Feedback on the Draft Methodology for Calculation of GHG emission avoidance

Creating a robust methodology for estimating GHG mitigation will play a crucial role in the development of low-carbon innovation and climate change mitigation within the EU ETS sectors. Hence, strengthening the methodology for the Calculation of GHG emission mitigation on a scientific basis is a crucial piece of the climate impact of the Innovation fund.

As was re-emphasised at the workshop, the Innovation Fund aims to support "innovative" or "breakthrough" techniques, so it is expected that projects would go beyond 'state of the art' and the relevant EU-ETS benchmark performances, pursuant to Article 11(1) of the delegated act. The methodology shall therefore be fully coherent to the zero-pollution agenda pursued within the new EU Green Deal. Those elements beyond GHG reduction have not yet been fully developed.

Strengths of the draft methodology

The current draft methodology has several robust environmental arguments which should retain their firm footing in the document.

RED II: RES additionality and carbon intensity for electricity calculation *(page 10)*

Due to the current RES targets and efforts in greening the power system, it is important to retain a principle of additionality for large, industrial projects which could potentially use and maintain base load demand for local, potentially non-RES electricity sources. Retaining the principle of additionality or in other cases, calculating realistic emissions from the grid, will ensure that the usage of RES in other sectors is not hindered and the power sector transformation does not come to a halt. Relying on future projections, particularly for projects within the 10-year timeframe is problematic. This holds not only for electricity, but also for e.g. recycling mechanisms and similar technologies which are not close to large-scale deployment.

Avoiding double counting and double benefit from both Innovation fund and RED II *(page 6)*

The emission reductions of projects financed by the Innovation fund should not be claimed and/or financed twice. The current document makes an important point by excluding any type of double counting. Overall, the draft rightly points out that the IF should not compete, but compliment other legislation and environmental and climate goals (e.g. circularity and recycling measures).

Permanent storage of CO_2 *(page 6)*

Distinguishing between projects which lead to long-term storage (centuries[1],[2]) of CO_2 rather than temporary storage is beneficial, as it recognises the emission of CO_2 upon the use of the product (e.g. fuel). This argument could be strengthened further by including other temporary products which also do not lead to permanent CO_2 storage and therefore do not mitigate the CO_2 used in their production process (e.g. chemicals, plastics). Further, the downstream impacts where enhanced oil recovery takes place is to be discounted from the emissions savings (that includes well to wheel emissions from that EOR fraction).

Using more specific methodology for lifecycle assessment instead of relying entirely on broad mechanisms such as the ISO 14040/44 *(presentation)*

To mitigate the adverse effects on other climate policies (e.g. circular economy and waste prevention targets) and ensure proper interpretation of the methodology, public policy LCAs should not leave room for creative accounting. Building on broader accounting systems such as the ISO 14040/44 instead of using them as they are is commendable.

Overall, we support the position of the Commission to reward the projects with the deepest cuts (compared to the best scenarios) in GHG emissions that are necessary to our efforts to mitigate the effects of climate change. Other environmental co-benefits need to be assessed as well.

Potential weaknesses of the draft methodology: recommendations

The following paragraphs focus on specific issues which could be refined in the draft methodologies for estimated GHG savings for the Innovation fund.

Choosing the right, ambitious reference scenario is key to achieving better climate performance

Setting an ambitious reference case will avoid comparison to the worst performers to achieve a higher delta in emissions.

In addition to setting an ambitious reference scenario, the methodology should not include GHG avoidance which assumes that the product or project substitutes a worse solution somewhere else along the value chain. 'CO_2 avoidance' can be interpreted to assume that one product allegedly avoids GHG emissions elsewhere in the economy without significant proof.[3] This risk should be mitigated within the methodology.

A given technology does not automatically substitute the 'reference' case (e.g. synthetic diesel substituting conventional diesel or CCU plastic substituting fossil virgin plastic). Even in the case of agro(bio)-fuels, recycled carbon fuels and some CCU fuels, incentivising those fuels in practice means further lock-in of internal combustion engines and liquid fuels infrastructure; counting emission reductions that do not happen in reality or that would favour existing liquid fuel infrastructure is

[1] Ramirez et al. 2019, Life Cycle Assessment for Carbon Capture and Utilisation, presented 9th July 2019.

[2] Levasseur et al. 2010, Considering Time in LCA: Dynamic LCA and Its Application to Global Warming Impact Assessments, https://pubs.acs.org/doi/pdf/10.1021/es9030003

[3] https://network.bellona.org/content/uploads/sites/3/2019/11/Bellona_CO2-AVOIDANCE-IN-THE-EU-ETS_KEEPING-BUSINESS-AS-USUAL_10_2019.pdf

problematic. Irrespective of the previous point, using the agro(bio)- fuel in a CHP would be more efficient use than in cars, especially if running on internal combustion engines rather using that agro(bio)fuel in the CHP providing electricity for trains / heat for district heating.

In some cases, the assumption of direct substitution is not backed by scientific evidence. For instance, in cases where the 'product' competes on a global market, the 'project' might not achieve that direct substitution of its fossil counterpart. When this substitution effect is not directly proven on a case-by-case basis, it should not be counted as a reduction. The reduction should be counted either when the CO_2 emissions are directly reduced or when it is permanently stored.

GHGs 'in the atmosphere' should not be equal to GHGs 'about to enter the atmosphere'

In order to preserve a distinction between fossil, additional CO_2 emitted to the atmosphere and atmospheric CO_2, the text on the origin of the carbon source for certain products could be refined. To avoid misinterpretation and ensure the reduction of fossil emissions, fossil flows of GHGs into the atmosphere should be distinguished from stocks of GHGs already in the atmosphere. To ensure that this distinction is made, we suggest the following change in wording:

Original text	Recommendation	Justification
It is implicit in the "project – reference" methodology that If additional CO_2, **that was either in the atmosphere or about to enter the atmosphere,** is captured in an IF process and incorporated into a product	It is implicit in the "project – reference" methodology that If additional CO_2, ~~**that was either in the atmosphere or about to enter the atmosphere,**~~ is captured in an IF process and incorporated into a product	Treating atmospheric CO_2 that is already in the atmosphere in the same way as fossil CO_2 that is produced at a point source could remove incentives for emission reductions. Also, it could influence definitions and cause confusion regarding Carbon Dioxide Removal (CDR) / Negative Emissions Technologies (NETs). Such techniques rely on an unambiguous definition of atmospheric CO_2 and atmospheric air capture of CO_2 to achieve CDR (a net and permanent removal of atmospheric CO_2 from the climate system). The suggested change is already compatible with the CCS section of the methodology, where fossil CO_2 is not compared to atmospheric CO_2.
the captured CO_2 is accounted as a **negative emission** in the emissions calculation of the project.	the captured CO_2 is accounted as a ~~negative emission~~ emission reduction in the emissions calculation of the project.	As it stands, it could be inferred from the text that the capture of CO_2 equals negative emissions (carbon direct removal). Misinterpretation of this term could have adverse effects on the future development of the definition of carbon removal[4]. Instead,

[4] Tanzer and Ramirez (2019) define the minimum qualifications for negative emissions as following: ''1. physical greenhouse gases are removed from the atmosphere, 2. the removed gases are stored out of the atmosphere in a manner intended to be permanent, 3. upstream and downstream GHG emissions associated with the removal and storage process are comprehensively estimated and included, 4. the total quantity of atmospheric greenhouse gases removed and permanently stored is greater than the total quantity of greenhouse gases emitted to the atmosphere.''

		the text could replace the term 'negative emission' with 'emission reduction' to avoid conflating the two terms.

'Rigid' wastes should still be counted as full-carbon, despite being diverted from their original use

Similar to the previous point on CO_2 emissions, at times the draft document assumes that gaseous and solid fossil wastes would be e.g. flared, burned and unused. By assuming the worst reference case, the IF could support projects which are not the best performing in the system (the worse the reference case, the larger the Δ in emissions). In order to reach the climate goals of the EU, both must be mitigated in the first place – calling them carbon neutral or low-carbon could disincentivise climate action in those sectors.

In addition, the definition of "waste" could be refined further in the document. The conversion of waste for fuel production is assumed to be "recycling" whilst it is energy recovery (page 9). Separate waste collection obligations are set for different waste streams such as (biowaste), Article 3(3) of RED II does not allow support to waste incineration if those requirements are not complied with. The prevention, recycling or minimisation of 'waste' incineration/conversion to fuels (energy recovery) is in all cases to be prioritised in the Innovation Fund criteria.

While using the waste would increase the efficiency of the system, it wouldn't result in significant emission reductions, particularly if this use was very brief (e.g. MSW fuels)[5]. Efficiency increase within a certain system does not necessarily equal emission reductions in the wider context.

Original text	Recommendation	Justification
For example, if its existing fate was incineration without energy recovery, the emissions from the incineration are avoided, and this means the emissions attributed to the waste are negative (i.e. avoiding the original fate saves emissions, so there is a CO_2 credit for its novel use)	For example, if its existing fate was incineration without energy recovery, the emissions from the incineration are avoided, and this means the emissions attributed to the waste ~~are negative~~ are discounted if the waste is reused, and upstream and downstream greenhouse gas emissions associated to its processing and product end-of-life are accounted for ~~(i.e. avoiding the original fate saves emissions, so there is a CO_2 credit for its novel use).~~	In order to verify the mitigation effect of the diversion of the waste, it's processing, usage and product end-of-life should be accounted for. Ultimately the use of fossil waste (e.g. plastics) could lead to a net increase in CO_2 stocks in the atmosphere, so these diverting carbon flows should be accounted for.
For example, if a stream of industrial off-gas is diverted from a simple fate such as flaring, flaring and release of the CO_2 to the atmosphere, the emission attributed to that input is negative; equal to the existing CO_2 release.	For example, if a stream of industrial off-gas is diverted from a simple fate such as flaring, flaring and release of the CO_2 to the atmosphere, the emission attributed to that input is discounted ~~negative~~; equal to the existing CO_2	The full mitigation of these gases can only be counted when the CO_2 is stored out of the atmosphere in a manner which is intended to be permanent.

[5] https://rethinkplasticalliance.eu/news/a-lifecycle-assessment-guide-for-plastic-fuels/

	release, only if the CO_2 is permanently isolated from the atmosphere.	

Using a static situation in the waste sector as a baseline scenario may be problematic in the context of defining effective use of public funds like the IF. Instead of assuming that the waste will be produced and burned indefinitely, the reference case should be based on an alternative use of the same public resources (e.g. other decarbonisation measures).

Regardless of some wastes being potentially 'rigid' as defined in the document, that doesn't make them any less carbon intensive. Elasticity of supply might affect the scale, but it doesn't necessarily signify how carbon intensive a material is.

Depending on what the reference scenario is, the input can be either rigid or elastic. For instance, if the reference case is business as usual, fossil resources and their wastes become elastic. Even though this is not the intention of the document, precautions to avoid such interpretations might be beneficial.

Just as plastics could be diverted from mechanical recycling, GHG emissions from industry can be diverted from mitigation measures. The draft document should ultimately incentivise the best possible scenario, not the lesser of two evils. This is another reason to compare the projects against ambitious reference scenarios rather than the worst outcomes (e.g. flaring and release of CO_2).

More information:

- https://network.bellona.org/content/uploads/sites/3/2019/11/Bellona_CO2-AVOIDANCE-IN-THE-EU-ETS_KEEPING-BUSINESS-AS-USUAL_10_2019.pdf
- https://rethinkplasticalliance.eu/news/a-lifecycle-assessment-guide-for-plastic-fuels/

Accounting for temporary carbon capture and use: Allocation to the point source

The reuse of CO_2 has a theoretical potential of emission reductions of 50%[6] compared to the reference scenario when it is not permanently stored. Avoiding the 'original fate' of the emission (reference case) and 'diverting it from its original use', particularly in case of production of products with short lifetimes, should be treated as shifting emissions to a different sector[7], not as an emission reduction. In order to avoid the dispersion of responsibility for the emission outside the EU ETS and difficult accounting for the individual products on large markets CCU targets, the emissions should be allocated to the point source.

Original text and terms	Recommendation for clarification
However, to avoid double counting under different legislations, if the GHG benefit for capturing the CO_2 is already claimed under another legal provision (such as ETS or revised Renewable Energy Directive5 (REDII)), the CO2 credit cannot be claimed for the IF project unless the benefit under the other legal	The intention of the draft document to avoid double counting is a valuable addition to the document. As the draft document recommends, the responsibility for the CO_2 should be clearly allocated.

[6] Abanades et al. 2017, On the climate change mitigation potential of CO_2 conversion to fuels, DOI: 10.1039/c7ee02819a

[7] https://mobil.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/WWF-Germany-CCU-Position-Paper-engl.pdf

provision is surrendered. This is to ensure that the user of the CO2 gets the credit for its capture, not the installation that captures it.	
To avoid double counting where a fuel is made incorporating that carbon, no adjustment is made to its emissions when combusted in use.	Clarification on the second statement (''no adjustment is made to its emissions when combusted in use'') would be necessary to refine the allocation of liability for the emission. The document needs to make it very clear that both the capture site and the fuel user cannot receive credits for any potential emission reductions.
	To cover all products which utilise CO_2 but do not result in its permanent storage, this statement could be expanded to include other CCU non-permanent products. These could be defined as products which use CO_2 in a manner not intended to be permanent.

Full credit should only be given to the emitter when the CO_2 is either permanently stored or mitigated by a different process. As the draft document rightly points out, recognising and preventing the possibility of double counting in the case of e.g. CCU fuels is an important measure.

Key criteria for Innovation Fund should be fully reflected in the methodology

The delegated act on the operation of the Innovation Fund sets out a number of key criteria as to its operational objectives and allocation criteria. The following aspects are highlighted:

a. Supporting projects that are "highly innovative" technologies, processes or products, that [..] have a significant potential to reduce GHG emissions"
b. Effectiveness in GHG avoidance potential compared to the EU ETS benchmarks
c. Degree of innovation compared to the state of the art.
d. Cost efficiency

Those key criteria are cumulative and need to be fully reflected in the methodology. Below are the main areas where improvements could be made:

- Criterion a and b imply that the baseline performance assumed is set to the EU ETS benchmark level; **near zero emissions processes, or processes with a roadmap to near zero emissions should be prioritised over interventions with continued net emissions to the atmosphere and the methodology should reflect this in a decision- tree/rating scheme.**
- Criterion c implies a link to the relevant 'Union Standards" concept under EU State aid rules for energy and environment and the EU BAT concept / BREFs adopted under the Industrial Emissions Directive (2010/75/EU) with the integrated approach on high general level of environmental protection. State of the art performance is reflected within the BAT-Conclusions set for new installations. Any project should therefore assume in its baseline scenario an "as if" full compliance scenario with the "new plants" standards set for the relevant plant e.g. energy efficiency performance levels or emission levels associated with the use of BAT for the other air pollutants. BATs are already considered as established, economically and technically viable standards, so in this sense are not "innovative techniques" (criterion a). The BAT concept is based on the integrated approach on environmental impacts,

such as relevant environmental quality standards (Art 18 of the IED). Projects under the IF should demonstrate in what way these are (highly) innovative and effective and compatible to the objectives of those environmental quality standards.

- Added value/incentive effect test: the method does not yet provide answers on this fundamental criterion.
- All reference scenarios should reflect compatibility with decarbonisation targets such as a full implementation of RES. This consideration comes into play when assessing "equivalent function". In the example of energy generation (electricity/heat) there are many ways to deliver that "equivalent function". The methodology should rule out certain options, for instance coal/lignite/peat combustion, because it is not compatible with the wider zero pollution agenda. Applying this concept to products becomes more complex.

Process – reference: ETS benchmarks

Referring to the ETS benchmarks, which are set at the average 10% top performers in a given sector, potentially presents several shortcomings:

- As currently set in the EU ETS Directive, ETS benchmarks serve to define levels of free emission allowances to sectors deemed at risk of 'carbon leakage', but are inadequate to deliver on 2050 carbon neutrality. Any project that does not represent a significant improvement compared to the benchmark in the respective sector will not be transformative and should therefore not be eligible for funding.
- Given the current yearly efficiency improvements rates, which are set between 0.2 % and 1.6% (art. 10a ETS Directive), referring to the ETS benchmark in 2050 is not compatible with the climate goals. To innovate, the Innovation fund needs to support clean breakthrough technologies with acknowledgement that innovated processes need to be compatible with zero emissions.

Original text	**Recommendations**
In the case of an innovative project to modify an existing plant, the project scenario contains the modified plant and the reference scenario contains the unmodified plant provided that the modified plant has emissions less than or equal to an installation reaching the ETS benchmark.	Assume full implementation of relevant EU environmental protection objectives and Union Standards (state of the art performance set for "new" installations), RES and EE targets or policies, as well as the adapted EU ETS benchmarks to 2050 (including an improvement rate of 1,6% per year calculated to delivery date of the project)
In the case of an innovative project for a new plant falling into an ETS category, the reference plant will be a plant defined able to meet the ETS benchmark.	In the case of an innovative project for a new plant falling into an ETS category, the reference plant will be a plant defined able to meet the ETS benchmark and be in line with the already most up to date BAT set for new installations or emerging techniques.
No explicit exclusion of fossil combustion for electricity generation	The baseline reference case for electricity generation shall not exceed carbon intensity of 230g/KWh. This reflects the state of the art CCGT CHP (61,1% net electrical efficiency,

	<230g/KWh). Reference scenarios and Innovation Fund investments should exclude use of lignite, coal and peat [fossil] combustion for electricity generation, including with CCS.
Industrial off-gases as input (page 7) Some examples claim that coke oven gas is otherwise flared if not used in downstream processed. Heat recovery is portrayed as a novel technique	Flaring is prohibited and is only done in emergency situations. Therefore, flaring should never be used as a reference case. Heat recovery is a standard technique (state of the art). It is to be considered as a baseline situation.
Concept of rigid / elastic inputs	The definition of rigid inputs could be changed to include the final climate impact of the waste: ''If the input has a fixed supply, then it is considered "rigid": it can only be supplied to a new project by diverting it from another use. Its emissions intensity then considers the impact of diverting it from its existing use. In addition, its emissions intensity should consider its embedded emissions (e.g. plastics), final fate and impact on the climate. Also, in the example of waste incineration, the proportion /amount and calorific values of input fuels/waste can change. A change on those elements affects wider pollution profile and impacts.
The methodology rightly indicates that at times of shortage of RES supply, using energy storage for grid-balancing functions could save far more emissions than using that stored energy to produce electro fuels (page 11). In the example of section 2.4.3 it is clear that an electrolyser charged with electricity from coal/gas fired power plants does not lead to any GHG reductions compared to conventional hydrogen production process.	Based on the "equivalent function" concept: • Establish a decision tree mechanism to ensure that the most effective emission reduction is ensured (in first example provide premium to grid balancing) • Clarify that storage technologies can only lead to GHG reductions if they are charged by non-combustion type renewable energy sources.

The projects should aim for more than the current goal of a 75% reduction in addition to the CO_2 reduction when compared to the selected reference case. The projects should strive for compatibility with climate neutrality and lock-in in technologies which are sub-optimal should be avoided. Total emissions to the atmosphere per tonne of product products should also be listed.

Recommendations for clarification of 'GHG avoidance'

The concept of GHG avoidance should be clearly defined. Some stakeholders might interpret it not as climate change mitigation, but as substitution of products. This can result in estimates which do not refer to an inventory of actual physical emissions.[8,9]

Conclusion

Where possible, a detailed approach for the calculation of GHGs should be used. Simplifications might be practical for the innovation fund, but would have adverse effects on large-scale deployment and consequently, meeting climate change mitigation targets.

Strengths – to be preserved in the document
Electricity requirements: additionality of RES and physical and temporal connection to the project
Avoiding double counting
Avoiding a loose LCA subject to gaming
Intended complementarity with other policies (e.g. Circularity measures)

Recommendations – to be refined in the document
Setting an ambitious reference case: avoiding comparison to the worst performers to achieve higher delta in emissions. Overall, the IF should reward the projects with the deepest cuts (compared to the best scenarios) in GHG emissions and avoid comparison to counterfactuals which would not be based on theoretical reductions somewhere else along the value chain.
Clearly allocating responsibility for the emission in order to avoid double counting
Count the carbon content and embedded emissions of rigid wastes and their subsequent uses, despite their 'limited supply'
Distinguish between atmospheric and fossil CO_2 to avoid conflating mitigation with carbon direct removal

For more information, contact:

Christian Schaible
Policy Manager - Industrial Production

European Environmental Bureau
Rue des Deux Eglises 14-16, B-1000 Brussels
Tel: +32 2 289 10 90
Email: christian.schaible@eeb.org

Agnese Ruggiero
Policy Officer
Carbon Market Watch

Rue d'Albanie 117, B-1060 Brussels, Belgium
Tel: +32 2 335 36 66 |
Mobile: +32 472 19 01 42
Email: agnese.ruggiero@carbonmarketwatch.org

Ana Šerdoner
Policy & Project Advisor

Bellona Europa aisbl
Rue d'Egmont 15
1000 Brussels
Email: ana@bellona.org
Mobile: +32 (0)48 779 8419
Skype: anaserdoner

[8] Ramirez 2018, Key challenges and expectations faced by CO2 utilization concepts from a life cycle perspective, available at: https://www.icef-forum.org/pdf2018/program/cs2/Presentation_Andrea_Ramirez_181016.pdf

[9] https://bellona.org/publication/keeping-business-as-usual-co2-avoidance-in-the-eu-ets-monitoring-and-reporting-regulation-2