Greenwashing Carbon Removal

Built on unscientific bioenergy rules, the European Commission's proposed methodologies for BECCS and biochar will likely cause even more CO_2 emissions and waste scarce capital

A briefing for European Commission decision-makers

Summary

At this critical stage of the climate and biodiversity crisis, it has never been more urgent to reduce greenhouse gas (GHG) emissions, remove excess carbon dioxide (CO_2) from the atmosphere and restore ecosystems.

In late June 2025, the EU Commission is expected to propose two draft delegated acts under the Carbon Removal and Carbon Farming Regulation (CRCF). These texts will detail the carbon accounting methodologies to be used for certifying two types of 'permanent' carbon removal activities in the EU, which will determine whether they can be labelled as permanent and certified for climate accounting and potential financial incentives: Bioenergy with carbon capture and storage (Bio-CCS/BECCS), and biochar.

At the time of writing, the draft methodologies for the two activities in question are not fit for purpose.

Rather than contributing to removals, activities certified on the basis of these methodologies would likely increase GHG emissions.

BioCCS and biochar do not remove CO_2 directly from the atmosphere but from the biosphere, merely moving it to another storage form (soil or geological) without reducing atmospheric CO_2. Doing so risks increasing demand (and therefore harvesting) in the context of collapsing land sinks and overextraction of biomass from the land sector in Europe, all the more that biochar represents the overwhelming majority of "durable" carbon removals delivered on voluntary markets today and is identified by analysts as the only technology currently able to scale (BioCCS at scale is only a promise at this stage).

Relying on the EU Renewable Energy Directive (RED) biomass sustainability criteria to avoid that carbon removals projects drive increased harvesting will not work. These criteria are a political compromise that has failed to ensure that bioenergy reduces emissions compared to fossil fuels (even when used instead of them), and has in particular driven additional forest logging. If "permanent removal credits" certified on the basis of such rules were to be used to offset emissions, they would not compensate for these emissions but rather add more GHG to the atmosphere.

BioCCS is very inefficient, expensive, and diverts scarce capital from investment in cleaner renewable energy sources (e.g. wind, solar, heat pumps), energy storage, energy efficiency as well as restoration of carbon absorbing ecosystems.

Massive economic and environmental gains could be obtained from a strategy involving cessation of subsidies to commercial scale forest bioenergy, including with BECCS. These savings could then be reallocated to incentivise matched funding for alternative means of addressing climate change: genuine renewables with energy storage (wind, solar, geothermal, heat pumps); energy demand reduction (insulation, recycling, fuel efficiency); and investment in conservation and restoration of carbon absorbing ecosystems.

This approach can deliver 15% of emission reductions needed for the EU Fit for 55 targets by 2030 (25% by 2050), €12 billion extra Gross Value Added annually by 2030 (€94 billion by 2050), 1.6 billion more higher tech jobs and more than €40 billion in energy costs saved annually by 2050.

The draft methodologies contradict several binding provisions of the CRCF Regulation, including requirements for scientific integrity, environmental safeguards, and full life-cycle accounting. As such, they would amount to "regulatory greenwashing".

The Regulation mandates that:

- carbon accounting use quantifications that are done in a "relevant, conservative, accurate, complete, consistent, transparent and comparable manner" and "in accordance with the latest scientific evidence available". The calculation of the "net" carbon effects must take into account all GHG emissions, including Indirect Land Use Change (ILUC).
- certified activities "shall do no significant harm to the environment".
- certification methodologies "promote the protection and restoration of biodiversity and ecosystems".

The draft methodologies do not comply with any of these requirements and thus will be vulnerable to legal challenge.

In view of the above, the signatories of this briefing call for the introduction of the following amendments and safeguards (the full list of demands is at the end of the position paper).

- As a pre-requisite, to ensure certified removals are additional to the existing land sink, and do not displace or reduce it, the biomass used for carbon removal projects must be sourced in countries whose national Land Use, Land Use Change and Forestry (LULUCF) sector accounts have not shown a decline in the land carbon sink (i.e. the rate of carbon sequestration by land ecosystems) over the past five years.
- Then, for countries whose biomass is eligible, much more robust life-cycle accounting is needed. All the relevant factors must be included so that the calculation reflects actual net emissions in the projects' whole life cycle (including emissions or changes in carbon stocks associated with harvesting, forgone sequestration, ILUC, processing, transport, combustion or emissions from pyrolysis and gasification, etc.) and demonstrates a net removal over a climate-relevant timescale.
- If the previous approach based on life-cycle accounting is not feasible, the methodologies must exclude the worst feedstocks from eligible biomass sources: primary woody biomass (meaning wood sourced directly from forests), dedicated crops, and any other biomass (including waste or residues) that can be used by local industries for bio-based products (enforcement of the cascading principle and waste hierarchy), or agricultural residues that cannot be removed without causing or worsening soil carbon depletion and erosion.
- In the case of biochar, soil carbon sampling must be required at periodic intervals on a project basis.
- Biodiversity measures ensuring the protection and restoration of ecosystems must be added to the certification methodologies, reflecting the legal requirements of the CRCF.

To assess the real-world consequences of the CRCF, much better monitoring and data are needed as part of a broader policy package:

- We urge EU Member States and the EU Parliament to adopt the most comprehensive possible version of the Forest Monitoring Law, building on the best available data from national forest inventories and satellite observation.
- Forests must be better protected against deforestation and forest degradation: we urge the EU Commission, Member States and the European Parliament to resist the irresponsible calls by the forestry industry and its allies to weaken the EU Regulation on deforestation-free products (EUDR) and the LULUCF targets, and implement them swiftly instead.

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TREE PER BABY BORN
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Introduction

At this acute stage of the climate and biodiversity crisis, it has never been more urgent to reduce GHG emissions, remove excess CO_2 from the atmosphere and restore ecosystems.

In late June 2025, the EU Commission is expected to propose two draft delegated acts under the Carbon Removal and Carbon Farming Regulation (CRCF). These texts, prepared by the Commission's DG CLIMA and consultants, will detail the carbon accounting methodologies to be used in particular for two types of 'permanent' carbon removal projects in the EU: Bioenergy with carbon capture and storage (BECCS or Bio-CCS[1]), and biochar.

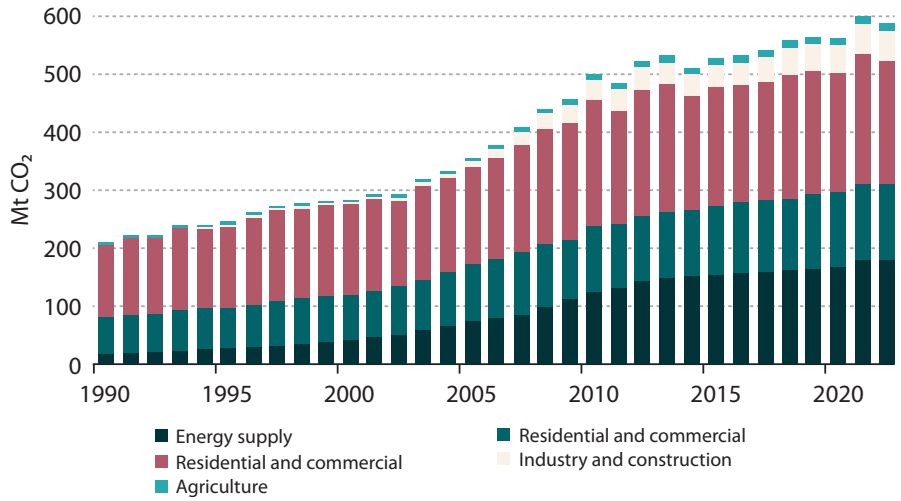
As of today, these two draft methodologies are not fit for purpose and must be revised before they are proposed by the European Commission and adopted by the EU.

I. Relying on the RED biomass criteria cannot ensure the credibility of certified permanent removals

Despite NGOs' and scientists' repeated warnings within DG CLIMA's Carbon Removals Expert Group, both methodologies for BioCCS and biochar still rely on the EU Renewable Energy Directive's biomass sustainability and greenhouse gas (GHG) criteria as the only environmental safeguard. These criteria, last revised in 2023, are the outcome of EU political compromises, not science.

It has become abundantly clear that the RED biomass sustainability criteria do not ensure that bioenergy reduces emissions compared to fossil fuels, and drive additional deforestation and forest degradation: Wood emits more CO_2 than fossil fuels per unit of energy released when burnt (IPCC, 2006), and direct CO_2 emissions from biomass

Figure 21 Annual CO_2 emissions from combustion of all types of biomass for energy purposes in different sectors in the EU-27



Source: EEA based on European Commission (2023)

Notes: CO_2 emissions from biomass combustion are reported as a Memo Item in national GHG inventories and are not included in national GHG emissions total

Figure 1: ESABCC (2025)

1 Bio-CCS is often used inter-changeably with BECCS but is a broader category that can include fermentation processes.

combustion have more than doubled since 2001 (EEA, 2023).

Many scientists, including the EU Commission's Joint Research Centre (JRC) and the European Academies of Science Advisory Council (EASAC), have warned that burning wood from forests can

CCS installation (BECCS) still emit more GHG per KWh on a lifecycle basis (including the climate impact of tree harvesting included in the LULUCF sector) than solar or wind (Trinomics, 2024). Recent research showed that the United Kingdom government's plans to use BECCS to help meet its climate goals will actually increase GHG emissions

EU Emission and Removals of the LULUCF sector by main land use category

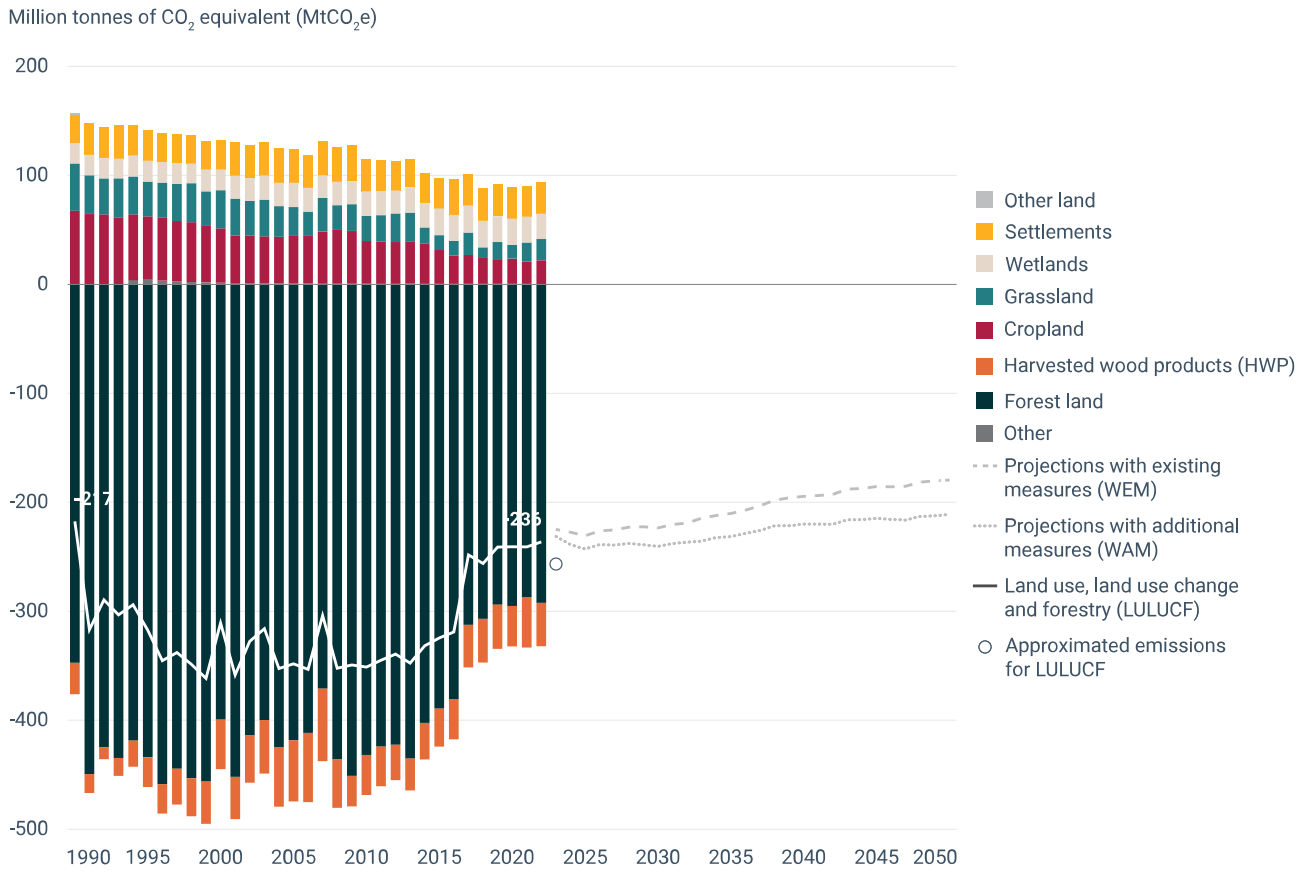


Figure 2: adapted from EEA (2024)

increase emissions for decades or even centuries compared to using fossil fuels to produce the same amount of heat and power. This is due to the long time needed for trees to grow back, the large carbon losses during the harvest, transport and manufacturing stages, and the lower combustion efficiency compared to fossil fuels (JRC 2020, Letter from scientists 2018, EASAC 2024).

As a result, and because their theoretical CO_2 capture rate cannot be expected to be higher than 90%, biomass power plants equipped with a

and require the additional logging of millions of hectares of forest (NRDC, 2024). Ethanol refineries, which use fermentation and not combustion, frequently have higher CO_2 emissions from energy generation for the refinery itself than the amount of CO_2 available for capture (Carbon Brief, 2016).

These additional GHG emissions will all the more worsen the climate crisis that the credits generated by BioCCS and biochar projects are expected to be bought by polluters to claim to compensate for their fossil emissions.

The RED sustainability criteria are badly designed and implemented: the voluntary certification schemes that operators can and widely do use for compliance, such as the Sustainable Biomass Program (SBP), do not provide accountability or even basic traceability (Counsell, 2024). The EU Court of Auditors already identified the main flaws of these schemes in 2016 (ECA, 2016), and various bioenergy fraud cases, previously undetected by certification schemes, keep being exposed in the media.

As the European Scientific Advisory Board on Climate Change (ESABCC) warned in its latest report on carbon removals, scaling up biomass-based technologies such as BioCCS while relying on the RED bioenergy rules can only lead to even more GHG emissions (including those linked to direct and indirect land use change), nitrous oxide (N2O) emissions from greater fertiliser use for agricultural feedstock, and a further degradation of ecosystems, undermining the carbon land sink and Member States' LULUCF targets.

II. BioCCS and biochar constitute the bulk of "durable removals" today but remove carbon from the biosphere, not the atmosphere

Most forms of BioCCS (such as BECCS) are about injecting liquefied compressed CO_2 from biomass combustion in deep geological formations, while biochar refers to the production and long-time storage (e.g., in soil/cement or in soils, where it can be used as soil amendment) of a form of charcoal produced from biomass pyrolysis.

According to market reports, biomass-based removals have constituted 99% of "durable" removals deals on voluntary carbon markets so far in 2025, with 93% coming from the considerably cheaper biochar. When it comes to actual carbon delivered, biochar is dominant and described by analysts as "the only method delivering at commercial scale" today.

When biochar is produced, depending on the pyrolysis method, only between 10 and 60% of the carbon contained in the biomass feedstock ends up in the char, with the remainder either emitted directly to the atmosphere or to other products, such as syngas and bio-oil, which are typically burned for energy (Amalina, 2022). Producing biochar therefore emits lots of CO_2, but the draft biochar methodology ignores this and only looks at the fraction of the carbon that is presumed to be the most resistant to degradation.

BioCCS and biochar sequester carbon extracted from the biosphere (biogenic carbon), not the atmosphere. The situation of BECCS and biochar is analogous to that of harvested wood products (HWP), which do not directly provide "removals" from the atmosphere (IPCC, 2019).[2]

Of course, plants sequester atmospheric carbon, but the extraction of biogenic carbon from the land sector has already contributed to about 30% of total CO_2 emissions for the past century and a half (Friedlingstein, 2024). The EU is already facing a large supply gap between sustainable supply and demand (Material Economics, 2021), visible in the current collapse of the land sink with logging driving more than 82% of forest disturbance in Europe (Seidl, 2024).

2 "The general term "removals" is defined in the Glossary of the 2006 IPCC Guidelines. In the context of HWP, when referring to CO_2 removals, it may be noted that HWP do not directly sequester carbon from the atmosphere [emphasis added]. 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 CO_2 originally sequestered by vegetation is transferred to the HWP pool, similarly to when it is transferred from the above ground biomass carbon pool to the litter and soil carbon pools in the AFOLU sector. The only difference is that transfers of carbon from vegetation to HWP are always the result of anthropogenic activity." (IPCC, 2019)

Demanding the reoval of more biomass from ecosystems will mostly result in a further depletion of the land sink rather than a reduction of atmospheric CO_2 levels. On the contrary, the Intergovernmental Panel on Climate Change (IPCC) found in its 2022 Assessment Report that reducing the conversion of forests and other ecosystems, and restoring ecosystems more broadly, had the largest potential for emissions reduction (IPCC, 2022).

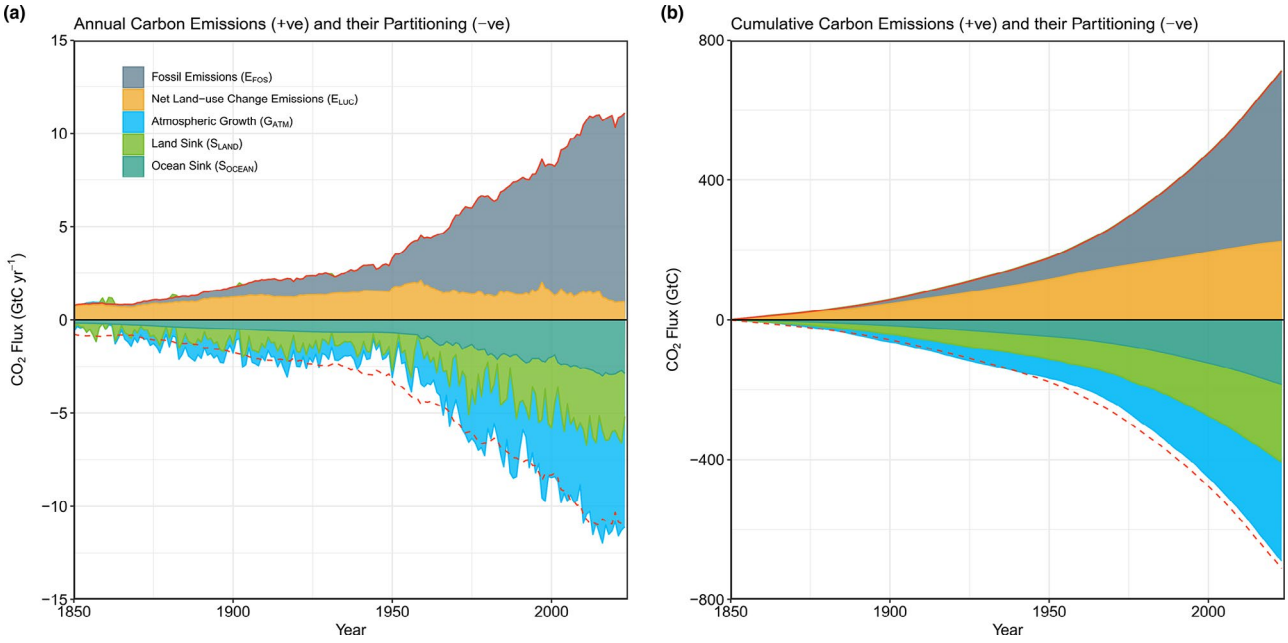


Figure 3: Net land use changes emissions - Cumulated net land use emissions amount to about 30% of total GHG emissions since 1850 Adapted from Friedlingstein et al (2024)

III. The proposed methodologies ignore impacts on the land sector and biochar effects on soil carbon levels

The fact that BioCCS and biochar use biogenic carbon makes monitoring their impact on land use and the land sink essential, but neither proposed accounting methodologies factor in the impact of these activities on the land sector: land sink depletion, forgone sequestration, ILUC, N2O emissions from fertilisers, demand displacement effects are still missing. This reproduces the problems caused by the EU RED accounting approach of counting these emissions in the land sector and then as zero in the energy sector, which has done so much to incentivise energy companies to burn biomass in the absence of equally robust incentives for Member States to preserve their land sink in the LULUCF Regulation.

Moreover, the proposed biochar accounting methodology only relies on modelling and permanence assumptions rather than in situ testing, despite the considerable uncertainties and lack of knowledge around the interactions between the biochar and the soil it is applied to, and the variability of the outcomes (Rasul, 2022) (Nkoh Nkoh, 2021). If the carbon contained in the certified biochar is re-emitted to the atmosphere, the methodology will simply fail to detect it.

Given these levels of uncertainty and variability, the current DG CLIMA proposal to classify biochar, the cheapest and ultra-dominant "durable" removal activity on voluntary markets today, as a permanent removals technology, is a dangerous bet, unscientific, and in breach of the precautionary principle.

IV. Why push more expensive, less efficient energy options on the EU economy?

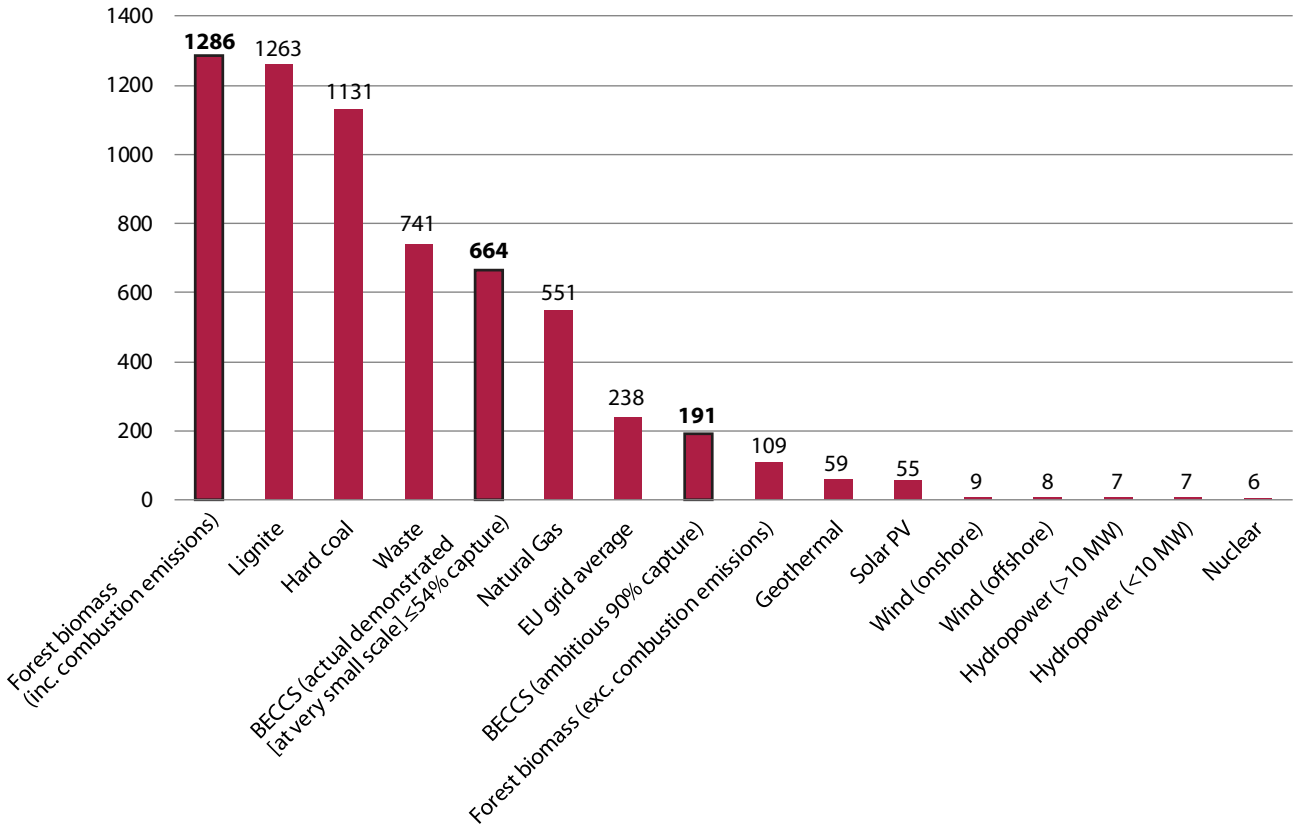
A recent report from Trinomics Consultants, energy advisors to the European Commission, found massive economic and environmental gains from a strategy involving cessation of subsidies to commercial scale forest bioenergy, including with BECCS. These savings could then be reallocated to incentivise matched funding for alternative means of addressing climate change: genuine renewables with energy storage (wind, solar, geothermal, heat pumps); energy demand reduction (insulation, recycling, fuel efficiency); and investment in conservation and restoration of carbon absorbing ecosystems.

This approach can deliver 15% of emission reductions needed for the EU Fit for 55 targets by 2030 (25% by 2050), €12 billion extra Gross Value Added annually by 2030 (€94 billion by 2050), 1.6 billion more higher tech jobs and more than €40 billion in energy costs saved annually by 2050 (Trinomics 2024).

By contrast, BECCS technology is largely unproven at scale and hugely expensive. For example, a mere 0.8% reduction of Sweden's annual wood harvest would sequester as much CO_2 this year from the air as the flagship Stockholm Exergi BECCS project promises to remove between 2028 and 2038 from forests (Fern, 2024). This would be achieved at a minuscule fraction of the cost, and with several co-benefits.

Pushing further bioenergy deployment, with or without CCS, will significantly compete with non-emissive renewables, energy efficiency and energy conservation measures. It will undermine the economic competitiveness agenda by increasing energy costs and distorting markets, penalising considerably more efficient biomass uses such as wood-based insulation (Schulte, 2025).

Total lifecycle emissions of different energy technologies in the EU [Grams of CO_2 equivalent per kilowatt hour], gCO_2e/kWh



Source: Trinomics 2024

V. The proposed rules ignore many legal requirements in the CRCF Regulation, and amount to "regulatory greenwashing"

The CRCF Regulation mandates that certified permanent removal activities "shall do no significant harm to the environment", and that relevant certification methodologies "promote the protection and restoration of biodiversity and ecosystems". Apart from a reference to the inadequate RED III rules, this dimension is currently absent from the proposed certification methodologies for BioCCS and biochar.

The CRCF Regulation mandates that the releases of "biogenic carbon" are accounted for. The legal text requires calculation of "net" carbon effects (Article 4), taking into account all GHG-associated emissions, including ILUC (Article 4.1.c and 4.5.c). It requires that carbon accounting uses quantifications that are done in a "relevant, conservative, accurate, complete, consistent, transparent and comparable manner" and "in accordance with the latest scientific evidence available" (Article 4.7).

The Regulation also requires that a carbon removal starts with an "anthropogenic removal" prior to its "durable storage" (Article 2.1), which means that simply harvesting trees that were growing anyway cannot constitute a removal, and that prior land-use change when using agricultural biomass or wood from industrial tree plantations must also be accounted for. The biomass sustainability and GHG criteria defined by the RED, a political compromise, do not meet this standard. As a consequence, the draft methodologies for BioCCS and biochar do not meet it either. By treating the mere shifting of any amount of carbon from trees or crops to other uses as net removals, these methodologies are not compatible with IPCC emission reporting guidance (Booth, 2025) and certainly do not reflect the latest scientific evidence available and the precautionary principle. Therefore, the adoption of such methodologies by the EU Commission would amount to "regulatory greenwashing".

Recommendations: credible climate action demands credible carbon accounting and policy integrity

Adopting the current draft methodologies for BioCCS and biochar would represent a massive waste of scarce capital from taxpayers and consumers, while making climate change worse.

At a time when climate denying forces are on the rise, the last thing the EU's climate action needs is further damage to its credibility and cost-effectiveness.

The signatories recommend that the EU include the following safeguards in the Bio-CCS and biochar methodologies, and provide enabling conditions to protect land ecosystems:

- As a pre-requisite, to ensure certified removals are additional to the existing land sink, and do not displace or reduce it, the biomass used for carbon removal projects must be sourced in countries whose national LULUCF sector accounts have not showed a decline in the land carbon sink over the past five years.
- Then, for countries whose biomass is eligible, much more robust life-cycle accounting is needed, in line with 2019 IPCC guidance reminding that transfering forest carbon to other locations of storage does not represent a "removal" of CO_2 from the atmosphere. All the relevant factors must be included so that the calculation reflects actual net emissions in the projects' whole life cycle (harvesting, forgone sequestration, processing, transport, combustion or emissions from pyrolysis and gasification, etc.) and demonstrates a net removal over a climate-relevant timescale.
- If the previous approach based on life-cycle accounting is not feasible, the methodologies must exclude the worst feedstocks from eligible biomass sources: primary woody biomass (meaning wood sourced directly from forests), dedicated crops, and any other biomass (for example secondary waste or residues) that can be used by local industries for bio-based products (enforcement of the cascading principle and waste hierarchy), or agricultural residues that cannot be removed without causing or worsening soil carbon depletion and erosion.
- In the case of biochar, soil carbon sampling must be required at periodic intervals on a project basis.
- Biodiversity measures ensuring the protection and restoration of ecosystems must be added to the certification methodologies, reflecting the legal requirements of the CRCF Regulation.

To assess the real-world consequences of the CRCF, much better monitoring and data are needed as part of a broader policy package:

- We urge EU Member States and the EU Parliament to adopt the most comprehensive possible version of the Forest Monitoring Law, building on the best available data from national forest inventories and satellite observation.
- Forests must be better protected against deforestation and forest degradation: we urge the EU Commission, Member States and the European Parliament to resist the irresponsible calls by the forestry industry and its allies to weaken the EU Regulation on deforestation-free products (EUDR) and the LULUCF targets, and implement them swiftly instead.

SIGNATORIES

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BirdLife Europe and Central Asia

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Earth Ethics, Inc.

Global Missions International (GLOMINT)

Centre for Climate Safety

AbibiNsroma Foundation

Ei polteta tulevaisuutta

Leefmilieu

Dogwood Alliance

Association of Voluntary Actions for Society (AVAS)

Association for Farmers Rights Defense, AFRD

CESTA AT El Salvador

Climate Communications Coalition

BirdLife Sverige

Mighty Earth

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Natuur & Milieu

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Aalem for Orphan and Vulnerable Children, Inc.

Association For Promotion Sustainable Development

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Colectivo VientoSur

Foodrise

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