1

56. The DA Annex contains an error of law because it treats storage of biogenic carbon as instantaneously delivering a removal. Art. 4(1)(c) provides that the quantification criterion is required to account for the GHG emissions "over the entire lifecycle of the activity which are attributable to its implementation". By counting the storage of biogenic carbon as though it were instantaneously a removal of atmospheric carbon before any atmospheric carbon has been captured by regrowth of the biomass, the DA Annex unlawfully fails to account for the emissions from the "entire lifecycle" of the activity. This is also a manifest error of assessment by reference to the best and most up-to-date scientific evidence, and a failure to take a conservative approach.

Part 3 of Ground 1: failing to appropriately account for impacts on land carbon in the quantification for BioCCS and biochar certification

Relevant Background for Part 3 of Ground 1

57. The quantification formula for a permanent net carbon removal benefit at Art. 4.1 of the Regulation is developed the DA Annex, which includes descriptions of how to calculate $CR_{baseline}$

(at §2.1.2. for BioCCS and §2.2.2. for biochar) and $CR_{associated}$ (starting at §2.1.8.4. for BioCCS and §2.2.4. for biochar). However, the formulae in the DA Annex for calculating these terms are incomplete because they do not account for carbon emissions in the land sector that are associated with changes in biogenic carbon stocks that arise from harvesting biomass for BioCCS and biochar activities ((these should have been accounted for in the formulae for calculating $CR_{baseline}$ or $CR_{associated}$). In the EU's overall balance sheet of carbon stocks, moving carbon from one column (the land sector) to another column (storage via BioCCS or biochar) does not necessarily increase uptake of atmospheric CO2 by the land sector over what would have occurred in the absence of the activity.

58. The quantification formulae also ignore the issue of forgone sequestration, meaning the carbon that would have been removed from the atmosphere by forests or other land had they or it not been harvested to provide biomass for BioCCS and BCR activities. Harvesting forests for products and fuel reduces forest carbon stocks and the net sink. As the EC explains, drawing on a modelling study by the JRC, "*until 2050, the potential additional benefits from harvested wood products and material substitution are unlikely to compensate for the reduction of the net forest sink associated with the increased harvesting*."[19] Other studies make clear that reforestation of agricultural land will typically sequester many times more carbon from the atmosphere per hectare (both above and below ground) than could be saved in emissions by using the same area of land for biofuel production. The same will often be true of letting land revert to forest or other vegetation through natural succession.[20] Forgone sequestration can be very significant and should not be omitted from the quantification of the net carbon benefit. The calculation of CRbaseline would be an appropriate place to account for forgone sequestration.

59. The DA disregards impacts in the land sector when assessing the permanent carbon removal of an activity. The failure to account for land sector emissions is particularly acute in the treatment of biomass as having zero CO2 emissions. Under §2.3.4.3, biogenic carbon is counted as zero in GHGassociated for both BioCCS and biochar: "When biomass, biofuel, bioliquid or biomass

[19] See Questions and Answers: European Green Deal: new EU Forest Strategy for 2030 (https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3548) and JRC Publications - Brief on the role of the forest-based bioeconomy in mitigating climate change through carbon storage and material substitution (https://publications.jrc.ec.europa.eu/repository/handle/JRC124374)

[20] Fehrenbach et al., (2023) *The Carbon and Food Opportunity Costs of Biofuels in the EU27 plus the UKI. Available at:* ifeu_study_COC_biofuels_EU_for_TE_2023-03-02_clean.pdf
Righelato & Spracklen (2007)*Carbon mitigation by biofuels or by saving and restoring forests*. Available at: https://user.iiasa.ac.at/~gruebler/Lectures/skku_2009/readings/righelato_biofuels_afforestation_comp_science2007.pdf; Evans et al., (2015) *Greenhouse Gas Mitigation on Marginal Land: A Quantitative Review of the Relative Benefits of Forest Recovery versus Biofuel Production.* Available at: https://pubs.acs.org/doi/pdf/10.1021/es502374f. Note that in the latter paper the high rates for miscanthus are unlikely to be realistic as they assume yields roughly three times higher than those achieved in the field (e.g. see Searle and Malins (2014) *Will energy crop yields meet expectations?*. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0961953414000026).

fuel meeting the sustainability requirements set out in Article 29 of Directive (EU) 2018/2001 is consumed for an activity …, any CO2 produced by chemical processes from the carbon atoms therein contained shall be accounted for with a CO2 emission factor equal to zero". In respect of BioCCS, §2.1.6.3 DA Annex further states: "… applying a CO2 emission factor of zero to biomass combustion".

60. The IPCC Guidelines for emissions reporting employ the biogenic CO2 zero-rating convention in the energy sector to prevent double-counting across the energy and land sectors, not as a scientific finding that biomass harvesting and use has no climate effect.[21] As the IPCC 2006 Guidance makes clear, the calculation of "negative" emissions in the energy sector depends on this convention of counting biomass as having zero emissions in the energy sector. Equation 2.7 of the chapter on stationary combustion calculates net emissions from power plants using CCS to store carbon as production (estimated emissions, which for biomass are counted as zero in the energy sector) minus the amount of CO_2 captured.[22] Where biomass CO_2 capture occurs, the emissions from the process will be "negative" in the energy sector. However, this does not mean there has been removal of CO_2 from the atmosphere, because the (positive) emissions from loss of biomass carbon counted in the land sector may offset "negative" emissions in the energy sector. With regard to bioenergy, the IPCC estimate for energy sector emissions should not be reported alone; it must be summed with emissions from bioenergy in the land sector to produce a valid estimate of bioenergy emissions overall.

61. Treating biomass as having zero emissions in the energy sector would not be a problem if the full land sector impacts of biomass harvesting and use were taken into account somewhere else in the quantification methodology. However, land sector impacts of biomass harvesting and use attributable to the BioCCS plant's biomass consumption are simply *not* reflected – neither in the baseline (which is zero)[23] nor in $GHG_{associated}$, nor in CR_{total} (which counts captured CO_2 as a benefit, but excludes the disbenefit of removing carbon from the land sector).

62. It is relevant to note that in the equations that determine net removals from carbon farming activities (Art. 4(2)-(5) CRCF), the Commission does take into account biogenic carbon pool dynamics that exist prior to the implementation of the activity. For example, in Art. 4(4) the biogenic carbon pools referred to are (a) above-ground biomass; (b) below-ground biomass; (c) litter; (d) dead wood; (e) soil organic carbon; (f) harvested wood products in the land accounting

[21] 2006 IPCC Guidelines for National Greenhouse Gas Inventories, vol. 2, ch. 2, Section 2.3.3.4.
[22] Page 2.36 at https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf
[23] See DA Annex, §§2.1.2 and 2.2.2.

categories of afforested land and managed forest land.[24] For carbon farming, the DA thus recognizes that activities may impact existing land carbon stocks and sinks.

63. The Commission choose not to acknowledge those same potential impacts from harvesting biomass. This is surprising in circumstances where the Commission has itself acknowledged the importance of taking full land sector lifecycle emissions into account. UNFCCC final guidance for calculating removal activities under Art. 6.4 Paris Agreement defines leakage as "anthropogenic emissions by sources of GHGs that occur outside the activity boundary which are attributable to the Article 6.4 activity."[25] This would include loss of land sector carbon from biomass harvesting. The Commission's response to the consultation supported a highly conservative approach recommending taking upstream and downstream impacts into account:

> "*The EU believes that all potential sources of leakage should be considered, including, inter alia, upstream and downstream emissions, activity-shifting, rebound effects or ecological leakage (mitigation activities that affect other areas that are hydrologically connected). Similarly, we believe that the consideration of leakage should not be geographically confined.*"[26]

Unlawful inconsistency with the CRCF Regulation for Part 3 of Ground 1

64. The failure to account for impacts on land sector carbon dynamics when assessing the benefits of BioCCS and biochar is inconsistent with the requirements of the CRCF Regulation in five respects.

65. First, it proceeds on an error of law. The CRCF Regulation does not provide for zero-rating of any GHG emissions. The definition of $GHG_{associated}$ in Art. 4(1)(c) requires that all GHG emissions be accounted for. This necessarily covers land sector emissions.

66. This is also evident from Recitals 15 and 17.

67. Second, the three terms of the formula in Art. 4(1) – $CR_{baseline}$, CR_{total} and $GHG_{associated}$ – must together produce a figure that represents, accurately and completely, the net impact of the certified activity on atmospheric GHG concentrations. This is an essential element of Art. 4(1) which provides the central definition upon which the entire CRCF Regulation relies. Without

[24] Annex I of Regulation (EU) 2018/841 (LULUCF Regulation). At https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0841

[25] UNFCCC. A6.4-STAN-METH-001. Standard: Application of the requirements of Chapter V.B (Methodologies) for the development and assessment of Article 6.4 mechanism methodologies. Version 01.1. https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-001.pdf

[26] UNFCCC. A6.4-SB007-AA-A13 Information note : Compilation of the public input on removal activities under the Article 6.4 mechanism. Version 02.1. page 81 at https://unfccc.int/sites/default/files/resource/a64-sb007-aa-a13.pdf

accurate accounting of the land sector emissions associated with biomass harvesting and use, there is no way to ascertain if the goals of the CRCF Regulation are being met. The Commission was therefore not competent to amend or supplement this essential element of the CRCF Regulation by deciding to exclude land sector carbon emissions.

68. Third, the disregard for land sector impacts (which effectively translates to a blanket zero-rating for biomass carbon emissions in the land sector) is inconsistent with the requirements under Arts. 4(7) and 8(4)(c) CRCF that the methodology reflect the "*latest*" and "*best available scientific evidence*" and that quantification be accurate and complete:

    a. It fails to acknowledge that forest harvesting reduces above-ground and below-ground carbon stocks and causes soil disturbance that can lead to loss of soil carbon.[27] Biomass harvesting appears to particularly deplete soil carbon and nutrient stocks, potentially impacting forest regeneration.28 The Commission itself acknowledged in its own Impact Assessment on the Sustainability of Bioenergy that climate impacts of forest biomass burned for energy in unabated (no CCS) power plants may be higher than fossil fuels when considering biogenic emissions, and that there was an "*agreement in the scientific community*" that "*biogenic CO2 emissions … need to be taken into account, and can have a critical role in the overall climate performance*".[29] Further, the Commission's own Joint Research Centre ("**JRC**") confirmed in 2021 that harvesting "coarse woody debris" and stemwood – which constitute a large proportion of biomass burned in the EU – for energy has net emissions exceeding those of fossil fuels for decades to more than a century.[30] Zero-rating ignores those physical and temporal realities.

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[27] Hamburg, S. P., *et al.*, *Losses of mineral soil carbon largely offset biomass accumulation 15 years after whole-tree harvest in a northern hardwood forest* (2019) Biogeochemistry 144(1), pages 1-14. At https://doi.org/10.1007/s10533-019-00568-3;
Mayer, M., *et al. Tamm Review: Influence of forest management activities on soil organic carbon stocks: A knowledge synthesis* (2020) Forest Ecology and Management 466, 118127. At https://www.sciencedirect.com/science/article/pii/S0378112720300268.
28 Achat, D. L., et al., Quantifying consequences of removing harvesting residues on forest soils and tree growth – A meta-analysis (2015) Forest Ecology and Management 348(Supplement C), pages 124-141. At http://www.sciencedirect.com/science/article/pii/S0378112715001814
Achat, D. L., et al., Forest soil carbon is threatened by intensive biomass harvesting (2015) Scientific Reports 5, 15991. At https://doi.org/10.1038/srep15991
[29] Impact Assessment on Sustainability of Bioenergy, Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (recast) of 30 November 2016 (2016 Directive (EU) 2018/2001): pp. 14-16, 36, 60 and 103-106
[30] JRC, *The use of woody biomass for energy production in the EU* (2021), page 146 (Figure 42);
Agostini et al, *Carbon accounting of forest bioenergy*, JRC Technical Reports, (2013), page 16: https://www.researchgate.net/publication/235704189_Carbon_accounting_of_forest_bioenergy_Conclusions_and_recommendations_from_a_critical_literature_review

b. Failing to count land sector impacts is also inconsistent with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories – with which the DA must be aligned under Recital 19 CRCF. As explained above, the Guidelines count biomass harvesting and use as zero in the energy sector solely to prevent double-counting across the energy and land sectors. The IPCC has expressly clarified that the Guidelines do not assume biomass used for energy as "carbon neutral", even in cases where the biomass is thought to be produced "sustainably".[31]

c. The failure to acknowledge land sector impacts under the DA likewise falls short of the standard set by the UNFCCC in its Requirements for activities involving removals under Art. 6(4) of the Paris Agreement. Removals under Art. 6.4 may be traded among countries and countries can count them toward their NDC achievement.[32] Art. 6.4 requires the baseline and activity scenarios for carbon removal projects to fully reflect the net change in GHG storage and emissions in the land sector.[33] Under Art. 1(2) CRCF, removal units are expressly intended to contribute to the Union's NDC and its climate-neutrality objective, and as stated above, the CRCF must be interpreted and implemented consistently with those objectives. This precludes any reading of Art. 4 CRCF that significantly differs from the UNFCCC's approach to calculating net removals under Art. 6(4) of the Paris Agreement. This conclusion is reinforced by Recital 42 and Art. 18(4) CRCF, which envisages future legislative action to introduce "*additional requirements*" to ensure alignment with evolving UNFCCC guidance on Art. 6(4) and "*methodological requirements*". That language presupposes alignment between the CRCF and UNFCCC standards, and that the Commission may not depart from those. In any event, insofar as those UNFCCC formulas embody the "*latest available scientific evidence*" and fully account for land sector carbon pools recognised under IPCC Guidance, departing from them contravenes Art. 4(7) CRCF. Any methodologies departing from UNFCCC standards risk certifying units that overstate actual atmospheric benefit, thereby also falling foul of the requirements for accuracy, environmental integrity and the avoidance of double counting "*in accordance with guidance adopted by the Conference of Parties*" under Art. 4(13) Paris Agreement,

[31] IPCC, Taskforce on Greenhouse Gas Inventories, FAQ Q2-10, https://www.ipcc-nggip.iges.or.jp/faq/faq.html
[32] Öko-Institut, *Does the CRCF methodology for permanent removals align with the PACM?* (October 2025) pp. 10-15. At https://www.oeko.de/fileadmin/oekodoc/PB-EU-CRCF-and-Article-6.4.pdf
[33] UNFCCC, Standard: Requirements for activities involving removals under the Article 6.4 mechanism, A6.4-SBM014-A06, pp. 7-8; UNFCCC, Standard Method: Requirements for activities involving removals under the Article 6.4 mechanism, A6.4-STAN-METH-002, §§30(a)-(d);
Öko-Institut, *Does the CRCF methodology for permanent removals align with the PACM?* (October 2025) pp. 10-15. At https://www.oeko.de/fileadmin/oekodoc/PB-EU-CRCF-and-Article-6.4.pdf.

which is mandatory for the Union, and opening them up to scrutiny under the enhanced transparency framework in Art. 13 of that agreement.

d. A variety of scientific evidence, including the Commission's own 2016 Impact Assessment on Sustainability of Bioenergy, confirms that the temporal aspect of carbon impact of biomass use varies materially depending on feedstock type in particular.[34] The DA itself recognises that the biomass used for BioCCS and biochar activities can involve reduction in natural carbon stocks (e.g. forests) and that regeneration is required in addition to storage §4.3.3 of the DA Annex provides that operators "*may purchase carbon farming sequestration units*" to "*support the regeneration of natural carbon stocks used for the generation of permanent carbon removals*". As the Commission is acknowledging in the DA that the process of regeneration of natural carbon stock is not immediate, that is inconsistent with the DA's convention of counting a "removal" as having occurred at the moment of storage of carbon. By applying a uniform zero CO_2 emission factor to all eligible biomass regardless of those conditions, the Commission fails to distinguish between feedstocks whose counterfactual involves rapid decomposition (e.g. agricultural residues) and feedstocks like forest biomass whose counterfactual involves ongoing sequestration, durable alternative uses, or displacement of other biomass users.

69. Fourth, §2.3.4.3 of the DA Annex incorrectly assumes that compliance with Art. 29 Directive (EU) 2018/2001 allows treating biomass use as having zero biogenic CO_2 emissions. Such reliance on Art. 29 Directive (EU) 2018/2001 is misplaced:

a. This provision constitutes the "*biomass sustainability*" requirements adopted at §4.3.1 of the DA Annex pursuant Art. 8(3)(e) CRCF. By relying on those requirements, along with LULUCF accounting (see further below), as the basis for its conclusion that biogenic CO_2 can be counted as zero, the Commission conflated the minimum requirements to ensure no significant harm to the environment (Arts. 7(1) and 7(3)(c))

[34] Impact Assessment on Sustainability of Bioenergy, Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (recast) of 30 November 2026 (2016 Directive (EU) 2018/2001):, pp. 103-107, describing the findings of: JRC, *Carbon accounting of forest bioenergy* (2014);
Forest research, *Review of literature on biogenic carbon and life cycle assessment of forest bioenergy* (2014), which found that biogenic emissions remain "*higher than emissions from fossil fuels beyond a policy-relevant timeframe for sawnwood, stumps, coarse dead wood*";.
JRC, *The use of woody biomass for energy purposes in the EU* (2021), pp. 8, 10, 84 and 86 (fn 31); ESABCC, *Scaling-up carbon dioxide removals: recommendations for navigating opportunities and risks in the sector* (2025), p. 61. At https://climate-advisory-board.europa.eu/reports-and-publications/scaling-up-carbon-dioxide-removals-recommendations-for-navigating-opportunities-and-risks-in-the-eu.

and biomass sustainability (Art. 8(3)) and the more demanding requirement under Art. 4 that the quantification methodology accounts for all emissions "*over the entire lifecycle of the activity*" and guarantees that the certified activities deliver net removals – i.e. an actual contribution to climate change mitigation.[35]

b. Art. 29 Directive (EU) 2018/2001 establishes minimum harvesting standards for bioenergy, states that carbon loss from biomass harvesting is to be accounted in the land sector, and imposes minimum GHG savings thresholds relative to fossil fuels for certain energy applications. It was not designed to, and does not, determine the carbon emissions impact of bioenergy in a way appropriate to certify whether carbon removals have actually occurred.

c. The harvesting provisions of Art. 29(6) address forest management practices and legality of harvesting. They do not prevent forest carbon stocks from declining as a result of CRCF activities. The Commission itself had recognised in the 2016 Directive (EU) 2018/2001 impact assessment that "*sustainable forest management practices … cannot guarantee that an increase in forest biomass for energy will deliver greenhouse gas savings*".[36]

d. As stated above, climate impacts of biomass use for energy – and thus, removals too – depend primarily on the feedstock being used, not how sustainably a forest (or agricultural land) is managed.[37] Yet neither the DA nor the Directive (EU) 2018/2001 criteria contain any mechanism (e.g. feedstock-differentiated emission factors or feedstock exclusions) to capture those variable carbon outcomes,[38] contrary to the requirement under Art. 8(3) that the methodology "*shall … further differentiate between the activities on the basis of their characteristics*", as well as Arts. 4(7) and 8(4)(c) CRCF.

e. Fifth, to the extent that the zero-rating of biomass CO2 rests on the assumption that biogenic emissions attributable to biomass harvesting for BioCCS and biochar activities

[35] See also in this respect: ESABCC, *Scaling-up carbon dioxide removals: recommendations for navigating opportunities and risks in the sector* (2025), p. 152, noting that the CRCF goes beyond Directive (EU) 2018/2001: "*The CRCF regulation … does not only require the RED II compliance, but also goes beyond it through clauses on doing no significant harm, sustainability co-benefits, and entire value chain emissions of removal projects*".
[36] 2016 Directive (EU) 2018/2001 impact assessment, p. 17
[37] 2016 Directive (EU) 2018/2001 impact assessment, p. 106, finding that biogenic emissions remain "*higher than emissions from fossil fuels beyond a policy-relevant timeframe for sawnwood, stumps, coarse dead wood*"
[38] While the DA (§4.3.2) does set feedstock restrictions for BCR activities, those restrictions do not seek to ensure that all eligible feedstocks would otherwise have rapidly decomposed, and do not apply where biochar is not the primary output - meaning saw logs, veneer logs, industrial grade roundwood and other primary biomass categories may then be eligible (see further below Ground 6, Limb 1)

are adequately accounted for through the accounting framework provided by the LULUCF Regulation, that assumption cannot be sustained and constitutes a manifest error of assessment and/or a further failure to account for the "*latest*" and "*best scientific evidence*", contrary to Arts. 4(7) and 8(4)(c) CRCF.[39]

70. In the first place, any reliance on land sector accounting at the national level is incompatible with the CRCF's activity-specific quantification framework, and unverified at operator level:

a. The CRCF is an activity-level instrument. Recitals 11, 13 and 15 of the Regulation confirm that carbon accounting under the CRCF is performed at the level of the individual activity. CR_{total} is supposed to be assessed at operator level through direct facility-level measurement: equations [1], [2], [7] and [8] record, for the specific certified facility, the specific tonnes of CO_2 entering storage in the certification period. These project-level removal generating certified units may be used by private operators.[40]

b. The zero-rating convention, by contrast, serves the (sole) purpose of preventing double-counting in national GHG inventories where emissions are reported for both the land sector and energy sector, as the IPCC has made clear. Importing it into the CRCF's assessment of substantial contribution is an improper application of a reporting convention intended to apply solely in all-sector national-level reporting where the emission will be included in the land sector.

c. The CRCF and the national inventory follow different accounting logics, attributional versus consequential.[41] Attributional accounting limits convergence and does not ensure visibility of removal units certified under the CRCF in the national GHG inventory. Importing the LULUCF zero-rating convention into the CRCF carbon removal formula therefore does not serve its intended purpose of preventing double-counting – it simply removes biogenic emissions from the project-level accounting. These emissions occur and should be acknowledged. Properly accounting for those emissions within the CRCF formula would create no double-counting risk. Achieving

[39] Regulation (EU) 2018/841 (LULUCF Regulation)
[40] CRCF, recital 42 and Article 12(2)
[41] National GHG inventories use *attributional* accounting (i.e. recording what emissions occurred within a territory) whereas carbon crediting mechanisms like the CRCF use *consequential* accounting, asking what net change a specific project caused relative to a baseline. A zero-rating convention justified in the former context does not carry over to the latter, where the question is whether the activity produces a net atmospheric benefit. See CDR, *The state of carbon dioxide removal*, 2026, p. 22, at https://www.stateofcdr.org/report/3rd-edition

the LULUCF target of a land-based carbon sink of 310 Mt CO_2eq by 2030 requires that incentives for private operators reflect the actual impacts of their activities on this sink.

d. The Commission's approach in the DA stands in contrast to established practice in carbon crediting mechanisms, where the emissions impact of biomass use in a certified project is commonly fully accounted for – for example by treating losses of carbon stocks resulting from the project as project-level emissions, regardless of how those flows are treated in national inventories.[42] The UNFCCC's Art. 6(4) Paris Agreement Crediting Mechanism (PACM) reflects this approach explicitly: under its Removal Standard, the formula for calculating removals takes into account changes in GHG storage across relevant reservoirs, all leakage effects, and any crediting deficit carried forward from prior periods. No Art. 6(4) emission reduction units may be issued for a monitoring period in which net removals are negative.[43]

71. In the second place, the above assumption reflects an internal incoherence in the DA. The zero-rating convention under §2.3.4.3 rests on the premise that biogenic CO_2 from biomass harvesting and use is not an atmospheric emission in the energy sector because it is assumed to be already recorded in the land sector at the time of harvest. Yet the removal claim under CR_{total} treats the capture and storage of that same CO_2 as an atmospheric removal.

72. Finally, research has documented that EU forest biomass harvesting for energy purposes is contributing to the decline of the carbon sink in Member States and the EU as a whole, even where biomass harvesting is reported in the LULUCF Regulation.[44] The premise that the LULUCF criteria in Directive (EU) 2018/2001 and the LULUCF Regulation are sufficient to even ensure maintenance of the forest carbon sink is therefore empirically contested by evidence that was available to the Commission at the time of adoption of the DA.[45]

73. In this context, the certification methodology under the DA fails to measure the net atmospheric effect of the certified activity within the meaning of Art. 4(1) CRCF, and to fulfil Art. 4(7)'s requirements of completeness, conservativeness and latest available science. It rests on clear errors of law, by interpreting those provisions as allowing certification of activities as removals when they may in fact result in net GHG emissions. This materially defeats the CRCF's purpose

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[42] Öko-Institut, *Does the CRCF methodology for permanent removals align with the PACM?* (October 2025). At https://www.oeko.de/fileadmin/oekodoc/PB-EU-CRCF-and-Article-6.4.pdf, pp. 10 and 15

[43] UNFCCC, Standard Method: Requirements for activities involving removals under the Article 6.4 mechanism, A6.4-STAN-METH-002, §§30(a)-(d)

[44] Migliavacca, Grassi, et al., Securing the forest carbon sink for the European Union's climate ambition, Nature (2025) p. 1204. Nature, Vol 643, 31 July 2025. https://www.nature.com/articles/s41586-025-08967-3

[45] Booth M and Giuntoli J, *Burning Up the Carbon Sink: How the EU's Forest Biomass Policy Undermines Climate Mitigation* (19 April 2025), see Figure 1, page 2. Available at: https://doi.org/10.1111/gcbb.70035

in Art. 2(1) and fails to ensure the CRCF is interpreted and applied in a manner consistent with the ECL and the Paris Agreement. Accordingly, the DA should be review on this ground.

74. To the extent the Commission may consider that, regarding changes in forest carbon stocks, the sustainability criteria in Articles 29(6) and 29(7) of Directive (EU) 2018/2001 ensure future sequestration of carbon by forests (such that atmospheric CO_2 will ultimately be captured in the future, with the effect of mitigating climate change), it made a manifest error of assessment and failed to act either conservatively or according to the latest and best available scientific evidence. This is because the DA treats removals as if they occur simultaneously with carbon storage whereas the physical reality is that any possible regrowth and carbon sequestration will only occur in the future. The quote above from the ICF consultants acknowledging the time lag between the project activity and actual removal of CO2 from the atmosphere is again relevant.

75. The DA Annex disregards this and wrongly considers that removals occur instantaneously when the carbon is stored either with CCS or as biochar.

Ground 2: including in the scope of the quantification methodology for BioCCS certification only those emissions that arise from additional biomass used specifically for the operation of the carbon capture process

76. Ground 2 challenges the exclusion from the BioCCS quantification of all biomass GHG emissions arising from the broader bioenergy operation. At the core Ground 2 is the representation that the Commission has erred in accounting only for the GHG emissions from additional biomass needed to run the CCS component of a BioCCS facility and excluding the emissions associated with the integrated bioenergy operation. This is contrary to a number of provisions within the CRCF Regulation, most notably the obligation to take account of the entire lifecycle of the activity and the definition of "activity". It is also contrary to common sense.

77. For BioCCS, the DA Annex provides that only additional biomass used specifically for the operation of the carbon capture process falls within the scope of quantification.[46] GHG emissions resulting from the burning of biomass for normal operation are expressly excluded from $GHG_{associated}$.

[46] This does not apply to biochar activities, as all biomass consumed by the biochar activity – whether as feedstock for pyrolysis or as energy input to the process – is consumed for the certified activity under the DA.

78. This exclusion is given effect through a series of provisions:

    a. Under §2.1.4, equation [9] provides that $GHG_{capture}$ – a component of $GHG_{associated}$ – are emissions associated with the capture facility,[47] calculated pursuant to §2.1.6.3 where the CO_2 captured is biogenic.

    b. §2.1.6.3 states that $GHG_{capture}$ covers "*only the emissions specifically associated with operating the capture process*". It further provides that emissions "*associated with the normal operation of the facility generating the biogenic CO2, that do not result from the operation of the capture process, shall not be included*".

    c. Table 1 confirms this exclusion. Under the "CO_2 capture" phrase, the "Biomass supply" row is limited to "*Emissions associated with additional biomass, biofuels, bioliquids and biomass fuels consumed for the operation of the capture facility*".[48] This excludes the biomass stream that is combusted to generate the biogenic CO2 being captured.

    d. In §2.1.6.3.1, equation [17] defines $GHG_{capture}$ as a function of $GHG_{facility}$ and GHG_{inputs}. $GHG_{facility}$ is in turn defined by equation [18]. These terms cover only emissions associated with the operation of the capture equipment itself, ancillary biomass consumption "*for the operation of the capture facility*", and supporting infrastructure.

79. Likewise, the standardised baseline under §2.1.2 of the DA Annex, which is set at zero tCO_2/year for BioCCS activities, is understood as reflecting a situation *ex ante* in which no capture process using CCS was standardly in place. It does not represent the net GHG emissions of the host facility before CCS was implemented, or the amount of removals in the land sector absent the bioenergy operation (a figure of concern because forests and other lands harvested for biomass could potentially sequester and store more carbon from the atmosphere than they do when they are harvested for biomass fuel).

80. Thus, GHG emissions (including biogenic CO_2 emissions) linked to the original bioenergy generation process are excluded from the outset from every aspect of the quantification.

Unlawful inconsistency with the CRCF Regulation for Ground 2

81. The Commission misconstrued Art. 4(1)(c) CRCF as concerning exclusively emissions from the operation of CCS, thereby permitting or requiring the exclusion from the quantification of

[47] GHGtransport and GHGstorage are "*emissions associated with CO2 transport from the capture facility to the storage sites*" and "*emissions associated with the storage sites*".
[48] See also, Section 2.3.3 of the Annex, defining "*additional biomass consumption*" as the "*biomass, biofuel, bioliquid and biomass fuel that is consumed specifically to provide energy for a carbon capture process*"

biomass GHG emissions produced by the bioenergy generation process. This approach is inconsistent with the CRCF Regulation.

82. First, Art. 4(1)(c) defines $GHG_{associated}$ as the increase of GHG emissions "*over the entire lifecycle of the activity which are attributable to its implementation*". In environmental law and carbon accounting, a lifecycle assessment that begins at the point where CO_2 enters the capture system, and excludes the material that generates the bulk of the CO_2 being captured, is not a lifecycle assessment in any conventional sense. The word "*entire*" precludes a reading that excludes the upstream stage on which the capture process is dependent. The equation at Article 4(1) supports this interpretation. Art. 4(1) states a "*permanent carbon removal activity shall provide a permanent net carbon removal benefit*", which is quantified using an equation that includes the term for total carbon removal, CR_{total}. Section 2.1.3.2. of the DA explains that captured atmospheric or biogenic carbon is counted toward the total carbon removal. The process of quantifying removals by necessity must concern the mass of CO2 actually stored and counted as a removal.

83. Second, the Commission's approach to Art. 4(1)(c) DA is based on a narrow definition of the certified BioCCS activity by reference to the carbon capture and storage process (see e.g. §1.1.1 DA Annex), not to the integrated bioenergy operation. That reading contradicts Art. 2(3) CRCF which defines the "*activity*":

    a. This provision defines "*activity*" as "*one or more practices or processes carried out by an operator … resulting in a permanent carbon removal*". The activity is defined by reference to its outcome – a carbon removal.

    b. Art. 2(1) defines "*carbon removal*" as "*the anthropogenic removal of carbon from the atmosphere and its durable storage*". The atmosphere is a globally integrated pool of gases. The reference to "*removal from the atmosphere*" thus implies a process that reduces the concentration of CO_2 in the atmosphere as a whole. Recital 11 adds that carbon removals "*should be generated only by activities that generate a net carbon removal benefit*". That assessment cannot be performed on the capture process alone; it depends on the full carbon cycle of the biomass used and the full range of impacts that the activity has on the atmosphere, including activities that may affect emissions in the land sector.

    c. Further, if it were simply the carbon capture process alone that determined "*removal*," then CCS applied to fossil fuel combustion could equally be calculated as a "*removal*," which it clearly is not. The CRCF indeed excludes fossil CCS from its scope (Art. 1(3)),

reflecting that capture alone does not suffice: what matters is whether carbon is removed *from the atmosphere*, which requires assessment of the full carbon cycle upstream and downstream of the capture and storage process. As explained above at Limb 2 of Ground 1, simply storing biogenic carbon does not effect its removal from the atmosphere.

d. The net atmospheric effect of the integrated BioCCS operation – taking account of both emissions and removals – is therefore what determines whether the Art. 2(1) condition is satisfied, which in turns defines the certified activity under Art. 2(3). This must be reflected in the quantification.

84. Third, Recital 17 expressly provides that "*the amount of permanently stored carbon should exceed the energy-related greenhouse gas emissions from the industrial process*". The phrase "*the industrial process*" refers to the production process of the bioenergy plant in which the combustion occurs – not to the capture equipment alone, which is not an "*industrial process*" in any usual sense. Recital 17 thus reflects the Legislature's intention that the quantification take into account all of the host facility's energy-related emissions, not only the ancillary emissions of the capture equipment.

85. Finally, the CRCF Regulation's Atmospheric GHG Removal and Reduction Objective, in order to achieve the Union's commitment to climate-neutrality, supports the above reading. The CRCF, as an instrument expressly adopted to serve that objective, must be interpreted and implemented in a manner consistent with the ECL and the Paris Agreement.[49] Climate neutrality requires net atmospheric GHG reduction. That precludes a reading of Arts. 2(1), 2(3) and 4(1) that allows for a certification methodology that produces certified "*removals*" without ensuring net atmospheric reduction is taking place following the full life-cycle assessment across the integrated bioenergy operation, in line with the best available science and conservativeness.

86. The following elements of the DA are therefore inconsistent with Arts. 2(3) and 4(1) as properly construed: (i) §2.3.3's and Table 1's "additional" qualifier for biomass supply and the limitation to use "for the operation of the capture facility"; (ii) §2.1.6.3's exclusion of "normal operation" emissions; (iii) the equations operating those exclusions ([17], [18], [19] and [21]); and (iv) in the alternative, §2.1.2's zero baseline. The DA should be reviewed accordingly.

[49] See e.g. Judgment of 10 September, *Austria v Commission*, T-625/22, EU:T:2025:869, §187

87. Further, on this proper construction of the full net atmospheric assessment as that of the integrated BioCCS operation, the arguments in Part 3 of Ground 1 above apply to all biogenic emissions from such integrated operation.

Ground 3: excluding methane emissions from the quantification of an activity's associated GHG emissions when biomass is stored under certain conditions, in breach of Art. 4 CRCF

Relevant Background

88. Methane is a potent GHG. Over a 100 year period, the IPCC reports that methane has 27 times the global warming potential of CO_2 ("**GWP**"), and over a medium term timescale of 20 years (i.e. in the period before 2050 by which the EU has committed to carbon neutrality), methane has 79.7 times the GWP of CO_2.[50] The Commission's own statistics state even higher GWP for methane, at 29.88 times the GWP of CO_2 over 100 years and 82.5 times over 20 years.[51]

89. GHG emission results are extremely sensitive to emissions of methane from the wood chip piles: If 1 % of the carbon within the stack undergoes anaerobic decomposition to methane, then non-biogenic GHG emissions can triple.52

90. Sections 2.1.6.3.1 and 2.2.5.4.1 of the DA provide that methane emissions (under the category of $GHG_{bio\text{-}storage}$) should be counted toward $GHG_{associated}$, but can be treated as zero where biomass used for BioCCS or biochar is stored in one of four ways.

91. In respect of BioCCS, methane emissions are an associated GHG emission in §2.1.6.3.1 which relevantly provides for $GHG_{facility}$ to account for $GHG_{bio\text{-}storage}$. That sub-section goes on to provide: "*$GHG_{bio\text{-}storage}$ refers to CH_4 emissions due to biomass storage prior to processing at the facility where CO_2 is captured.*" That sub-section goes on to provide equation [20] which accounts for "*GWP_{CH4} = global warming potential of methane, 100 year basis*".

92. The zero-rating of methane emissions in respect of BioCCS is provided by §2.1.6.3.1 when one of four practices are followed:

> "*$GHG_{bio\text{-}storage}$ shall be set to zero for a quantity of feedstock if one or more of the following practices are followed for all biomass utilised:*

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[50] Forster P. and Storelvmo T., *Climate Change 2021 The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Chapter 7, available at https://www.ipcc.ch/report/ar6/wg1/chapter/chapter-7/#7.6: table 7.15 in section 7.6.1.1, referring to "*CH_4 – non fossil*"

[51] European Commission, *Methane emissions*, available at https://energy.ec.europa.eu/topics/carbon-management-and-fossil-fuels/methane-emissions_en

52 Whittaker, et al. 2016. Dry matter losses and methane emissions during wood chip storage: the impact on full life cycle greenhouse gas savings of short rotation coppice willow for heat. Bioenergy Res. 9:820-835. https://link.springer.com/article/10.1007/s12155-016-9728-0

(a) biomass stored consists of coarse woody material that naturally remains well aerated;

(b) biomass that is stored in a form that does not necessarily remain naturally aerated shall either:

(i) be stored for no more than four weeks prior to processing; or

(ii) be stored with a maximum of 30 % residual moisture;

(c) biomass is pelleted for storage;

(d) operators otherwise demonstrate that biomass is stored in a way that avoids significant CH_4 emissions from anaerobic decomposition given the nature of the feedstock and the local conditions."

93. In respect of biochar, the inclusion of methane emissions as an associated GHG emission is provided in §2.2.5.4.1 (which functions analogously to BioCCS) and contains the same zero-rating if any of the four storage practices are used.

94. However, these storage practices are incapable of ensuring that there are zero or negligible methane emissions from the biomass. In its response to a consultation on the DA, PFPI commented on the Commission's proposal and cited relevant scientific evidence that methane emissions are poorly characterised and understood but there is evidence that emissions may be substantial even under these same conditions.[53] There is further evidence that the four practices that permit methane emissions to be counted as zero are probably inadequate and are in any case vague and unenforceable.

95. More information is becoming available on this topic, including a study that examined methane emissions from wood chips across a range of temperatures, moisture contents, and oxygen availability conditions. Results found some of the highest rates of methane emissions at an oxygen content of 20%, close to that of ambient air. Emissions spiked within 30 days, were elevated at normal post-harvest wood moisture content of 50%, and were even higher at 70%.54

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[53] PFPI's consultation response at https://forestlitigation.org/wp-content/uploads/2026/06/PFPI-Lifescape-comments-on-CRCF-consultation-Sep-22-2025.pdf. References cited in the consultation response: Warner, D. L. *Biogeochemical controls and spatial modeling of CO2 and CH4 fluxes in a complex forest landscape*. (2018); Mukhortova, L., et al. Temperature Sensitivity of CO2 and CH4 Fluxes from Coarse Woody Debris in Northern Boreal Forests. Forests 12, 624 (2021); Lenhart, K. et al. *Evidence for methane production by saprotrophic fungi*. Nat Commun 3, 1046 (2012)
Vantellingen, J. & Thomas, S. C. Log landings are methane emission hotspots in managed forests. Can. J. For. Res. 51, 1916–1925 (2021); Svedberg, U., et al. *Hazardous Off-Gassing of Carbon Monoxide and Oxygen Depletion during Ocean Transportation of Wood Pellets*. Ann Occup Hyg 52, 259–266 (2008); Kuang, X. et al. *Rate and Peak Concentrations of Off-Gas Emissions in Stored Wood Pellets—Sensitivities to Temperature, Relative Humidity*, and Headspace Volume. Ann Occup Hyg 53, 789–796 (2009)

54 Geronimo et al. 2022. Overlooked emissions: Influence of environmental variables on greenhouse gas generation from woody biomass storage. Fuel. 319:123839. See Fig. 1. At https://www.sciencedirect.com/science/article/pii/S0016236122006986

Temperature played a key role, with emissions increasing with incubation temperature. It is well-understood that emissions from wood chip and other biomass piles can increase rapidly in temperature, even to the point of spontaneous combustion.55

96. The Commission's criteria for storage are not adequate.

    a. For the condition that coarse woody debris should naturally remain well-aerated, this presumably refers to biomass before it is chipped for consumption. But for all biomass being chipped, it is reasonable to assume that all biomass will spend some undefined amount of time in a wood-chip pile, where conditions may quickly lead to methane formation.

    b. For the condition that biomass should be stored no more than four weeks due to processing, it is not clear if "processing" means consumption; in any case, studies show that emissions can accumulate in less than four weeks. Additionally, wood industry residues may be stored at the site of origin for weeks before they converted to biomass fuel.[56]

    c. For the condition that biomass be stored with a maximum 30% residual moisture, achieving this moisture content requires either mechanical drying, or sufficiently long storage to allow air-drying,[57] which would itself likely lead to methane emissions.

    d. For the condition that biomass can be pelletized for storage, wood pellets are also known to produce methane. Citing from PFPI's comments, on transport ships, methane and carbon monoxide as well as assorted VOCs are produced in quantities dangerous to human exposure within a week after loading.[58] This off-gassing of pellets has led to fatal accidents during the interoceanic transport of wood pellets. Off-gassing and self-heating of wood pellet piles are both issues that carry direct risk of injury to workers, and as a result, have been well studied. For example, Kuang et al. (2009) found that CH_4 off-gassing was affected by temperature and headspace volume, with increasing

55 IEA Bioenergy: Task 43: 2019. Dry matter losses during biomass storage - Measures to minimize feedstock degradation. Page 27 at https://task43.ieabioenergy.com/wp-content/uploads/2020/01/EIA-Dry-Matter-Loss_Final.pdf

[56] Röder, M., et al. (2015), *How certain are greenhouse gas reductions from bioenergy? Life cycle assessment and uncertainty analysis of wood pellet-to-electricity supply chains from forest residues*. Biomass and Bioenergy 79: 50-63. At http://www.sciencedirect.com/science/article/pii/S0961953415001166

[57] Whittaker, et al. 2016. Dry matter losses and methane emissions during wood chip storage: the impact on full life cycle greenhouse gas savings of short rotation coppice willow for heat. Bioenergy Res. 9:820-835. https://link.springer.com/article/10.1007/s12155-016-9728-0

[58] Svedberg, U., et al. *Hazardous Off-Gassing of Carbon Monoxide and Oxygen Depletion during Ocean Transportation of Wood Pellets*. Ann Occup Hyg 52, 259–266 (2008).

concentrations of CH_4 present through time as temperature increased and headspace decreased.[59]

97. Overall there is abundant evidence that methane emissions occur at a range of moisture, temperature, and time conditions that overlap with the conditions specified by the Commission. Given that methane emissions are known to be variable, but are apparently rarely or never zero, the Commission could have assigned a typical average rate of methane emissions to be included in $GHG_{associated}$.

98. The Commission erred in excluding methane emissions in relation to biomass for BioCCS or biochar that is stored under these conditions because the CRCF Regulation requires the Commission – without qualification – to take account of all GHG emissions and the best available scientific evidence demonstrates that there are real and quantifiable emissions associated with those activities. Excluding these emissions is irreconcilable with the conservative approach the Commission was required to take.

Unlawful inconsistency with the CRCF Regulation

99. The exclusion of CH_4 emissions when biomass is stored in the prescribed manners is inconsistent with the requirements of the CRCF Regulation.

100. First, it proceeds on an error of law. Art. 4(1)(c) CRCF provides that the calculation of the net carbon removal of the activity shall account for GHGassociated, defined as "the increase *in direct and indirect greenhouse gas emissions over the entire lifecycle of the activity which are attributable to its implementation*". Accordingly, the CRCF Regulation requires that all GHG emissions be accounted for. It does not provide for zero-ratings of any GHG emissions, let alone a GHG with very high GWP.

101. The inclusion of all GHG emissions (whether they be categorised as direct or indirect emissions) within $GHG_{associated}$ was a choice made by the Legislature. It is an essential element of Art. 4(1) which provides the central definition upon which the entire CRCF Regulation relies. The Commission was not competent to amend or supplement this essential element of the CRCF Regulation by introducing a zero-rating for a highly potent GHG emission in the DA.

102. Second, the Commission failed to act according to the latest and best available scientific evidence (see Art. 8(4)(c)). Having disregarded the evidence before it showing that, even when the four practices are followed, substantial methane emissions are generated and then failing to

[59] Kuang, X. et al. *Rate and Peak Concentrations of Off-Gas Emissions in Stored Wood Pellets—Sensitivities to Temperature, Relative Humidity, and Headspace Volume*. Ann Occup Hyg 53, 789–796 (2009).

set certification methodologies that address this source of methane emissions, the Commission acted unlawfully.

103. Third, unless the Commission could conclusively demonstrate that there are in fact zero CH_4 emissions from biomass stored in the four prescribed manners (which it cannot), the decision in the DA Annex to discount these emissions entirely is irreconcilable with the "*conservative*" approach the Commission is required to take under Art. 4(7) and Art. 4(12) CRCF, and CRCF Annex I para. (i).

Ground 4: failing to account for indirect land use change in the quantification certification methodologies

104. Recital 11 DA asserts that there is "*not expected*" to be "*significant*" ILUC if the biomass used for BioCCS or biochar activities is sourced from waste or residues, or adheres to the cascading use of biomass principle, and does not displace other uses of biomass or does not increase pressure on land.

105. This is not consistent with the requirements of the CRCF Regulation.

Relevant Background

106. Section 2.3 of the DA Annex provides "*common elements for quantification*". These apply to all activities. The DA Annex provides at §2.3.4.3 that "*ILUC emissions shall be set to zero*" for these activities. This applies to the calculation of $GHG_{facility}$ (part of $GHG_{associated}$) in respect of both BioCCS (in §2.1.6.3.1) and biochar (§2.2.5.4.1).

107. The DA Annex thus relies on the provisions of §4.3.1 (concerning sustainability) as being sufficient to prevent any increases in the consumption of food and feed crops as the basis for its conclusion that there are no ILUC emissions.

108. The DA Annex contains no other provisions that deal with the other ways in which ILUC emissions can be "*expected*" by reference to preliminary paragraph 11: displacement of other uses of biomass, pressure on alternative uses of land (such for wildlife or nature preservation), failure to adhere to the cascading use of biomass principle, or failing to limit sources of biomass only to wastes or residues.

109. Accordingly, the assumption in §2.3.4.3 is that merely preventing the consumption of food and feed crops in BioCCS and biochar activities is sufficient to prevent ILUC emissions. This is flawed. If increasing demand for biomass (such as energy crops like miscanthus, forestry plantations or short rotation coppice) for BioCCS or biochar activities leads to the displacement of other crops (whether or not they are food or feed crops) or drives conversion to other forms

of land use, it will constitute ILUC.[60] The emissions from this ought to be accounted and should not have been assumed to be zero. This has been extensively discussed in scientific literature[61] and IPCC reports[62] and the principle has been applied in a preeminent international greenhouse gas accounting and reporting standard, the GHG Protocol.[63]

Unlawful inconsistency with the CRCF Regulation

110. The assumption that these emissions are zero is inconsistent with the requirements of the CRCF Regulation.

111. First, it proceeds on an error of law. Art. 4(1)(c) CRCF provides that $GHG_{associated}$ "*is the increase in direct and indirect greenhouse gas emissions over the entire lifecycle of the activity which are attributable to its implementation, including indirect land use change*" (emphasis added). Where there are potential ILUC emissions, the DA was required to provide a means for them to be calculated. It is an error of law for the Commission to assume that the emissions are zero as a result of sustainability measures that address only part, but not all, of the sources of ILUC emissions.

112. Second, it is based on a manifest error of assessment [and a failure to act according to the latest and best available scientific evidence, contrary to Art. 8(4)(c) CRCF]. As set out above, ILUC emissions may occur even without consumption of food or feed crops. For the same reasons, this fails to take a conservative approach to ILUC emissions, as required by under Art. 4(7) and Art. 4(12) CRCF, and CRCF Annex I para. (i).

I. Grounds of review relating to Art. 6 CRCF: storage, monitoring and liability

Ground 5: failing to set monitoring rules (or lawful monitoring rules) in respect of biochar activities

113. The DA Annex addresses the monitoring of biochar activities in §1.2.2.2 and §3.2. In both provisions, the DA Annex provides two (identical) approaches to monitoring, both of which impose very limited obligations. At their lowest, they do not require monitoring at all and at their highest they only provide for monitoring for a maximum of two years. This is unlawful because

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[60] World Resources Institute, Avoiding Bioenergy Competition for Food Crops and Land, 28 January 2015 https://www.wri.org/research/avoiding-bioenergy-competition-food-crops-and-land

[61] Assessing the efficiency of changes in land use for mitigating climate change at www.nature.com/articles/s415860018-0757-z

[62] See for example AR6 Working Group III chapter 7 (https://www.ipcc.ch/report/ar6/wg3/chapter/chapter-7/) and the Special Report on Climate Change and Land, chapter 6 (https://www.ipcc.ch/srccl/chapter/chapter-6/)

[63] Specifically, in the Land Sector and Removals Standard | GHG Protocolhttps://ghgprotocol.org/land-sector-and-removals-standard. This addresses emissions caused by the caused by displacement of production (food, feed, etc.) as part of a broader framing that it labels "land use and leakage", for which it requires calculations based on 'carbon opportunity cost'.

monitoring is a mandatory requirement set in the CRCF Regulation and the omission of certain monitoring requirements is irreconcilable with the conservative approach that the Commission was required to take, as well as inconsistent with the best and latest scientific evidence.

Relevant Background

114. Section 1.2.2.2 provides the following monitoring periods for biochar activities:

> "*The monitoring period for BCR [biochar] activities shall be:*
> *(a) for activities that use biochar by application to soil, where application to soil is directly overseen by the certification body the period up to application, otherwise the period up to one year after the end of the certification period during which the biochar is reported to have been applied to the soil;*
> *(b) for activities that use biochar by incorporation in products, the period up to the point at which it is demonstrated that the biochar has been incorporated*"

115. Identically, §3.2 provides for monitoring to take place only during those periods.

116. In respect of the application of biochar to soils, the DA Annex thus provides for two different monitoring scenarios. The first scenario is where biochar is "*applied*" to soils under the supervision of a certification body. In that scenario, the DA Annex provides for no monitoring after that point of "*application*". The second scenario is where biochar is "*applied*" unsupervised. In that scenario, monitoring is possible but not actually required; all that §1.2.2.2 and §3.2 require is that a certification may access the site "*upon request*". Such request must be made within a two-year period, after which there can be no possibility of monitoring at all (per §1.2.2.2 and §1.2.2.3). Accordingly, monitoring is only possible for a maximum of two years for the unsupervised application of biochar and there is no monitoring at all for supervised biochar application after the point of application.[64]

117. Section 3.2 purports to justify this absence of further monitoring on the basis that "*the risk of reversals is characterised through the assessment of the permanence fraction of the biochar and it is not practically possible to directly identify reversals after the point of application or incorporation*." The reference to the "*permanence fraction of the biochar*" relates to the rules in §2.2.7.1. These provide for two means of calculating the amount of carbon that the DA Annex assumes is stored permanently when the biochar is applied to soils: the two means are identified

[64] The process of "*applying*" biochar to soils is no more technical or complex than dumping, spreading or injecting it across soils. Section 1.1.2.2.1 DA Annex provides that BCR may be applied either to agricultural, forest or "*other*" soils (such as urban soils, landfill sites or "*filling holes*"). This section does not provide a technical explanation for how the BCR may be "*applied*".

as "*random reflectance assessment*" (§2.2.7.1.1) and "*decay function*" (§2.2.7.1.2). Both of these require laboratory steps to estimate the permanency fraction of the biochar based on assumed temperatures in the soil to which it is applied. Neither means accounts (nor could they) for other causes of erosion such as wind, water, ploughing, fungi, bacteria, and any number of environmental factors. That the effect of these will vary depending on the site, type of soils and weather conditions in the immediate aftermath of the biochar being "*applied*" (amongst endless other environmental factors) is self-evident.[65]

118. It is impossible in a laboratory setting to estimate the impact of these on the decomposition of the soil storing the carbon. There is a lack of evidence as to the long-term storage (or durability) of carbon by biochar applied to soils in a real world setting.[66] This is why even recent studies, which can be taken to represent the best available science, confirm that: "*The stability of biochar in the soil could offer the potential for long-term carbon storage, although this is still uncertain due to a lack of large scale, long duration studies*".[67] One notable assessment of the application of biochar to European soils also concluded: "*To date, no evidence has been found to suggest that the use of biochar in Swiss agriculture leads to increased yields. Long-term effects on soil and soil organisms are still unclear and may be irreversible. Biomass is a valuable raw material, and there is competition for its use. The potential of biochar to mitigate climate change is limited,*

[65] On the general unpredictability of biochar as a store of carbon, see Woolf, et al., *Greenhouse Gas Inventory Model for Biochar Additions to Soil*, s: Environ. Sci. Technol. 2021, 55, 14795−14805 at https://bpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/8/7329/files/2021/11/EST-55-14795-14805-2021-Woolf.pdf

[66] Illustrating the difficulty of monitoring changes in soil carbon stocks, Part 1 of the impact assessment for the CRCF states (page 35), "*The quantification of removals through soil carbon restoration, for example, will likely require the use of multiple tools to interpolate soil carbon stock changes between highly discrete sampling sites, and the use of predictive models to estimate changes of carbon stock under differing conditions. The use of remote sensing data to calibrate these predictive models against vegetation cover and weather conditions will likely prove vital to the effective scale-up of certification for these types of activities*". [Part 2 contains a table at page 73 that refers to soil carbon in cropland and grassland, stating *"High variability of soil carbon stocks across locations make quantification very challenging using current technologies, implying that solutions need to be developed to address statistical uncertainty at field level."* Finally, the impact assessment itself repeatedly cites a paper whose introductory sentences lay out the problem: "*Soil organic carbon (SOC) represents a stock of around 1,500–2,400 Gt C (~5500–8800 Gt CO_2) in the top metre of soils globally (Batjes, **1996**; Sanderman, Hengl, & Fiske, **2017**). The lower estimate in the range is approximately three times the stock of carbon (C) in vegetation and twice the stock of C in the atmosphere (Smith, **2012**). Small changes in C stocks can therefore have significant impacts on the atmosphere and climate change*." (Smith P, Soussana J-F, Angers D, et al. How to measure, report and verify soil carbon change to realize the potential of soil carbon sequestration for atmospheric greenhouse gas removal. Glob Change Biol. 2020;26:219–241 at https://doi.org/10.1111/gcb.14815)

[67] European Scientific Advisory Board on Climate Change, *Scaling up carbon dioxide removals – Recommendations for navigating opportunities and risks in the EU* (February 2025), p.5 at https://climate-advisory-board.europa.eu/news/new-report-from-the-eus-climate-advisory-board-outlines-recommendations-to-scale-up-carbon-dioxide-removals-while-addressing-opportunities-and-risks; Biofuelwatch, *Biochar: a critical perspective* (May 2024) https://www.biofuelwatch.org.uk/wp-content/uploads/Biochar-briefing-2024.pdf; Biofuelwatch, *Biochar poses new threat to forests in France* (November 2024) https://www.biofuelwatch.org.uk/wp-content/uploads/Garlin-biochar-project-briefing-.pdf

and its use is generally not economically viable. Widespread use is not recommended until any possible harmful effects can be ruled out."[68]

Unlawful inconsistency with the CRCF Regulation

119. This is inconsistent with the requirements of the CRCF Regulation.

120. First, it proceeds on the basis of various errors of law. Art. 6(1) CRCF provides that operators are obliged to demonstrate the permanence of their claimed carbon removals: "*An operator or group of operators shall demonstrate that an activity stores carbon permanently or is aimed at storing carbon over the long-term*." Art. 6(2) CRCF provides that they must demonstrate this through a monitoring period: "*For the purposes of paragraph 1, an operator or group of operators shall be: (a) subject to monitoring rules and rules on the mitigation of any identified risks of reversal occurring during the monitoring period*". Contrary to these requirements, the DA Annex does not impose a monitoring period or a monitoring requirement on biochar activities beyond the point of 'supervised' application to the soils (or beyond a period of two years from an 'unsupervised' application).

121. Further, Art. 6(3) deals with the monitoring periods for "*permanent carbon removals*" (which is applicable here). Art. 6(3) provides that the "*monitoring rules … shall: be consistent with the rules set out in Articles 13 to 16 of Directive 2009/31/EC*". The rules in Art. 13 of that Directive require monitoring of injection facilities, storage complex and the surrounding environment. The DA Annex does not require any such monitoring for biochar storage sites.

122. Second, the inclusion of monitoring as a mandatory element of the quality criteria was a choice made by the Legislature. It is an essential element of the CRCF, set by the Legislature to ensure the robustness of the schemes established under the legislation. The Commission was not competent to amend or supplement this essential element of the CRCF Regulation by deciding to remove or reduce monitoring of biochar activities.

123. Third, the Commission failed to act according to the latest and best available scientific evidence, contrary to Art. 8(4)(c) CRCF. The rationale for the Commission's exclusion of monitoring for biochar activities is provided in Recital 6 DA and §3.2 DA Annex.

    a. Recital 6 DA provides: "*Considering the low risk of reversal of the fraction of biochar that has been identified as stable, and the use of a conservatism factor in the quantification of the permanent fraction of the biochar, no further monitoring should*

[68] Swiss Federal Office for the Environment, *Biochar in Swiss agriculture – risks and opportunities for soil and climate* (19 March 2026): https://www.bafu.admin.ch/en/biochar

be required beyond the point at which the biochar is demonstrated to have been applied to the land or incorporated into a product."

b. §3.2 DA Annex asserts that "*it is not practically possible to directly identify reversals after the point of application or incorporation*".

124. In both respects, the Commission's decision was contrary to and failed to account for best available scientific evidence. The scientific evidence noted above demonstrates that the durability of biochar is an unpredictable as a form of carbon storage. This is exacerbated by the lack of monitoring, or adequate monitoring, in the DA Annex. Reflecting this difficulty, the Commission's acknowledgement in §3.2 DA Annex that "*it is not practically possible to directly identify reversals after the point of application or incorporation*" means that the possibility of certification bodies requesting access to site to monitor them within the two years after application (per §1.2.2.2) is entirely redundant. It also reveals that, when faced with scientific uncertainty about how to monitor biochar storage, the Commission decided that there need in reality be no monitoring at all. But that was not a decision open to it. Rather, having accounted for the latest and best available scientific evidence, the only valid option available to the Commission was to recognise that biochar cannot simply be "*applied*" to soils; instead, carbon from biochar can only be stored in the long term when it is incorporated in products or potentially buried.

125. Fourth, relatedly, in light of the scientific uncertainty about the durability of biochar as a carbon store, the Commission was required to act in accordance with the precautionary principle when setting the certification methodologies in the DA. That principle requires that, where there is a risk to the environment, the Union institutions must take appropriate measures to protect the environment over the prioritisation of economic interests. The principle is a positive obligation on the EU institutions. As the Grand Chamber has explained, *"[t]here is therefore an obligation on the EU legislature, when it adopts rules governing* [… an environmental matter …] *to comply with the precautionary principle*".[69] The principle justifies the EU institutions in adopting "*restrictive measures*"; necessarily, it also obliges the institutions to assess the scientific evidence before it and, in a situation where there is uncertainty, to adopt the route that gives rise to the least risk to the environment. The Grand Chambers has confirmed it can subject such a decision to juridical review on a manifest error threshold.[70]

[69] Judgment of 1 October 2019, *Blaise*, C-616/17, EU:C:2019:800, §42
[70] Judgment of 1 October 2019, *Blaise*, C-616/17, EU:C:2019:800, §§44-46, 50

126. This is closely aligned to the obligation required by Art. 4(7) and Art. 4(12) CRCF, and CRCF Annex I para. (i) that the Commission adopt a "*conservative*" approach when making delegated legislation in this sphere. The practical effect of this is that the Commission should not assume, where it is not certain, that an activity does not give rise to emissions or that it is not necessary to impose monitoring obligations. The wording imposed by the legislature constrains the Commission's margin of discretion and obliges it to adopt an approach that secures a high standard of environmental protection, particularly in areas of scientific uncertainty.

127. Applied here, the Commission was required to identify and assess the degree of scientific uncertainty about the ability to monitor the reliability of biochar as a carbon store. The Commission failed to do this in the DA. Instead of adopting restrictive measures, it decided in the face of the scientific uncertainty to provide only minimal (or no) monitoring of biochar activities. That was a manifestly erroneous response to the scientific uncertainty in light of the precautionary principle.

128. Fifth, there is clear scientific evidence that "*black carbon*" (i.e. soot), which is essentially what biochar is, is a particularly potent contributor to global warming. When it becomes airborne, it can land on snow and ice (such as glaciers and sea ice), causing them to absorb heat (rather than reflect it) and melt.[71] The possibility of fine biochar particles becoming airborne is inherent in the application of it to soils that are exposed to erosion. Despite this, the DA contains no measures to assess or monitor the extent of black carbon produced by biochar activities or the extent of the risk of it becoming airborne. This omission constitutes a manifest error of assessment in light of the precautionary principle and/or a failure to account for the "*latest*" and "*best scientific evidence*", contrary to Art. 4(7) and Art. 8(4)(c) CRCF.

J. Ground relating to Arts. 7 and 8 CRCF: sustainability

Ground 6: failing to adhere to minimum sustainability requirements in respect of biomass harvesting and use

129. Art. 7(1) CRCF provides that certified activities "*shall do no significant harm to the environment … for one or more of the following sustainability objectives: (a) climate change mitigation beyond the net carbon removal benefit and net soil emission reduction benefit referred*

[71] Institute for Governance & Sustainable Development, *Reducing Black Carbon May Be the Fastest Strategy for Slowing Climate Change, IGSD/INECE Climate Briefing Note* (December 2008). Available at https://igsd.org/docs/IGSD%20BC%20Climate%20Briefing%20Note_clean.pdf;
Ackerman A, *et al*, *Reduction of tropical cloudiness by soot* (2000), *Science*, 288, 1042–1047. Available at doi:10.1126/science.288.5468.1042

to in Article 4(1) and (2); (b) climate change adaption; … (e) pollution prevention and control; (f) protection and restoration of biodiversity and ecosystems, including soil health".

130. Art. 7(3) CRCF requires the Commission to set "*minimum sustainability requirements"* to ensure the activity meets the standard set out in Art. 7(1). Those requirements should further "*take into account the impact of the activity both within and outside the Union as well as local conditions*" (Art. 7(3)(a)); "*where appropriate, be consistent with the technical screening criteria for the 'do no significant harm' principle*" (Art. 7(3)(b)); and "*promote the sustainability of forest and agriculture biomass raw material*" in line with the sustainability and GHG savings criteria in Art. 29 Directive (EU) 2018/2001 (Art. 7(3)(c)).

131. Art. 8(3)(g) CRCF further provides that the "*certification methodologies shall … ensure the avoidance of unsustainable demand for biomass raw material*".

132. §4.1 of the DA Annex lays out the relevant minimum sustainability requirements for compliance with Art. 7(1) for both BioCCS and biochar. §§4.2 and 4.3 set out further criteria for compliance with Art. 8(3)(g). As set out below, those requirements fail to satisfy the DNSH requirements imposed by the CRCF Regulation in respect of several sustainability objectives, in violation of Arts. 7(1) and 7(3) CRCF, thereby undermining the Union's climate and environmental objectives.

Limb 1: failing to include minimum sustainability requirements that ensure DNSH to climate change mitigation and avoidance of unsustainable biomass demand

Relevant Background for Limb 1 of Ground 6

133. The best and latest available scientific evidence clearly shows that biomass use can do significant harm to climate change mitigation. As demonstrated above, biomass use for energy generates significant carbon emissions, often higher than fossil fuels. In addition, increased logging, much of it for bioenergy, has already contributed to the decline of Europe's forest carbon sink from ~440 million tonnes in 2010 to ~290 million tonnes in 2021.[72] A report by the JRC found that about half of the total wood harvested in the EU is directly or indirectly used for the production of energy, and harvesting for bioenergy is one of the drivers that can explain the increase in tree felling and extraction in recent years.[73] The Commission itself knows – and has

[72] See Fig. 1 at Korosuo et. al., "The role of forests in the EU climate policy: are we on the right track?" (30 July 2023). At https://cbmjournal.biomedcentral.com/articles/10.1186/s13021-023-00234-0.
[73] Camia, A, *The use of woody biomass for energy production in the EU* (fig 14, page 49), Publications Office of the European Union, Luxembourg, 2020, https://data.europa.eu/doi/10.2760/831621;

acknowledged – that biomass does not have net zero emissions even when harvested in line with Directive (EU) 2018/2001's sustainability criteria, but in fact has emissions even "*higher than emissions from fossil fuels beyond a policy-relevant timeframe for sawnwood, stumps, coarse dead wood*".[74]

134. Yet, the DA's minimum requirements intended to ensure no significant harm is done to the climate change mitigation objective (Art. 7(1)(a)) merely provide that "*[t]he eligibility requirements listed in Section 1.1 prevent the certification of activities that significantly harm the objective of climate change mitigation*" (§4.1.1).

135. The DA therefore establishes no actual independent minimum sustainability requirement: it considers that, by definition, activities eligible under the DA cannot significantly harm climate change mitigation. This means that the DA solely relies on the quantification methodology for carbon removals and compliance with the Directive (EU) 2018/2001 sustainability criteria.

Unlawful inconsistency with the CRCF Regulation for Limb 1 of Ground 6

136. Reliance on the quantification methodology for carbon removals and compliance with the Directive (EU) 2018/2001 sustainability criteria is not sufficient to ensure that BioCCS and biochar activities do not significantly harm climate change mitigation. Under §4.1.1 of DA Annex, those activities may in fact cause significant harm to that objective.

137. As demonstrated above under Grounds [1]-[4], the DA quantification methodology does not account for the majority of the lifecycle GHG emissions linked to the carbon removal activities. Due to such deficiencies in the methodology, it is impossible to prevent certification of net-emitting activities. The DA therefore allows activities that may result in net emissions – and thus contribute to climate change – to be certified as climate solutions.

138. In addition, compliance with Art. 29 of Directive (EU) 2018/2001, relied on in the quantification methodology, does not prevent the carbon stocks from being reduced (see further above at para. 69(c)). It does not require a party to demonstrate that those stocks are maintained: it demands only that harvested area be regenerated, and that the overall productive capacity of the forest be preserved over time. Those conditions may be satisfied even though carbon stocks

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JRC, *The European forest carbon sink is declining: can we reverse the trend?* https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/european-forest-carbon-sink-declining-can-we-reverse-trend-2025-07-30_en (30 July 2025), finding that the land sector sink has declined by 27% from 2010-2014 until 2020-2022.
Cazzaniga N.E., Jonsson R., Pilli R., Camia A. (2019). Wood Resource Balances of EU-28 and Member States. EC Joint Research Centre, Publications Office of the European Union, Luxembourg.

[74] See 2016 Directive (EU) 2018/2001 impact assessment, where the Commission expressly recognises that the bulk of scientific literature shows that forest biomass result for bioenergy can result in net GHG emissions, and that those emissions remain "*higher than emissions from fossil fuels beyond a policy-relevant timeframe for sawnwood, stumps, coarse dead wood*"

are materially and durably reduced. An activity satisfying those conditions may therefore cause net harm to climate change mitigation while remaining fully compliant with the DA's criteria.

139. Further, the DA does not contain sufficient safeguards to prevent CRCF activities from resulting in increased biomass harvesting and consumption. It creates a financial incentive to certify BioCCS and biochar activities. That incentive is precisely intended to result in increased biomass consumption relative to the baseline scenario, whether through new capacity or increased throughput within existing capacity:

    a. For BioCCS, the DA expressly permits facilities to source from additional biomass consumption the energy required to capture and store CO_2. That additional biomass consumption is by definition new demand that would not occur in the baseline scenario.

    b. For biochar, all biomass consumption constitutes new demand: biochar facilities would not operate in the baseline scenario at all, so every tonne of biomass they consume increases competition for biomass relative to that scenario.

    c. In this context, scientists have confirmed that the DA methodology risks adding to the perverse incentives for extraction of biomass, in a situation where the EU forest carbon sink is already weakening.[75]

140. While the DA contains restrictions that partially limit this effect, these restrictions cannot prevent biomass demand (and use) from increasing:[76]

    a. §4.3.1(a) requires newly constructed or recently converted BioCCS facilities to demonstrate financial viability without CRCF revenue – a safeguard against the construction of biomass facilities that would not exist without the CRCF incentive; §4.3.1(b) prevents established BioCCS facilities from expanding their nameplate energy generation capacity beyond what is necessary to supply the capture process. However, these restrictions do not prevent increases in biomass throughput within existing nameplate capacity.

    b. §4.3.2 restricts eligible biochar feedstocks to waste and residual materials within the meaning of Arts. 2(23) and (43) Directive (EU) 2018/2001 where biochar is the primary output. However, as stated above, this restriction (i) does not apply where biochar represents less than 50% of total energy outputs, thereby allowing use of saw logs,

[75] ESABCC, Scaling-up carbon dioxide removals: recommendations for navigating opportunities and risks in the sector (2025) p. 151 https://climate-advisory-board.europa.eu/reports-and-publications/scaling-up-carbon-dioxide-removals-recommendations-for-navigating-opportunities-and-risks-in-the-eu (20 February 2025)

[76] See Öko-Institut, "Does the CRCF methodology for permanent removals align with the PACM?" (October 2025), pp. 12 and 15-16

veneer logs or industrial grade roundwood, and (ii) still fails to ensure that eligible feedstocks are those which would otherwise have rapidly decomposed (assuming the goal of the waste/residues provision is to ensure that feedstocks are mainly comprised of materials that would decompose and emit GHGs, so that incorporation of the carbon into long-lived biochar avoids some emissions).

c. In addition, neither provision addresses market-level demand effects: increased certified activity across the sector as a whole increases competition for biomass supply regardless of individual facility-level restrictions.

141. Such increased biomass consumption leads to additional biomass harvesting, which in turn increases land sector emissions and/or decreases land sector sinks, which can result in net GHG emissions.

142. In any event, and in the alternative, Art. 7(1)(a) CRCF requires the activity to DNSH to climate change mitigation "*beyond the net carbon removal benefit … referred to in Article 4(1) and (2)*". It follows that, even assuming – *quod non* – that the quantification methodology under the DA did establish a net carbon removal benefit within the meaning of Art. 4(1) CRCF, the DA should have acknowledged and addressed these established risks – known to the Commission – of significant harm to climate change mitigation. The DA itself recognises at §4.3.3 that regeneration of carbon stocks may be necessary – or at least desirable – to compensate for those "*used for the generation of permanent carbon removals*", an implicit acknowledgment that, absent such regeneration, the activity may not deliver a genuine net atmospheric removal. The DA should accordingly have included appropriate safeguards to ensure that certification does not incentivise use of biomass feedstock known to result in net emissions (e.g. by establishing strict eligibility requirements linked to the type of feedstock used as described above), so as to ensure net-emitting activities are prevented from being certified. The failure to do so means that emission-intensive activities are positively incentivised and endorsed by the Commission. The complete lack of independent minimum requirement in §4.1.1 beyond the quantification methodology thus constitutes a clear violation of Art. 7(1)(a).

143. Therefore, §4.1.1 is not compatible with Art. 7(1)(a) CRCF which requires that certified activities do no significant harm to climate change mitigation. As stated above, any increase in GHG emissions resulting from action to increase carbon removal would likewise be

incompatible with the CRCF's climate neutrality goal under Art. 1(2) CRCF, as well as the Union's climate targets under the ECL and the Paris Agreement.[77]

144. It also follows from the above that the DA Annex, in particular §§4.1.1, 4.3.1 and 4.3.2, contravene Art. 8(3(g) CRCF by failing to ensure avoidance of unsustainable demand for biomass.

145. Accordingly, the DA should be reviewed on these further grounds.

Limb 2: failing to include minimum sustainability requirements that ensure DNSH to climate change adaptation

146. As regards climate change adaptation (Art. 7(1)(b)), §4.1.2 of the DA Annex only requires operators to "comply with the criteria related to climate adaptation set out in Appendix A to Annex 1 to Commission Delegated Regulation (EU) 2021/2139". Section I of that Appendix sets out generic DNSH criteria in relation to climate change adaptation applicable to different types of activities.

147. While "significant harm" to climate change adaptation is not defined by the CRCF, Art. 17(1)(b) Taxonomy Regulation defines it as being where the activity leads to an increased adverse impact of the current climate and the expected future climate, on the activity itself or on people, nature or assets. It is suggested that, for consistency across policy, this is an appropriate definition for these purposes.

148. Forests play an essential role as natural buffers against the climate hazards. Intact, resilient forests are essential to climate adaptation as they regulate the water cycle, reduce surface runoff, thereby reducing the severity of flooding – hazards that are explicitly listed in Appendix A and that are intensifying as a result of climate change. The following risks may arise as a result of BioCCS and biochar activities:

a. To the extent that BioCCS activities put more pressure on forests, and indeed put more pressure on land overall, this will reduce society's ability to adapt to climate change. This assessment is corroborated by the European Scientific Advisory Board on Climate change established under the ECL specifically to provide independent scientific knowledge, expertise and advice on climate change,[78] which recently found that the EU's reliance on bioenergy and BioCCS to reach net zero raises concerns about sustainability due to the impacts of biomass extraction on land use, water, biodiversity

[77] ECL, Art. 1 and 2(1) and Art. 2(1)(a) and 4(1) of the Paris Agreement.
[78] Art. 3, ECL.

and carbon sinks.[79] In addition, the DA's approach to climate change mitigation risks coming at the expense of the forest and land carbon sink, and obviously at the expense of healthy, functioning ecosystems, because dedicated logging is not excluded from the criteria in Directive (EU) 2018/2001.

b. For biochar activities, the application of biochar to soils may also alter soil hydrology and water-retention capacity, with potential consequences for run-off, flood risk and water availability affecting other land users downstream. This too is a harm caused by the activity to the adaptive capacity of people, nature and assets. The potential impact of black carbon from biochar was addressed above.

149. There are no requirements in Appendix A that would, or even attempt to, prevent these harms from occurring. Instead, the criteria in Appendix A require only that the activity be accompanied by adaptation solutions that "*reduce*" the "*most important*" climate risks associated with the activity. That falls below the Art. 7(1)(b) standard ("*shall do no significant harm…*"), and is directed at the wrong harm entirely: the criteria flow from a climate risk assessment whose sole object is risks that "*may affect the performance of the economic activity*" – the impact of the climate on the activity itself – with no requirement to consider the impact of the activity on the climate resilience of people, nature and assets.

150. By permitting the certification of activities without requiring any assessment of, or solution to, their impact on the adaptative capacity of forest and soil ecosystems and on the people, nature and assets dependent upon them, the requirements referred to at §4.1.2 of the DA Annex fail to ensure that carbon removal activities do no significant harm to climate change adaptation as required by Art. 7(1)(b) CRCF. The Commission thereby erred in law by discharging its mandate under Art. 8(2) DA by the bare cross-reference in §4.1.2 to Appendix A. The DA should be reviewed on this further ground.

Limb 3: failing to include minimum sustainability requirements that ensure DNSH to pollution prevention and control

Relevant Background for Limb 3 of Ground 6

151. BioCCS and biochar activities can generate substantial pollution that the DA methodology fails to capture and prevent. Wood-burning power plants emit as much or more major air pollutants per unit (MWhr) of energy produced as fossil fuel-burning plants with the exception

[79] ESABCC, Scaling-up carbon dioxide removals: recommendations for navigating opportunities and risks in the sector (2025) p. 145.

of sulphur, which is emitted at high levels from coal-burning.[80] Biomass harvesting and use can be "*dirtier than coal generation with regards to particulate matter and NOx*", since the low efficiency of biomass power plants means they can emit more particulate matter per MWhr of electricity than a same-sized coal plant using the same emission controls.[81] Wood-burning plants are vastly more polluting than gas-fired plants.[82] Wood pellet production, should wood pellets be the fuel at a BioCCS plant, is also a significant source of pollutant emissions.[83] The processes for producing biochar likewise emit air pollution, but perhaps of even greater concern is the potential for biochar to add to "fugitive" particulates and black carbon at the locations where it is used, and beyond. Transport of biomass and biochar adds further pollutant emissions.

152. Yet, as regards pollution prevention and control (Art. 7(1)(e)), §4.1.5 of the DA Annex only requires operators to "*evaluate and address any potential risks to generate a significant increase in the emissions of pollutants to air, water or land from the activity*". It also provides that facilities falling within the scope of Directive 2010/75/EU "*shall comply with all requirements arising from that Directive*".

Unlawful inconsistency with the CRCF Regulation for Limb 3 of Ground 6

153. The Commission erred in adopting those minimum sustainability requirements; Art. 7(1)(e) CRCF imposes an obligation that the activity "do no significant harm" to pollution prevention and control. Yet §4.1.5 requires operators only to "*evaluate and address any potential risks*" of a significant increase in pollutant emissions. That is not the same standard: an obligation to assess

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[80] M. S. Booth, "Trees, Trash, and Toxics: How Biomass Energy Has Become the New Coal" (2014), Pelham, Massachusetts, Partnership for Policy Integrity, https://www.pfpi.net/wp-content/uploads/2014/04/PFPI-Biomass-is-the-New-Coal-April-2-2014.pdf. Sierra Club, *The Conventional Biomass Industry in California*: "*solid fuel biomass generation releases criteria pollutants (including oxides of nitrogen (NOx), sulfur oxides (SOx), and fine particulate matter) that cause negative human health impacts, including asthma, heart disease, and premature death*".
Health and Environment Alliance, "New infographic on the health and climate threat from wood burning" https://www.env-health.org/new-infographic-on-the-health-and-climate-threat-from-wood-burning/ (11 March 2024);
Arvesen A., *et al.* (2018), "Cooling aerosols and changes in albedo counteract warming from CO 2 and black carbon from forest bioenergy in Norway", *Scientific Reports* 8(1), 1–12; Cai, H. & Wang, M.Q., *Estimation of Emission Factors of Particulate Black Carbon and Organic Carbon from Stationary, Mobile, and Non-point Sources in the United States for Incorporation into GREET* (2014), Argonne National Laboratory, 13 and 31, tbl.15, Listing mean black carbon emissions from biomass-fired boilers as emitting 0.273 g/kWh compared with 0.009 g/kWh from coal-fired boilers.
[81] M. S. Booth, "Trees, Trash, and Toxics: How Biomass Energy Has Become the New Coal" (2014), p. 16
[82] Decades of increased emissions from forest-fuelled BECCS, Nature Sustainability, 20 April 2026 at https://www.nature.com/articles/s41893-026-01817-8.epdf?sharing_token=6lNwFdFjkIi6Vyxn6vt-y9RgN0jAjWel9jnR3ZoTv0P_m4b-6YQzI55-y0FsCXLqV-opn7LJ9my3-PWZ2Es-n2bgLGGv9r9TWMhhsAjNytcye1IhHKF8Zz_-s0qX3v-ZiJIZOui4xVFfHviWyhU2AqK_xFzE-UbUncDCIdsCxphmp0nlgysHGVziXnMvg3MkFQV7bHWaOOFDnzzX1gEkqVnxREKFz0Yhy0OPEVfSdLH7z68yp18E9nenGeRzqKnAh8VDLWnQydPtZQHg0HQvksq5XlZvQSMrlii8qk3HBoadDkG1xqMXxpCuAW4xUgPlHYsBP_nQijdG6lZsvPHg0A%3D%3D&tracking_referrer=www.theguardian.com and The Guardian, 'Eco Wood Burners Product 450 Times More Pollution than Gas Heating – Report, 8 December 2022 at https://www.theguardian.com/environment/2022/dec/08/eco-wood-burners-produce-450-times-more-pollution-than-gas-heating-report
[83] Environmental Integrity Project, "Dirty Deception: How the Wood Pellet Industry Skirts the Clean Air Act" (26 April 2018) at http://www.environmentalintegrity.org/news/biomass-report/

and mitigate risks is weaker than an obligation not to cause significant harm, and permits certification of an activity that does cause such harm provided its risks were evaluated and "addressed". The Commission has thereby unlawfully lowered the level of protection the CRCF Regulation requires.

154. In any case, those minimum requirements fail to consider any of the harms identified above at §157. The provisions in §4.1.5 fall short of the standard that the Taxonomy framework applies to comparable activities. For forest bioenergy activities (§4.8 of Commission Delegated Regulation (EU) 2021/2139), DNSH compliance requires that air emissions be at or below the Best Available Techniques ("**BATs**") ranges set out in the relevant BAT conclusions for large combustion plants, with additional measures required in zones below national air quality limits. By contrast, §4.1.5 imposes only an unquantified self-assessment duty. The contrast is starkest for BioCCS facilities falling below the Industrial Emissions Directive ("**IED**")'s thresholds[84] and for biochar facilities, for which the CRCF DA prescribes no quantified pollution limits at all. This is inconsistent with the requirement under Art. 7(3)(b) CRCF that the minimum sustainability requirements "*shall … where appropriate, be consistent with the technical screening criteria for the 'do no significant harm' principle*".

155. Moreover, in respect of BioCCS, there is no requirement that the energy-generating process that produces the captured CO_2 is itself aligned with the DNSH requirements of the Taxonomy Regulation as regards pollution prevention. The isolation of the capture activity from the energy-generating process that produces the captured CO_2 (see above) can result, under the DA Annex, in the absurd situation where the certified BioCCS activity is part of an integrated bioenergy operation that is deemed to cause significant harm to one or several of the environmental objectives under the Taxonomy Regulation and so would not be considered sustainable to finance.

156. §4.4 of the DA Annex further addresses pollution from biochar specifically. It sets limits on certain heavy metals and organic compounds present within the biochar itself, to be verified by lab analysis prior to application to agricultural, forest or urban soils, or incorporation into cement, concrete or asphalt. However, this focuses only on soil pollution. It does not address emissions arising from biochar at the point of production – neither localised smoke emissions nor the dispersal of "fugitive" particles and black carbon when it is applied to the soil – beyond the vague reference in §4.1.5 to "*a significant increase in the emissions of pollutants to air*". By contrast

[84] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).

with the specific, quantified limits prescribed for compounds contained in the biochar product, the Annex prescribes no specific, quantified threshold values in respect of air emissions, thereby rendering the applicable standard unenforceable in practice.

157. The minimum sustainability requirements under §§4.15 and 4.4 of the DA Annex therefore fail to ensure no significant harm is done to the objective of pollution prevention and control, contrary to Art. 7(1)(e).

158. Further, the DA's recitals offer no explanation for the asymmetry between the specific, quantified thresholds prescribed for soil-borne contaminants under §4.4 and the unquantified self-assessment duty imposed for air emissions under §4.1.5, contrary to the Commission's duty under Article 296 TFEU to state reasons in a manner that enables to assess the basis for its choices.

Limb 4: failing to include minimum sustainability requirements that ensure DNSH to the protection and restoration of biodiversity and ecosystems

Relevant Background for Limb 4 of Ground 6

159. Logging and managing forests for bioenergy harms forest ecosystems and the species therein, even where the activity complies with the criteria of Directive (EU) 2018/2001, which implies only "*considering*" biodiversity and "*minimising negative impacts*".[85] There is extensive evidence that bioenergy demand and associated forest management, including an emphasis on plantations, is already harming forest ecosystems in the EU and in countries from which the EU obtains biomass.[86]

160. As regards the protection and restoration of biodiversity and ecosystems (Art. 7(1)(f)), §4.1.6 provides that: "*Operators shall evaluate and address any potential risks to the good condition or resilience of ecosystems or to the conservation status of habitats and species, including those of Union interest or to the achievement of targets or obligations set out in national restoration plans established under Regulation (EU) 2024/1991 of the European Parliament and of the Council, from the activity*".

[85] See ESABCC, *Scaling-up carbon dioxide removals: recommendations for navigating opportunities and risks in the sector* (2025), p. 152: "*The CRCF regulation provides overarching sustainability safeguards applicable to certified BECCS projects … It does not only require the RED II compliance, but also goes beyond it through clauses on doing no significant harm, sustainability co-benefits …*".

[86] Fern, How bioenergy harms biodiversity (2021) at https://www.fern.org/fileadmin/uploads/fern/Documents/2021/2021_bioenergy_facts_sheet.pdf.

Unlawful inconsistency with the CRCF Regulation for Limb 4 of Ground 6

161. The Commission erred in adopting this requirement. Art. 7(1)(f) CRCF imposes an obligation that the activity "do no significant harm" to the protection and restoration of biodiversity and ecosystems. Yet §4.1.6 requires operators only to "*evaluate and address any potential risks*" to the condition or resilience of ecosystems, the conservation status of habitats and species, and national restoration targets. That is not the same standard: an obligation to assess and mitigate risks is weaker than an obligation not to cause significant harm, and permits certification of an activity that does cause such harm provided its risks were evaluated and "addressed". The Commission has thereby unlawfully lowered the level of protection the Regulation requires.

162. In addition, recital 24 CRCF explicitly requires that "*[p]ractices that produce harmful effects on biodiversity, such as forest monocultures producing harmful effects on biodiversity, should not be eligible for certification*". Yet the DA contains no provision specifically excluding damaging practices such as the use of monocultures for biomass production. This is a manifest failure to respect the Legislature's clear intention to exclude those practices, and an overstep of the Commission's delegated powers.

163. By perpetuating and exacerbating demand for forest biomass, and failing to exclude especially damaging practices such as using and establishing monocultures for biomass, the DA would certify activities that directly undermine biodiversity conservation, contrary to Art. 7(1)(f) and Recital 24.

K. Conclusion

164. The Applicants respectfully request that the Commission review the Delegated Act on the above grounds.