



Aviation Carbon Offsetting

Guidelines for Voluntary Programs





Summary

These guidelines set out a systematic approach to establishing an offset program. The document is intended for use by airlines that wish to include offsetting as part of their overall efforts to reduce carbon dioxide emissions (CO₂).

The document will lay out the concept of carbon offsetting first. This will be followed a step-by-step approach to setting up and managing a carbon offset scheme, summarized in the table below. In the main sections, each step is explained along with relevant advice.

SECTION	STEP	MAIN TOPICS
00	Introduction	Outlining the concept Voluntary vs. mandatory offsetting
01	Role of Offsets	When to use offsets Identifying stakeholders What are potential risks
02	Scope of Offsets	What activities to offset Flight-related emissions
03	Regulations and Budget	Regulatory implications Review of cost implications Possible tax implications Maintenance and support
04	Offset Proposition	Offset functionality embedded in airline Booking process vs. "click away" Frequent Flyer Program Complete / partial offset
05	Offset Projects and Standards	Programmes and standards Type & Price of Project Customer preferences Registry arrangements
06	Program Management	Choosing the partners Internal responsibilities Managing the program
07	Setting up the System	Customer interface Carbon calculator Airline interface
08	Launch and Operations	Preparing for launch Audit and verification Feedback and Communications



Introduction

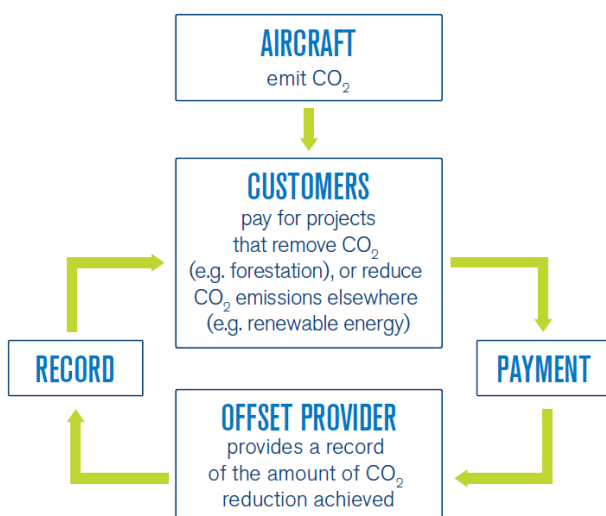
This document provides guidance to airlines that consider offering CO₂ offsetting to passengers as part of their overall climate action activities. By the time of writing, some 40 airlines are operating passenger offsetting programs, each with different characteristics. This section explains the nature of carbon offsets and the basic principles.

What are Carbon Offsets?

- In general terms, an offset is a compensating equivalent. As an activity, it can mean to balance, cancel out or neutralize.
- In the context of addressing climate change, offsetting is an action by companies or individuals to compensate for carbon emissions, in this case arising from their use of commercial aviation services. The offset can be equivalent in part or in whole to the associated emissions, by financing a reduction in emissions elsewhere.
- There are many ways to achieve CO₂ reductions with offsets, many of which bring other social, environmental, or economic benefits relevant to sustainable development. Significant differences exist between offset types.

How does Offsetting work?

In simple terms, when an activity like air travel produces CO₂ emissions, these emissions can be compensated – or offset – by preventing or reducing a similar amount of emission elsewhere. This compensation can be performed by the airline itself or by its passengers. Such offsets can be sourced from various types of project activities and can be purchased through specialized offset providers or carbon brokers. The buyer then receives a certificate or record from the seller providing details about the project and the amount of reduced CO₂ emissions. The diagram below illustrates this process:





Principles of Carbon Offsetting

In order to instil confidence in the purchase and use of carbon offsets and ensure quality of offset programs in general, a number of principles should be respected.

Additionality – A key requirement for an offset is that the CO₂ reduction or removal used as an offset is 'additional' to business-as-usual activity. Demonstrating additionality is complex, but a number of approaches have been used successfully to ensure the environmental integrity of offsets.

Complementarity – Voluntary offsetting should be considered as part of wider efforts to reduce emissions alongside other measures such as technological development and operational improvements. Offset programs will only be credible if coupled with serious efforts to minimize the company's CO₂ emissions first.

Verification – Records of aircraft CO₂ emissions from operations covered by the offset program must be maintained and be externally verified by an independent third-party entity.

Registration – CO₂ reductions from offset projects should be recorded and tracked through a central registry, with the amounts purchased progressively subtracted from the total determined for that particular project.

Traceability – The receipt issued to the customer should clearly indicate that the credit has been, or will be, retired as a result of the purchase and cannot be resold. A receipt may also indicate the type of project that was used to generate the offset, or the quality standard that the offset meets.

Guarantee – If an offset is sold where the purchased reduction in CO₂ will be achieved at some future date, then a guarantee that an alternative and equivalent offset will be made if the project fails should be provided. IATA suggests that preferably only offsets already achieved are included.

Voluntary vs. Mandatory Offsetting

The importance of making a clear distinction between airline mandatory offsetting requirements and voluntary passenger action such as voluntary offsets cannot be understated – in particular given the worldwide implementation of the ICAO Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)¹. That is a mandatory scheme set out to address the growth in emissions from international aviation which contains offsetting requirements for airlines. In addition to an airline's full suite of climate action measures, passengers can act as well and make a conscious decision to voluntarily invest in carbon offsets.

In summary, a mandatory scheme such as CORSIA is needed to address **carbon neutral growth of the aviation industry**, whereas voluntary offset schemes are targeted at passengers to reduce their **own footprint**. Airlines **cannot make any claims** for offsets that passengers have voluntarily invested in. They can also not use such offsets for frameworks like CORSIA. It will be of utmost importance that any information to customers make a clear distinction between passenger voluntary action and any other climate mitigation activities that are of mandatory nature (i.e., CORSIA), avoiding any confusion between the two.

¹ <https://www.iata.org/en/programs/environment/corsia/>



1. Role of Offsets

When to use Offsets?

Global aviation accounts for some 2% of man-made carbon emissions. In 2021, at the 77th IATA annual meeting, the industry committed to achieve net zero CO₂ emissions by 2050.²

Achieving net zero in aviation requires a lot of effort from both within the industry and also outside of it. Sustainable aviation fuels (SAF), offsetting, new technologies, infrastructure and operation improvements are especially crucial to achieving this goal. For more details on the net zero goal, see the IATA website: [Fly Net Zero](#).

The aviation industry is confident that technology, operations, and infrastructure measures will provide long-term solutions for aviation's sustainable growth. However, to complement these measures, and take actions with a more immediate effect, a customer-based offset program could be considered to reduce the net impact of flying by achieving equivalent carbon reductions from actions taken outside the aviation industry. Correspondingly, arguments supporting offsetting include:

- Increasingly, customers are looking for the opportunity to reduce the environmental impact of their flights. Offsetting is a positive action that can be taken immediately by customers to help mitigate aviation's impact on climate change.
- Through an offset program, customers can contribute directly to emissions reductions, and, at the same time, be informed about aviation's climate impact and associated mitigations measures.
- Customers can choose from a range of projects (e.g., reforestation, wind energy) that gives them a sense of empowerment and choice. Identification with specific projects can improve customer response, thus improving the credibility of the offset program.
- A well-organised offset program demonstrates a conscious and environmentally responsible attitude of the company running the program.
- It can lead to a better understanding of carbon markets, which is important for those airlines that may otherwise need it for regulatory compliance, e.g., CORSIA.

Who are the Stakeholders?

A number of groups have an interest in the success of offset programs. These stakeholders include the following:

- Governments are keen to see airlines take action to ensure their long-term position in a sustainable society.
- Airlines and their shareholders want their investment to be protected by appropriate programs and planning.
- Corporate customers will increasingly evaluate the 'need to fly' or move freight by air and the position individual airlines take on climate change, as well as the cost of offset programs.
- Non-governmental organizations will continue to push for responsible action by airlines.

² https://www.iata.org/contentassets/b3783d24c5834634af59148c718472bb/factsheet_netzeroresolution.pdf



- Employees will wish to be associated with companies that are environmentally responsible.
- Passengers will want to see 'value for money' and real emission reductions when they pay for an offset.
- Travel agents are increasingly looking to offer emission compensation for their customers.
- Corporate buyers are more actively engaged in compensating staff travel as part of their overall CSR strategy.
- Offset providers will wish to be part of a responsible and successful program.

What are the Potential Risks?

When developed properly, carbon offset programs can form a powerful addition to any strategy addressing aviation's climate change impact. However, airlines considering implementing a program should thoroughly examine any offset proposition before taking it up. There are a number of points that must be considered carefully, for example:

- With many organizations now offering offsets, it is essential to look 'behind the label' at the credentials of those involved and ensure the provider is financially sound. Specifically, airlines should beware of irresponsible marketing including:
 - Misleading calculation of carbon quantities
 - Lack of quality verification of carbon benefits
 - Possible double selling of credits
- When buying offsets that are yet to be achieved (e.g., primary carbon credits prior to issuance) there is a possibility that something could go wrong, and the offsets not being achieved.
- One should take care that customers are not asked to offset carbon emissions for which a reduction has already been accounted for. For example, if emissions from power utilities are covered under a cap-and-trade emissions trading program, the scope of the offset program should not include emissions associated with the use of electricity by the aircraft while on the ground.
- Offsets are seen by some commentators as an easy way to assuage individual or corporate guilt over CO₂ intensive activities. Some see offset programs as an 'easy way out', detracting from efforts to reduce CO₂ emissions at the source. Airlines should be prepared to address this type of criticism by explaining that offset programs are part of a larger emissions reduction strategy.
- The credibility of the program will be at risk if there is a low take-up within a reasonable time from launch. Promotion of the program through company communications channels such as websites and in-flight entertainment, as well as providing information and easy access to offsetting opportunities will encourage and facilitate take-up.
- Targets, progress reviews, customer feedback, and periodic refreshment of the program will further enhance credibility.



2. Scope of Offsets

What to Offset?

Aviation involves a range of activities that generate CO₂ emissions, including:

- Transport to and from airports
- Manufacturing of aircraft and components
- Maintenance of aircraft
- Ground handling operations
- Airport facilities including retail outlets
- Flight operations

The largest cause of aviation emissions is passenger flight operations. This document and the corresponding guidelines are aimed at this source. General guidance on reporting greenhouse gas emissions is available from sources such as the Global Reporting Initiative³, an organization that works with corporations to disclose their greenhouse gas emissions.

In determining the emissions to be offset, the program should cover all commercial flights involving passengers and collect the fuel use for those. Non-commercial flights, such as test flights and aircraft positioning, should be considered within internal corporate programs. The collection of fuel use per flight could be approached in five different ways according to the CORSIA SARPs, as described in the IATA CORSIA Handbook⁴:

- Method A: Fuel measurements after the completion of fuel uplifts (for the flight under consideration and for the subsequent flight) and the fuel uplift for the subsequent flight
- Method B: Fuel measurements at block-on times (preceding flight and flight under consideration) and the fuel uplift for the flight considered
- Block-off / block-on: Fuel consumed between block-off and block-on
- Fuel uplift: Fuel uplift before each flight, with appropriate adjustments for zero-uplift flights
- Fuel allocation with block-hours: Calculating average fuel burn ratio per aircraft type, typically over a year, and multiplying it with block hours for each flight

³ <https://www.globalreporting.org/>

⁴ <https://www.iata.org/contentassets/fb745460050c48089597a3ef1b9fe7a8/corsia-handbook.pdf>



3.Regulations and Budget

Fiscal Regulations

Airlines should seek guidance from tax authorities on whether offsets are taxable or not. Different tax regimes may apply to different types of offset providers such as limited companies and charities.

Offsets in Context

Budget

The customer pays for a CO₂ reduction related to the amount of air travel activity. The payment for the offset, generally made at the time of ticket purchase, is then channeled separately, possibly through a contracting organization. Normally, the individual transaction costs and any profit margin for the contracting company are included in the charge made to the customer.

It is not expected that the airline will profit from the sale of offsets. A question will arise then as to whether the airline should absorb the costs involved in setting up and maintaining the offset scheme or whether such administrative costs may reasonably be covered to any degree by monies collected from customers.

Most environmental groups and perhaps most customers would expect the airline to absorb administrative costs. As a minimum, the airline would need to be transparent in this regard. In any event, the administrative costs to the airline are likely to be significant and will include the following:

IT – Setting up the System

If emissions calculations are to be made for customers, this will involve designing and installing a system, integrated with ticket purchasing, that allows easy calculation of the CO₂ emissions associated with a flight the customer wishes to purchase. This is generally done through a calculator, which can provide instant feedback on the CO₂ footprint of all the sectors flown by the airline and allow customers to determine the CO₂ associated with their flight. Coupled to this will be the presentation of the cost of the offset within the ticket purchasing process.

IT – Managing the System

The system can either be managed by the airline or could be contracted to one of the organizations offering offset services. Elements of the system include:

- Monitoring, such as periodic reviews of the system and customer feedback
- Ensuring that the calculator(s) are up to date
- Checking the overall accounts and auditing both internally and, from time to time, by a competent external body

As in all outsourced activities, sufficient internal effort and expertise must be available to ensure effective oversight.



Non-Passenger Elements and Codesharing

Under the system described, not all flights are eligible to be offset. Freight, non-revenue passengers and positioning flights may not be included. Airlines should consider these aspects and determine a policy on such emissions. Codeshare flights operated by a partner airline would also typically be considered beyond the scope of offsetting, as CO₂ emissions can be hard to display given potential unavailability of historical fuel burn data.

Maintenance and Refreshing

Allowance should be made in forward budgets for the costs of maintaining the system including activities such as audits and periodic refreshing of the information presented. As the fleet and served destinations change, adjustments will be necessary to any calculators provided.



4. Offset Proposition

Nature of the Offer

Airlines interface with their customers in three main ways: directly; through travel agents; and, in the case of freight, through freight forwarders. These guidelines are aimed primarily at passenger traffic. If an offset program is to be effective, it is essential that the transaction is simple and transparent, and that transaction costs are kept to a minimum.

Single Transaction

The opportunity to offset can be offered directly at the time of ticket purchase or it can be carried out through a third party. Possibilities include:

- Use of travel agents
- A link referring customers to a site operated by an offset partner
- Included within the price of a ticket

For the sake of simplicity, transparency, and higher acceptance by passengers, it is recommended that ticket purchase and offset purchase be offered to the passenger in a combined, single transaction.

Quantifying Emissions?

One decision is whether to link the amount to the quantified emissions associated with a particular flight, or simply to offer the customer the opportunity to donate to an offset program without making this link. The latter approach could be used to make the same donation for a range of flights or for all bookings made with the airline. It would also be possible to offer both options at the same time.

As an option, it is also possible to link the amount/level to the quantified emissions associated with the flight a customer books and leave the customer the possibility to choose how much he/she wants to invest into the offsetting. That could be done with, e.g., a slide-bar or by letting the customer overwrite the amount in a field.

In the interest of transparency, IATA recommends identifying the emissions associated with a particular flight.

Transparency and General Information

It is critical that customers are provided with sufficient information, allowing them to understand what an offset is, how the quantity of CO₂ associated with a particular flight is estimated, and what project the funds will go to. Such information should appear and be summarized on the receipt sent to the customer. Specifically:

- What emissions are being offset and how they are calculated, including any disclaimers, where appropriate.
- The offset price, the total price for the given journey (one-way or return) and the price per tonne of CO₂.



- Where the money goes. A description of the project, detailing in how far the funds will be benefiting the project.
- Where the project is located and the project development organisation. Alternatively, the quality standard the project has been certified under and the entity that conducted the third-party verification.

Information should also be provided to customers on achievements through the offset program in terms of quantities, offset and projects supported, as well as on key developments with respect to aviation's impact on climate change. This information should not interfere with the ease of access to offsets and simplicity of the offset purchasing system but should be easily accessible and signposted in an appropriate way.



5. Offset Projects and Standards

During the last years, a wide range of CO₂ products have become available. That is also because there is an increased demand for such products. The CORSIA scheme has a clear set of rules and requirements related to offsetting. These rules should also be followed when setting up voluntary offsetting for customers.

Projects

Offsets can be sourced from various types of project activities:

LULUCF (Land Use, Land Use Change and Forestry) and REDD+ (Reducing emissions from deforestation and forest degradation)

- Avoided deforestation
- Reforestation of former forest areas
- Afforestation of new areas
- Other types of land use projects

Methane (CH₄) capture and use in energy generation

- From landfills
- From mines
- From anaerobic digestion of, for example, livestock wastes

Energy efficiency

- More efficient stoves
- More efficient power generation
- Use of "waste" energy in co-generation

Renewable energy

- Wind turbines
- Hydroelectricity
- Solar, thermal, and photovoltaic systems

The success of a carbon offset program depends amongst other things on the choice of projects offered to the customer. Points to consider when selecting a project include:

- Standard – what verification and auditing procedures are in place for the project
- Price – the price per ton of CO₂ that is applied for a specific project
- Relevance to your business and existing CSR activities
- Geographical location
- Resonance with customers – projects with social and economic benefits to local communities may have stronger appeal



Standards

It is important to examine project offers with care, not just the way in which the product is being sold and the reputation and reliability of the organization offering the offsets, but also the quality standard applicable to the project and offsets. The recommended standards are those eligible for CORSIA, and as of the 6th Edition of the "[CORSIA Eligible Emissions Units](#)" document of 03 November 2021, they are as follows:

- Clean Development Mechanism (CDM)⁵
- The Gold Standard (GS)⁶
- Verra / Verified Carbon Standard (VCS)⁷
- American Carbon Registry (ACR)⁸
- Climate Action Reserve (CAR)⁹
- Architecture for REDD+ Transactions (ART)¹⁰
- China GHG Voluntary Emission Reduction Program¹¹
- Global Carbon Council (GCC)¹²

⁵ <https://cdm.unfccc.int/>

⁶ <https://www.goldstandard.org/>

⁷ <https://verra.org/>

⁸ <https://americancarbonregistry.org/>

⁹ <https://www.climateactionreserve.org/>

¹⁰ <https://www.artredd.org/>

¹¹ <http://registry.ccersc.org.cn/login.do>

¹² <https://www.globalcarboncouncil.com/>



6. Program Management

Setting up an offset program will necessitate involvement from a wide range of internal and external stakeholders, including environment and sustainability, IT, audit, communications, and fuel. In the lead up to launch, it is recommended that a team be established including those with the appropriate expertise.

Some additional activities may be necessary on a case-by-case basis, such as government relations, in order to avoid conflict with government priorities and policy. A senior manager should lead the team with access to the top management of the airline.

Audit and Verification

Offset programs should be subject to at least the same standards of financial audit as other parts of the business. This also applies if the programs are outsourced, and it is recommended that annual accounts be published in appropriate ways. Audits should also include a thorough check on the achievement of offsets, offset volumes, and overall transparency to passengers.

There are a growing number of verification authorities, including those with broader certification and verification expertise, who have competence in this area.

7. Setting up the System

Customer Interface

If the offset offer is not conspicuous and easy for the consumer to understand and implement, the take-up will be low, and the credibility of the airline's offset program will be at risk. Initially, the offer should be in a prominent place on the booking system, and the quantity of CO₂ and the price should be clearly visible.

The booking system should be linked to the system of the offset provider to allow the latter to automatically issue a receipt for the amount offset, including details of the project that is being supported and confirmation that the relevant amount will be removed from the registry of the project. This receipt can be branded in an appropriate way.

Carbon Calculator

Calculating the CO₂ emissions of flights can be done in many different ways. Airlines may use their own calculation method, although IATA recommends the use of the [RP1726 document](#). RP1726 defines the best practices for CO₂ emission calculations; it was developed by the industry for the industry, with involvement from major airlines, aircraft manufacturers and standard-setting bodies.

The following data is used for the calculation:

- **User Input** – based on user input, the airline's booking system defines the itinerary, and it specifies origin, destination, and any stopover/connecting airports. This will normally include codeshare and other sectors paid for through that airline.



- **Trip Distance** – the Great Circle Distance (GCD) between two airports is calculated using longitude and latitude coordinates. A correction factor can be used to take account of delays, wind, and weather conditions en-route.
- **Aircraft Type** – for calculation of the carbon footprint, it is necessary to define the type(s) of aircraft used to fly the specified itinerary. Here, the distinction should also be made between narrow-body and wide-body aircraft.
- **Total Fuel Burn** – to determine the total fuel burn for the flight(s), the use of actual trip fuel data over a whole year would give the most reliable results.
- **Passenger-to-Freight Ratio** – to establish the passenger-related fuel use for the flight, the total fuel burn is divided between the number of passengers and the tonnage of mail and freight using load factor data. Unless actual flight data is used, average passenger and freight load factors can be used to establish the ratio to make this division.
- **Seat Capacity & Passenger Load Factor** – the passenger-related fuel use for the flight is divided by the actual number of passengers on the flight. If actual numbers are not used, some assumptions will need to be made for the seat capacity and passenger load factor on the flight, using either airline or industry averages.
- **CO₂/Passenger** – using the above factors, the CO₂ associated with each passenger is calculated. Details on how the calculation works can be found in the [IATA RP1726](#).

The Airline Interface

Staff, in particular those dealing directly with the public, media and decision-makers, should be well informed about the offset program. They should be included in the preparations for launch of the program and be briefed on:

- Motivations behind introducing the program
- General aspects of aviation and climate impact and mitigation measures being (See Section 00)
- Information on the CO₂ emissions from the airline such as the total relative to national transport emissions or some other simple comparisons.

In addition, information on the program itself should be disseminated among staff, including:

- Where the projects are located and how they work
- Where the money goes
- Scope of offsets, in particular whether they cover passenger and/or freight operations
- How receipts are provided, and accurate records maintained
- How aspects such as crew and non-revenue passengers are covered



8. Launch and Operations

The following checks can be considered for launching and subsequently running the program.

Preparations	Monitoring & Auditing	Feedback & Improvement
Setting a date for the program launch.	Establishing a system for internal reporting of progress so that records are available from the start.	Periodic customer surveys should be carried out to assess ways to improve the system.
Steps 1-7 in this document should be referenced and the management be confident that they can be completed on time.	Establish regular reporting to top management, e.g., on key metrics such as uptake in CO ₂ and number of transactions.	The program should be reviewed and modified in the light of feedback and any changes in regulations.
Systems should be adequately tested. This could involve the use of focus group(s) to test user friendliness as well as general user acceptance testing from IT and similar.	An internal audit to be carried out shortly after the launch and an annual internal audit, thereafter.	Regular updates on the program, its achievements, and related matters such as understanding of aviation's climate change impact should be communicated.
A communications plan should be prepared including information for staff, customers and to external audiences including the media.	An external audit to be carried out and the findings published at about 18 months to two years after launch.	The offset program should become an integral part of the airline's approach to corporate responsibility.
Special advance notice may be relevant for corporate customers.	Monitoring and audits should cover the complete system, including relevant partners.	
An FAQ document or similar should be circulated to senior management and to staff directly involved.		