



Net Zero 2050: Offsetting and Carbon Capture (Market-Based Measures)

Fact Sheet

Overview

The aviation industry's net-zero CO₂ emissions target is focused on delivering maximum reduction in emissions at source, through the use of sustainable aviation fuels (SAF), innovative new propulsion technologies, and other efficiency improvements (such as improvements to air traffic navigation).

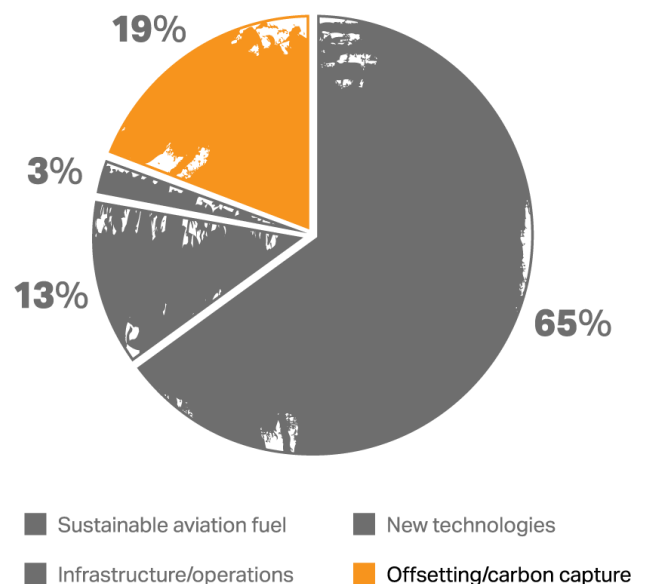
If it proves impossible to completely eliminate emissions at source, the industry is committed to mitigating the remaining emissions using market-based measures (MBMs), which includes the use of carbon dioxide removals (CDR) technologies. This fact sheet explains more about the different methods and technologies that can be used within MBMs. (For more on the existing Carbon Offsetting and Reduction Scheme for International Aviation program, see the dedicated [CORSA fact sheet](#)).

MBMs in practice

The use of MBMs to reach net zero CO₂ emissions in 2050 is expected to play a significant role (approximately addressing 19% of total CO₂ emissions in 2050 according to IATA's Net Zero Roadmaps). This is often done through the purchase of carbon credits, which are a tradeable certificate that represents the reduction or removal of one metric ton of CO₂ equivalent occurring outside of the company's value chain. Through the purchase of carbon credits, the aviation industry can claim CO₂ emissions reductions or removals occurring outside of their value chains in a practice popularly known by the term 'offsetting'. The aviation industry, particularly through its participation in CORSIA, subscribes to some key criteria to ensure that the carbon credits that they purchase correspond to robust and verifiable CO₂ mitigation outcomes:

- CO₂ reduction or removal credits must be 'additional' to business-as-usual activity. Credits must also represent a permanent reduction of GHG emissions that cannot be reversed.
- To quantify the greenhouse gas (GHG) reduction benefits from an offsetting project, a baseline must be determined to represent what would have happened if the project had not been implemented. Emissions reductions will need to be quantified using accurate measurements, valid protocols, and be audited.
- Procedures must be in place to track units and to avoid that an emissions reduction is counted more than once towards attaining climate change mitigation.
- Offsetting projects must comply with local, national, and international laws, and must have safeguards in place to manage environmental and social risks.

Contribution to achieving Net Zero Carbon in 2050



Offsets: Greenhouse gas (GHG) reductions

Credits can be generated from projects that verifiably reduce greenhouse gas emissions compared to an established baseline. GHG-reduction projects can take many forms. Some common categories include jurisdictional and nested reducing emissions from deforestation and forest degradation in developing countries (REDD+), implementing energy-efficiency measures for household cooking, and capturing landfill methane. Carbon reduction credits offer a way for buying entities, including airlines, to channel funding to projects that require it the most to reduce GHG emissions. With the operationalization of Article 6.2 of the Paris Agreement, there are also robust guidelines to ensure minimal risk of double-counting GHG mitigation outcomes between the Host Country and the airline.

Carbon credits, which are traded in international markets that aviation participates in, such as CORSIA, follow robust quality criteria as outlined in the previous section. The use of credits from these projects can bring impactful GHG mitigation outcomes, substantial economic, environmental, and societal co-benefits, and generate climate finance for the countries where these projects are located, which can then be allocated to further climate change mitigation and adaptation initiatives. REDD+ initiatives, for example, have resulted in an estimated reduction of over 14 billion tonnes of carbon dioxide over the past 10 years in 24 countries [\[source\]](#).

Offsets: Carbon dioxide removals (CDR)

Carbon dioxide removals (CDR) are a set of technologies, practices, and approaches that remove and sequester CO₂ from the atmosphere and durably store the carbon in geological, terrestrial or ocean reservoirs, or in products. CO₂ removed from CDR projects similarly generated credits which organizations like airlines can purchase to offset their GHG emissions. CDR differs from carbon reductions in that CDR leads to a net reduction in atmospheric CO₂ concentrations, while carbon reductions ensure that atmospheric CO₂ concentrations remain stable relative to a counterfactual scenario. Both are important parts of MBMs, and CDR is expected to become increasingly important over time as GHG reductions across sectors become increasingly technologically and economically infeasible. GHG emissions leftover after this point are expected to be counterbalanced by CDR.

CDR technologies can take many forms, each with its own unique mechanisms for removing and storing CO₂ from the atmosphere. Biologically based CDR methods, for example, use biological carbon sinks for CO₂ sequestration. While CDR as a whole is still a nascent industry, many biological-based CDR solutions are readily deployable today, such as afforestation and reforestation (AR) and biochar at relatively lower costs than other CDR solutions.

Other CDR solutions include those that use engineered processes, known as technological CDR, to capture and store CO₂. This includes, for example, technologies such as direct air carbon capture and storage (DACCS). Common DACCS technologies today uses large fans to draw in ambient air to pass through a filter, such as a chemical solvent and adsorbent, to yield a pure CO₂ stream that can be stored or utilized. These technologies are less technologically developed and highly costly today (up to USD 1000 per tonne of CO₂) [\[source\]](#) compared to biologically based CDR, but are expected to offer higher deployment potential in coming years. It is estimated that the deployment potential for DACCS could be between 5 to 40 GtCO₂ per year, much higher than AR or biochar, which is expected to reach mitigation potentials up to 10 and 6.6 GtCO₂ per year respectively¹.

For more information of the different types of CDR technologies, see the [IATA Facts publication on CDR Technologies](#)

¹ IPCC AR6 Chapter 12
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