



Feedback on Information Note for further work on removals under Article 6.4 (A6.4-SB005-A02)

The Article 6.4 mechanism Supervisory Body is seeking inputs regarding removal activities under the Article 6.4 mechanism.

Introduction

The aviation industry is committed to address its environmental impact. In 2008, it became the first industry to adopt a global, sector-wide climate action goal. In October 2021, the global aviation industry took its climate commitment one step further by declaring that it will achieve net-zero carbon emissions by 2050, supported by accelerated efficiency measures, energy transition and innovation across the aviation sector and in partnership with Governments around the world.

Governments also confirmed their support for net zero carbon emissions by 2050 for aviation by adopting a similar goal during the 41st Assembly of the International Civil Aviation Organization in October 2022. Net zero carbon emissions by 2050 is significant as it supports the Paris Agreement goal to limit global warming to 1.5 degrees, compared to pre-industrial levels. Scientists agree that this would greatly reduce the severity of climate change damage.

Achieving net zero carbon emissions by 2050 for the aviation industry requires a combination of different decarbonization levers. IATA recently launched Net Zero roadmaps outline the different in-sector levers of action including aircraft technology, sustainable aviation fuel, hydrogen, and electric propulsion but also the role of out-of-sector solutions including carbon offsets and carbon capture in meeting the industry's net zero by 2050 goal.¹ Carbon capture, particularly direct air capture, is a vital component of long-term carbon removal and is a key component for allowing the world to meet the Paris Agreement goals.

Cross-cutting questions:

1. Discuss the role of removals activities and this guidance in supporting the aim of balancing emissions with removals through mid-century

The need for carbon removals to reach net-zero GHG emissions at global level is a science-based fact. The Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA) both clearly state that carbon removals, including technology-based removal solutions such as direct air capture and storage (DACCS), are required to achieve net-zero emissions by 2050 at global level, and highlight their key contribution to neutralize residual emissions from hard-to-abate sectors, including aviation.

Carbon removals, and in particular technology-based removals, will play a critical role in the decarbonization of aviation. First, by supporting in-sector measures aimed at avoiding or reducing emissions including through the use of captured CO₂ as a feedstock for sustainable aviation fuels.

Second, removals will support the balancing of aviation's residual emissions, estimated to range from about 200 to 950 Mt CO₂ in 2050 according to the scenarios of the ICAO Long-Term Aspirational Goal report.² Consequently, IATA estimates in its Energy and New Fuels Infrastructure Net Zero Roadmap that more than 700 million tonnes of CO₂ per year will need to be extracted from the atmosphere in 2050 with carbon capture technologies, either to produce sustainable aviation fuels or for permanent storage.³ Even if conventional aviation fuel was fully replaced by SAF by 2050, this SAF won't be fully carbon circular, so carbon removals will still be required to compensate for any residual emissions.

The operationalization and guidance on removal activities under Article 6.4 is expected to provide an international framework to trade carbon dioxide removals credits. Establishing such a framework will be instrumental in enabling the scale-up of carbon removal technologies, while guaranteeing environmental integrity. Ensuring that the framework includes technology-based removals will enable the necessary financial flows to scale-up promising technologies, so they can meet the demand required for meaningful impact on aviation decarbonization.

Questions on specific elements

C. Accounting for removals:

The considerations proposed below pertain specifically to removal activities relying on technological solutions such as direct air capture and storage (DACCS).

Technological removals should be explicitly included within UNFCCC frameworks for GHG accounting. Currently there is no specific accounting methodology for technology-based removals, so the contribution of the technology to meeting mitigation targets under the Paris Agreement remains unclear. Moreover, this uncertainty cascades down to national and sector-specific initiatives, where the lack of inclusion of carbon removal technologies in the IPCC Guidelines for National Greenhouse Gas Inventories is cited as a reason for its continued exclusion (example of Australian Emissions Reduction Fund which did not include DACCS). In parallel, where initiatives are being developed notably by the European Union, harmonization with UNFCCC accounting frameworks should be ensured as early as possible to reduce divergences between voluntary and compliance markets.

Alignment and harmonization with existing international approaches to emissions accounting, Measurement Reporting & Verification, and standards will be important. The aviation sector is global in nature. It therefore requires global policy and regulatory frameworks. This also applies to GHG emissions accounting methodologies. Harmonization can guarantee a level playing for the actors of the sector.

There is a need to further refine procedures and methodologies related to identification and mitigation of risks linked to reversals and leakages across carbon removal activities. The use of cradle to grave life-cycle assessments to account for activity boundaries and associated removal activity related emissions should support these assessments, with technology-based removal solutions already demonstrating low levels of risk for reversal or re-release of CO₂ and thus exhibiting high potential for quality of future credits generated by these technologies.

“Removals/negative emissions” and “avoided emissions” should be accounted for separately. To avoid double counting, further clarity is required from A6.4SB on the definition of removal credits and how they are distinct from avoidance credits. This would recognize the uses of captured CO₂ both for storage and its use as a feedstock with corresponding distinct environmental attributes.

On the one hand, benefits of a *removal* activity, namely the net negative carbon emissions it generates, should be accounted for in terms of the net removals that a carbon removal activity has generated in comparison to a baseline (assuming cradle to grave life cycle assessment conducted for the specific technology deployed). By comparison, a *reduction* in greenhouse gases resulting from the implementation of a removal activity ought to be accounted separately, for instance as a co-benefit of a removal activity to maintain definitional consistency between emissions reductions and removals.

In cases where the two interact, namely on the use of captured CO₂ as a feedstock (for example for sustainable aviation fuels), clarity is needed on how the two coexist under the Article 6.4 mechanism.

References

- [1] IATA, International Air Transport Association
Net Zero Roadmaps
<https://www.iata.org/en/programs/environment/roadmaps/>, 2023
- [2] ICAO, International Civil Aviation Organization
ICAO Environmental Report 2022 - Decarbonising Aviation in the IEA’s Net Zero Emissions by 2050 Scenario
https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2022/ENVReport2022_Art48.pdf, 2022
- [3] IATA, International Air Transport Association
Energy and New Fuels Infrastructure Roadmap,
<https://www.iata.org/contentassets/8d19e716636a47c184e7221c77563c93/energy-and-new-fuels-infrastructure-net-zero-roadmap.pdf>, 2023
- [4] IATA, International Air Transport Association
International Air Transport Association “Direct Air Capture (DAC) and Storage (DAC+S): Essential Components to Achieve Net Zero Carbon in Aviation”
<https://flyaware.iata.org/documents/direct-air-capture-and-storage-essential-components-to-achieve-net-zero-carbon-inaviation>, 2023.
- [5] ATAG, Air Action Transport Group
Waypoint 2050, second edition
https://aviationbenefits.org/media/167417/w2050_v2021_27sept_full.pdf, 2021.