Fall 12-14-2018

# Catalog of Voluntary Carbon Offsets in Commercial Aviation: Understanding Roles of Corporations and States

Shannon Hahn
smhahn2@usfca.edu

# CATALOG OF VOLUNTARY CARBON OFFSETS IN COMMERCIAL AVIATION: UNDERSTANDING ROLES OF CORPORATIONS AND STATES

In Partial Fulfillment of the Requirements for the Degree

MASTER OF ARTS
in
INTERNATIONAL STUDIES

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November 20, 2018

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Thesis Advisor: Dr. Stephen Zavestoski

UNIVERSITY OF SAN FRANCISCO

Under the guidance and approval of the committee, and approval by all the members, this thesis project has been accepted in partial fulfillment of the requirements for the degree.

APPROVED:

_____ _____
Capstone Adviser Date

_____ _____
MAIS Director Date

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*"No one accomplishes anything in this life on his or her own. Even when we stare in awe at what might appear to be a solitary feat - like climbing to the top of a mountain alone - there is invisible support. There are loved ones at home who cherish the adventure. A mentor to teach. A colleague with whom the experience can be shared. And unseen magic too."*

-Allan Hamilton

I would like to first acknowledge and thank my advisor and the University of San Francisco, because of which all of this was made possible: Dr. Stephen Zavestoski is an incredibly helpful, enthusiastic and inspirational person and professor. Because of his expertise in the field of Environmental Studies, I was able to push boundaries in my interdisciplinary degree in the field of International Studies, which proved tremendously fulfilling for my intellectual development. Secondly, thank you to my employer throughout this program and process, the California Academy of Sciences, for fostering my desire to "explore, explain and sustain life" (https://www.calacademy.org/about-us). And to my mentors there and the supplementary opportunity to complete the internship requirement for this degree at that fantastic institution. Finally, a huge thank you to my family and friends for your constant support, encouragement and curiosity of my studies especially in this challenging project, but also beyond.

ABSTRACT:

While the need for travel exists in the field of International Studies and in light of the very complex global climate crisis and increased international commercial air travel this paper catalogs and analyzes the trailblazing voluntary carbon offset programs of 1) Air New Zealand, 2) British Airways (IAG), 3) Cathay Pacific, 4) Emirates, 5) Lufthansa, 6) Qantas, 7) Scandinavian Airlines (SAS) and 8) United Airlines, arguing that voluntary carbon offsets as a response to the global climate crisis are ineffective and an echo to international agreements being unenforceable. The paper is hopeful for corporate focus on technology and innovation in addition to offsets in the aviation industry as well as in other industries, and contains a notable example in the case of SAS airlines. The airline data, in the Airline Data Table and Airline Data Details sections, serve as evidence that the state indeed has a role in environmental solutions. The conclusions draw categorical comparisons, some very objective such as the existence of a carbon calculator, the origin of the airline, the carbon offset partner referenced and the more subjective and the crux of my findings: the local/global situation of voluntary carbon offset programs and the individual/corporate responsibility for each of the eight airlines detailed. Finally, this thesis contributes a framework for similar studies in other sectors and details further applied research.

INTRODUCTION:

The climate crisis is worsening and the problem could not be more global. “These phenomena include the increased temperature trends described by global warming, but also

encompass changes such as sea level rise; ice mass loss in Greenland, Antarctica, the Arctic and mountain glaciers worldwide; shifts in flower/plant blooming; and extreme weather events" ("What's in a name? Weather, global warming and climate change", 2016). The climate crisis is extremely complex and knows no borders, there are many actors involved in finding and implementing plans and solutions for the issue. This paper will explore state's and corporation's roles through the lense of the international commercial aviation industry. It is necessary to set the stage to understand why climate change and greenhouse gasses are relevant to my project: exploring one current solution, the voluntary carbon offset (VCO) as offered as a form of corporate social responsibility (CSR), from the following eight international airlines: 1) Air New Zealand, 2) British Airways (IAG), 3) Cathay Pacific, 4) Emirates, 5) Lufthansa, 6) Qantas, 7) Scandinavian Airlines (SAS) and 8) United Airlines.

Situated in the debate of climate change, the most seminal and supporting text is Thermal Equilibrium of the Atmosphere with a Given Distribution of Relative Humidity, written by Syukuro Manabe and Richard. T. Wetherald and published in 1967. Manabe and Wetherald (1967) were the first to use computer modeling to make what are still considered today as sound predictions regarding climate change. Their paper estimated that doubling the CO2 content in the atmosphere causes the temperature of the atmosphere, which is normally fixed humidity, to rise between 1.3C and 2.4C (Manabe, and Wetherald, 1967, p. 241–259).

Research on the topic dates back further to the 1800s. In 1824, Joseph Fourier established the science behind the 'greenhouse effect' finding that the Earth's surface temperature increased beyond what was expected from just the Sun's heat alone due to thermal radiation that was emitted down from the atmosphere. In the 1860s, John Tyndall wrote essentially that nitrogen

and oxygen, although making up most of our atmosphere, were not greenhouse gases nor a part of the greenhouse effect, but carbon dioxide, which made up a minute portion of the atmosphere, was a massive player in the greenhouse effect. In 1896, Svante Arrhenius added the concept and science behind what we now call 'positive feedback' to the global warming and broader climate change conversation, "He allowed for the fact that increasing carbon dioxide would warm the atmosphere and probably increase its water vapour content, enhancing the warming due to the original increase in carbon dioxide" (Mitchell, 2015). Manabe, Wetherald, Fourier, Tyndall and Arrhenius offer support in identifying carbon emissions as a main cause of climate change and in conjunction with Charles Keeling (1976) and colleagues and Guy Callendar (1938) then link to fuel combustion by humans and carbon emissions is made (Fleming, 2007).

The United States Environmental Protection Agency (EPA) states that carbon emissions from fossil fuels have increased exponentially, "Since 1970, CO2 emissions have increased by about 90%, with emissions from fossil fuel combustion and industrial processes contributing about 78% of the total greenhouse gas emissions increase from 1970 to 2011. Agriculture, deforestation, and other land-use changes have been the second-largest contributors" (Global Greenhouse Gas Emissions Data, 2017).

Climate change encompasses the term global warming and goes beyond simply rising temperatures, climate change includes all known changes to the climate due to mainly carbon emissions caused by the burning of fossil fuels ("What's in a name? Weather, global warming and climate change", 2016). By no means are anthropogenic greenhouse gas emissions the only cause, the issue is extremely complex, but anthropogenic carbon emissions are primary.

Because governments can not simply regulate and phase out carbon, as with ozone-depleting substances (ODS) in the Montreal Protocol, due to the fact that carbon is involved in almost all global economic activity, there has been a multitude of proposed government and private solutions ("The Montreal Protocol on Substances That Deplete the Ozone Layer," n.d.). Among them: carbon markets, cap-and-trade schemes, carbon funds, carbon taxes and carbon credits. My focus is on the trending solution of international airlines: voluntary carbon offsets.

## DEFINITION

The term carbon offset refers to a variety of project-based emission reduction plans, both mandatory or voluntary, that an individual, company, country or any entity can purchase to pay for the reduction of carbon from one place to another. Commonly a project is carried out by a non-profit or organization in a location where it is easier, cheaper and faster to reduce emissions than however the carbon was originally emitted (Kollmuss, Lazarus, Lee, LeFranc, & Polycarp, (2016). It is imperative that this abides by the concept of additionality, reducing emissions that would not have been reduced otherwise. ("Additionality", n.d.). Nonetheless, offsets can be seen as an exploitative international dynamic, but also a means to fund climate positive projects domestically and internationally, although credibility and the positive impact of projects is debatable (Miller, 2012).

For the purposes of my research I will be exploring the *voluntary* carbon offset, my definition is as follows:

Voluntary Carbon Offsets (VCO) voluntary purchases by an individual or group by way of a corporation or entity, that are not regulated by the government. In this industry of study, airlines, often work with a non-profit or organization to fund carbon-reducing projects locally and/or globally. An example of which would be an individual purchasing a $38 offset for a round-trip flight from San Francisco to Frankfurt via Lufthansa, a German company, which works with mylcimate.org a Swiss non-profit, using all or most of the $38 to install solar lights in place of kerosene lamps, promote solar technician education, and education in Ethiopia and Kenya.

Although not unique to the complex issue of climate change, attempts of binding international programs are symbolic but not easily enforced. For example the group International Civil Aviation Organization (ICAO) exists but is primarily focused on safety,

> ICAO works with the Convention's 192 Member States and industry groups to reach consensus on international civil aviation Standards and Recommended Practices (SARPs) and policies in support of a safe, efficient, secure, economically sustainable and environmentally responsible civil aviation sector. These SARPs and policies are used by ICAO Member States to ensure that their local civil aviation operations and regulations conform to global norms, which in turn permits more than 100,000 daily flights in aviation's global network to operate safely and reliably in every region of the world. ("About ICAO," n.d.)

The ICAO touches on addressing emissions with Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) but much of the implementation starts in January of 2019 and I question its ability to be enforceable. Nonetheless the symbolic influence of supranational powers is seen with the global norm to be more sustainable, which is likely a motive behind the corporate voluntary response that I am examining. A need for differentiated regulatory responsibilities by states themselves and fostering innovation is where I stand regarding necessary next steps. My thesis intends to inventory and analyze a specific solution,VCOs as international airline CSR. Therefore I urge continued applied research on the topic. Which would include any exact stipulations of state solutions and easy globally adaptable innovations, both of which are outside the scope of this project. The issue(s) as well as the solution(s) are complex. For example, contrails, the white line-like narrow clouds that form behind an airplane and other cloudiness effects are an aviation specific phenomenon, which have been recently estimated to have the same degree of negative environmental impact as CO2 aviation emissions ("The climate group at LAE seeks to quantify current and future climate impacts of aviation, including CO2 and non-CO2 impacts such as contrails," n.d.).

My hope, my contribution, is that the information I have gathered and the method I have used can serve as background research, proof and framework for similar studies in other sectors working towards the ultimate goal of moving forward in finding effective solutions. Carbon offsets may be better-than-nothing steps in the right direction, but the need for solutions now and over the next decade could not be more urgent. What I have concluded from my research is that VCOs are an ineffective solution, and actors of influences such as states will likely have to play a

very important role in developing and enforcing effective solutions. I was able to come to these conclusions by aggregating data in a few very important objective and subjective categories, which can be seen in Table 2: Airline, Airline Country of Origin (HQ), Alliance, Offset Partner Referenced, Location of Offset Program(s), Carbon Calculator, Airline Emphasis on Individual, Claim Pioneer in Environment/Offset Program, other Environmental Initiatives. These categories support my claims, namely the local/global situation of voluntary carbon offset programs and the individual/corporate responsibility all while claiming to be pioneers as well as the need for other environmental initiatives. Additionally and more nuanced airlines and corporations in other industries are already preparing for state regulations to be imposed upon them in the carbon emissions realm, all the while marketing themselves as environmentally responsible and sustainable. Although there are good examples of environmental initiatives that corporations have defined for themselves, I hope states are diligent in drafting regulations. Lastly, I believe and hope corporations will be critical actors in channeling CSR bandwidth on technologies that will facilitate a move away from fossil fuel.

# CHAPTER ONE: LITERATURE REVIEW

## Climate Change

Aviation emissions are relatively small when compared to dietary choices, such as cutting out meat and dairy, which has been deemed the ‘single biggest way’ to reduce your impact on earth (Carrington, 2018). While I focus on the category of air travel my hope is that my research and method of research can be transferable to other spheres. Figure 1. demonstrates the

breakdown of greenhouse gas emissions by sector. Air travel falls under the transportation sector, which accounts for 14 percent of the issue globally. Carbon Dioxide accounts for 77 percent of global greenhouse gas emissions.

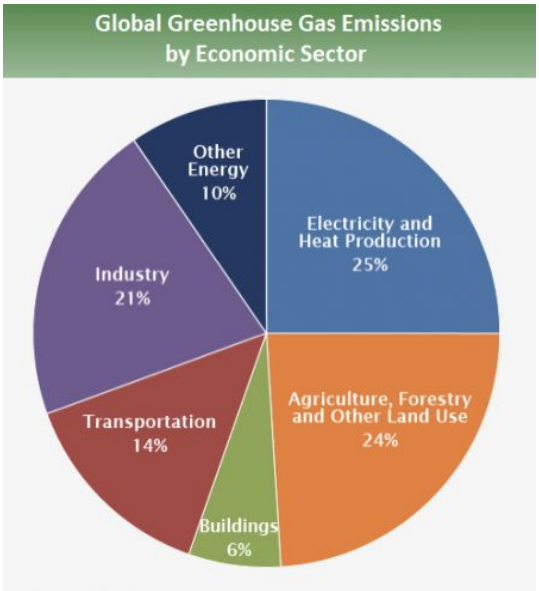


Figure 1. Global GHG Emissions by Economic Sector reprinted from Global Greenhouse Gas Emissions Data, 2017, from https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data.

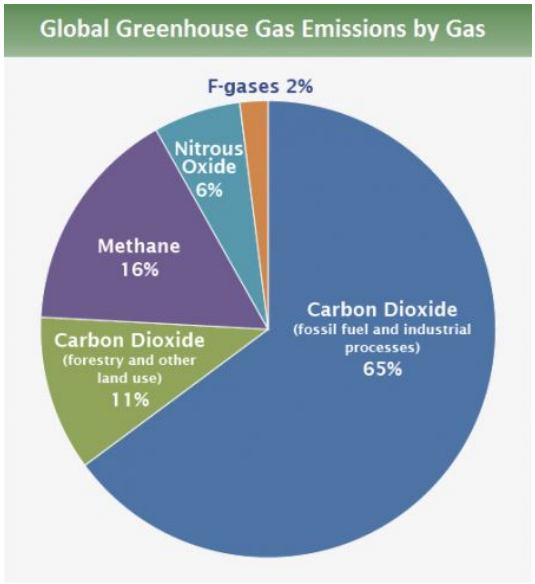

Figure 2. Global GHG Emissions by Gas reprinted from Global Greenhouse Gas Emissions Data, 2017, from https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data.

It is clear that carbon emissions account for the largest portion of greenhouse gas emissions, which is why I have, and many others chose to, focus on this gas, but it is important to note that it is not the only culprit. I do not neglect the fact that although carbon represents a majority of greenhouse gas emissions, the issue is much more vast and varied among greenhouse gases and beyond. Carbon fundamentalism is not my intention, rather I have taken on the industry of air travel given its relevance to my discipline of international studies, the fact that it is growing exponentially as seen in Table 1, and because of the simultaneous increase of the global climate crisis, international travel, and VCO schemes as a form of CSR.

Presentation of 2016 Air Transport Statistical Results

**Table 1. World total revenue traffic — international and domestic**
(scheduled services, 2007–2016)

| | Passengers | | Passenger-km | | Freight tonnes | | Freight tonne-km | | Mail tonne-km | | Revenue tonne-km | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | (millions) | Annual increase % | (millions) | Annual increase % | (millions) | Annual increase % | (millions) | Annual increase % | (millions) | Annual increase % | (millions) | Annual increase % |
| 2007 | 2 462 | 8.8 | 4 513 096 | 8.2 | 41.4 | 6.2 | 172 844 | 4.8 | 4 418 | -0.6 | 593 269 | 6.6 |
| 2008 | 2 498 | 1.5 | 4 603 257 | 2.0 | 40.0 | -3.2 | 171 183 | -1.0 | 4 916 | 11.3 | 603 062 | 1.7 |
| 2009 | 2 488 | -0.4 | 4 554 781 | -1.1 | 39.7 | -0.8 | 155 988 | -8.9 | 4 647 | -5.5 | 577 180 | -4.3 |
| 2010 | 2 705 | 8.7 | 4 917 070 | 8.0 | 47.3 | 19.2 | 186 833 | 19.8 | 4 884 | 5.1 | 644 962 | 11.7 |
| 2011 | 2 870 | 6.1 | 5 240 510 | 6.6 | 48.3 | 2.2 | 187 393 | 0.3 | 5 035 | 3.1 | 676 965 | 5.0 |
| 2012 | 3 004 | 4.6 | 5 520 842 | 5.3 | 47.7 | -1.4 | 185 439 | -1.0 | 5 225 | 3.8 | 700 580 | 3.5 |
| 2013 | 3 138 | 4.5 | 5 824 084 | 5.5 | 48.7 | 2.3 | 186 176 | 0.4 | 5 619 | 7.5 | 730 315 | 4.2 |
| 2014 | 3 316 | 5.7 | 6 172 191 | 6.0 | 50.3 | 3.3 | 194 844 | 4.7 | 6 111 | 8.8 | 773 135 | 5.9 |
| 2015 | 3 556 | 7.2 | 6 635 006 | 7.5 | 50.6 | 0.5 | 197 344 | 1.3 | 6 587 | 7.8 | 820 368 | 6.1 |
| 2016 | 3 796 | 6.8 | 7 124 350 | 7.4 | 52.6 | 4.0 | 204 895 | 3.8 | 6 764 | 2.7 | 872 361 | 6.3 |

Source.— ICAO Air Transport Reporting Form A and A-S plus ICAO estimates.

Table 1. World total revenue traffic – international and domestic reprinted from Presentation of 2016 Air Transport Statistical Results Annual, 2016, from

https://www.icao.int/annual-report-2016/documents/arc_2016_air%20transport%20statistics.pdf

As a proposed solution to address human industrial contribution, the concept of the Carbon Market emerged out of the Kyoto Protocol (UN Framework Convention on Climate Change, UNFCCC 1997). The Kyoto Protocol's intention of the offset was to find a way for industrialized countries to meet their carbon emission reduction targets (carbon neutrality) by purchasing/funding carbon emission reduction projects in the developing world, more specifically with the Clean Development Mechanism (CDM), and in the eastern European economies in transition (Joint Implementation) (Bumpus, & Liverman, 2008, p. 127-155). Transactions from the CDM being carried out in developing countries account for the majority of carbon offsets to date, and represent a growing market in their own right. CDM and VCOs are paralleling concepts and markets operating under distinct governance frameworks (Bumpus, & Liverman, 2008, p. 127-155). CDM as the formal yet symbolic, and VCOs as the unregulated and voluntary. VCOs are nonuniform and private. Since the neo-liberal VCO takes on different and elusive forms, yet is becoming more relevant, I have chosen to inventory examples of VCO programs in the airline industry. This ia a timely topic that has not been explored at an academic level, but is being debated on blogs and online bulletins such as thepointsguy.com and redditt.com. The Points Guy, for example, supports carbon offsets while on Redditt and the blogosphere they are being questioned. (Genter, 2018). Carbon markets have become a complex and at times a blurred, abstract commodity spanning borders, similar to citizenship, cryptocurrencies or multinational corporations in the ever-globalizing universe.

In Michael Wara's article "Is the global carbon market working?" (2007) I align with his argument that the Clean Development Mechanism can be viewed not only as a market but also as a subsidy and a political mechanism which has been effective in achieving its political goals, but I do not believe that over the last ten years that the carbon market has withstood the test of time environmentally. Carbon markets isolate carbon, which is a narrow and flawed measure of negative impact. The same criticism can be applied to the VCO, one of the carbon market's subsets. Ellerman, Marcantonini and Zaklan's article "The European Union Emissions Trading System: Ten Years and Counting. Review of Environmental Economics and Policy" evaluates the European Union (EU) Emissions Trading System (ETS) over the last ten years. EU ETS is the world's largest cap-and-trade program and arguably the most relevant market-based application of economic principles to the climate problem and its performance is not promising.

> This debate can be summarized as being between those who view the current, much-lower-than-expected price as indicating serious flaws in the EU ETS and those who argue that the low price shows that the system is working exactly as it should given all that has happened since 2008 (i.e., reduced expectations for economic growth in the Eurozone, increased electricity generation from renewable sources, the significant use of offsets), including the possibility that abatement may be cheaper than initially expected. (Ellerman, A. D., Marcantonini, C., & Zaklan, A. (2015), p. 89-107)

The key argument Ellerman, Marcantonini and Zaklan make is questioning the exact objective of the carbon market by asking,

> whether the objective is solely to reduce GHG emissions or also (and perhaps principally) to transform the European energy system. Although no one is suggesting that emissions have exceeded the cap, or that they will do so, current prices do not seem likely to lead to the kind of technological transformation that would greatly reduce Europe's reliance on fossil fuels." (Ellerman, A. D., Marcantonini, C., & Zaklan, A. (2015), p. 89-107)

To me the ultimate goal is to transform the energy system, the carbon market is merely a step in that direction but does not directly allow for true transformation.

In addition to the background information on the carbon market and connecting climate change and my aviation-focused project, it is incredibly relevant and important to highlight that the urgency of the climate issue. Evidently, in the midst of writing this paper the U.N. stressed extreme urgency on addressing climate change, with An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, which details strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Recently big headlines such as, "The world has just over a decade to get climate change under control" (Mooney & Dennis, 2018) and "Final call to save the world from 'climate catastrophe'" (McGrath, 2018) are abound. And close to home in the US state of California, many fires are burning and spreading. Among them, the Camp Fire in Butte County is now the most destructive fire in California state history, surpassing last year's, 2017 Tubbs Fire in Santa Rosa, which was previously the most destructive in California state history (Irfan, 2018).

## Aviation

Extreme weather events directly and negatively impact air travel, causing increased turbulence and take-off weight challenges due to higher temperatures and floods disrupting landing and accessibility to certain airports ("Piloting aviation industry through a changing climate," 2018). Travel accounts for roughly 1.5% of global anthropogenic greenhouse gas emissions, but "aviation is the fastest growing mode of transportation with passenger demand projected to rise by a factor of three by 2050. While an average fuel burn reduction of 1-2% per year has been achieved in the past, this has been and will most likely be far outpaced by growth" ("The climate group at LAE seeks to quantify current and future climate impacts of aviation, including CO2 and non-CO2 impacts such as contrails," n.d.). Now the IPCC, Intergovernmental Panel on Climate Change, estimates that aviation contributes around 3% of the world's total carbon dioxide (CO2) emissions, that is a huge leap already from the 1.5% estimated less than 10 years ago ("FlyNeutral FAQs," n.d.). Although the IPCC presents one of the more generous figures I have found it still does not account for other greenhouse gases and other less understood factors such as contrails. International Air Transport Association (IATA) quotes that, the aviation industry is responsible for less than 2% of global carbon dioxide emissions from human activity (IATA, n.d.). IATA is the largest of international airline trade associations "representing some 290 airlines or 82% of total air traffic" (IATA, n.d.). The association supports many areas of aviation activity and helps formulate industry policy around aviation relevant issues. Other similar associations exist such as the not-for-profit Air Transport Action Group (ATAG)

Finally, the International Civil Aviation Organization (ICAO) is a UN specialized agency, established by states in 1944 to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention). ICAO Council's Committee on Aviation Environmental Protection (CAEP), which consists of members and observers from states, intergovernmental and non-governmental organizations represents the aviation industry on environmental affairs (About ICAO, n.d.).

## Carbon Footprint

The carbon footprint, does not have a commonly agreed upon definition, sometimes the term is synonymous with the ecological footprint,

> The carbon footprint originates from the concept of ecological footprint, which is a measure of human demand on the Earth's ecosystems. It is a standardized measure of demand for natural capital that may be contrasted with the planet's ecological capacity to regenerate. It represents the amount of biologically productive land and sea area necessary to supply the resources a human population consumes, and to assimilate the associated waste. (Gao, Wang & Liu, 2013)

More often carbon footprint specifically refers to a measure of carbon emissions. “A carbon footprint can be analysed for various different functional units at different scales and using different methods” (Gao, Wang & Liu, 2013). In works I read for this research the carbon

footprint has been consistently measured in tons. Although this concept can be very loose, companies and individuals are increasingly interested in calculating, measuring and minimizing carbon footprints.

What we have control over in our carbon offset is actually very small (What is a carbon footprint - definition, n.d.). It is not possible for the individual to make much of a dent in their carbon footprint, but for Americans and Europeans individual air travel is the one of the largest controllable factors. For frame of reference: "One round-trip flight from New York to Europe or to San Francisco creates a warming effect equivalent to 2 or 3 tons of carbon dioxide per person. The average American generates about 19 tons of carbon dioxide a year; the average European, 10" (Rosenthal, 2018). For those that have the means I am not entirely arguing to not fly, but what I propose is to be intentional about travel – less frequent trips, shorter distance trips, driving instead of flying depending on distance, longer stays, direct flights, and to examine your stance on the concept of the carbon footprint – what can you control and what you cannot control, because it is outside of your ability or because you do not want to? And to use that type of inquiry-based critical thinking regarding other top culprits. The carbon footprint is a very individualistic idea that is often used as a means to place responsibility on the individual rather than industry. Top down change is the means to the next logical step with the ultimate goal of industry innovation.

States, Corporations and Corporate Social Responsibility

Sassen's "the State and the Global City: Notes Toward a Conception of Place Centered Governance in Globalization and Its Discontents" (1999) and Ohmae's, "the End of the

Nation-State: The Rise of Regional Economies (Selections)" (2010) detail concepts of the role of states, which is relevant to understanding my interest in corporations and CSR as a form of influence and power. Governance in a global sense arguably has become less and less nationalized and more regionalized and even privatized. My project provides evidence that this is true but also that states are and could be meaningful actors in environmental affairs, specifically in carbon regulation in the airlines industry. This thesis highlights the ineffective response of VCOs, a "good will" effort by airlines, in the absence of regulation. Further my project taps into the aviation industry's other adaptation and mitigation initiatives as well as discovers new questions for future research to promote solutions. As expected the private aviation sector can be muddled, subsidized or even run by government stakeholders. In regards to Ohmae, developed or developing nation aside, I cannot imagine a day that states are obsolete and completely cut out by "region states" or corporations for that matter. There is an increasing role for regional and private action but the role of the state continues to be important.

Corporate social responsibility, or CSR, is defined as "self-regulating business model that helps a company be socially accountable — to itself, its stakeholders, and the public" (Investopedia, 2018). CSR is often described as any corporate activity intended to further social welfare not required by law (Barnett, 2007). Examples would be aiding and supporting in matters such as, education, health, human rights and the environment. The human rights specific type of CSR, the UN's "Guiding Principles" by John Ruggie / UN Human Rights Council in 2011, was groundbreaking. CSR is a model and strategy and can be seen as a way to maximize doing well in the eyes of stakeholders, clients and the public, but not necessarily for the sake of doing good. CSR is the term often used to describe the private sector's response to a crisis or issue. In the

current landscape, aviation and environmentalism seem to contradict each other, but CSR attempts to alleviate the contradiction.

# CHAPTER TWO: METHODS

## Inspiration Meets International Studies

The main inspiration behind this project came from an internal debate around travel and the environment. I believe in the power of travel as a form of education and personal growth but there is a paradox in my sentiment, travel contributes to climate change. This extends also to subscribing to valuing space exploration for the potential to innovate but also to humble our species. Being curious about the world and understanding it at a global scale likely involves movement across the planet which in many cases means via air travel. In the field of International Studies this conundrum is very apparent because the work-related air travel of students, scholars and practitioners contributes to climate change, exacerbating man of the problems that we are hoping to alleviate. I am on the side of the debate that it is ideal as possible and almost necessary to be or physically have been in the place, culture, state you are producing knowledge about. This can not go without recognizing travel is often costly and a privilege, as is academia. I invite others with these allowances, especially many of my colleagues and peers, to not only travel intentionally and take the time to make informed decisions on environmental and social responsibility but to also apply this philosophy at large.

## Airline Selection Criteria

The criteria and process for the selection of the eight airlines 1) Air New Zealand, 2) British Airways (IAG), 3) Cathay Pacific, 4) Emirates, 5) Lufthansa, 6) Qantas, 7) Scandinavian Airlines (SAS) and 8) United Airlines was the following. I first familiarized myself with airlines operating internationally today, as well as taking into account international recognition. I then researched within this extensive list of airlines to identify which have an online presence and online booking processes as well as which among them had CSR related to the environment and more specifically carbon offsets. Among this list are airlines that explain what a carbon offset is, list corporate affiliations, offer VCOs to customers, and some combinations of all of the above. Some airlines who qualified for the parameters I set in my search were left out of my analysis due to my efforts to have a variety of nations represented and keep the number manageable and appropriate for the scope and timeframe of my work. Initially I had over eighteen airlines in my database among the removed were duplicates from the US and Australia: Delta and Virgin Australia. As I did not want the list to be weighted towards any country, although the list is heavily Western.

## Grounded Theory

In inventorying each of the eight airlines I have selected in my study I used aspects of the grounded theory approach and text analysis.

> Grounded theory is a qualitative research method that identifies a range of essential elements that, when combined, offer a consolidated framework within which wide-ranging data are gathered, assessed, and subsequently used in developing theory, based on what has been observed. These essential elements include the coding and

> categorization of data, concurrent data collection and analysis, the writing of memos, theoretical sampling, constant comparative analysis using inductive and abductive logic, the application of theoretical sensitivity, the development of intermediate coding practices and routines, the selection of core categories from the data, and the application of theoretical saturation. (Rosenbaum, More & Steane, 2016)

I used this approach because the interpretation of airline websites is very nuanced but the purpose was to generate and categorically understand the data. Although I did not end up using systematic coding, my starting point was broad, allowing for themes to emerge. Given my small sample size I am not able to generalize about airlines, but I am able to identify categories and trends, draw conclusions about VCOs and develop new questions and a clearer direction for further research.

## Airline Database Method

My method involved creating an airline database. I copy-pasted text from the eight airlines websites between the months of August and November of 2018 and the categories in the database took shape as I was forming it. This dictated the categories and main points points I've covered for each airline: The Basics (Name,Country of Origin, Alliance);Offset Partner Referenced; Location of Offset Program(s); Airline Definition of Carbon Offset; Carbon Calculator; Airline Emphasis on Individual; Claim Pioneer in Environment/Offset Program and Other Environmental Initiatives. In order to organize these comparisons I created a digestible table that houses all of the information as well as serves as a quick reference to the specifics of each airline's detailed section. Many of the airlines have their own definition of carbon offset,

which I inventoried in the details of each airline, not in the table. When relevant I added sections about Government/Policies and Ownership/Stakeholders in the airline data details portion. I decided to utilize each airline section as a place to not only detail but to also analyze to keep my more specific findings in context.

Having a carbon calculator, working with a nonprofit to carry out the offset, offering offsets in local and international contexts, nationalism, emphasizing the carbon footprint and the responsibility of the individual not the corporation, policy and being on the cutting edge are themes and what I consider the most important to glean insights from, as well as other information on what airlines are or are not doing to mitigate climate change. How each of these markers correlate with one and other are simplified in the table and expanded upon in the corresponding sections referenced. I considered these variables most important as they demonstrate the formation of the individualistic and corporate driven culture at the brink of the future of addressing climate change. The airline industry is extremely competitive but also tight knit as I referenced in my literature citing many international organizations and affiliations within the community, thus it is no surprise that each airline wants to be on the cutting edge and represent their brand as the most appealing and cater to the shift of importance of ethics to the modern consumer (Ong, 2017).

## Challenges

I did not begin this research with a strong stance on whether carbon offsets are sufficient or insufficient, I was hopeful I would find them to be effective, but I did quickly become

skeptical. My starting point also included my interest in environmental awareness and advocacy and that we are living in a pivotal moment of addressing the climate catastrophe. I do not intend for this document to be printed, hence the digital integrations and hyperlinking. Also in the spirit of the issue that inspired this thesis, I conducted a study, on a topic that was ethical and global yet required no air travel. This proved challenging and I received pushback from peers in my field for this decision.

Another challenge I encountered was the the changes to the sites that occured in my research time frame. In addition to adding text to my database I secondarily collected screenshots in a separate file. The screenshots were intended to capture aesthetic and visuals and not as a way to inventory information, I intentionally chose to include images, many of calculators, to have exact figures available to the reader, and appendices in this paper as I believe they serve as supporting information for the readers' benefit and interpretation. In hindsight I would have relied more on screenshotting for inventorying of text, which would have allowed me to better track change over the four months. Although I was still able to track some change using my copy-paste method as seen in the Air New Zealand and Qantas sections. On the other hand it was useful to have information from the airline websites in plain text because in addition to my own words and analysis I found it necessary to include many quotes in the airline data detail section for the most accurate display of data for my reader.

Lastly, it would be beneficial to conduct this research in many languages, and with different world perspectives. Continued research on the topic from colleagues of different backgrounds than my own that could tap into other corners of the internet, other airlines that could be very well known to some but not on my radar. I would like to note that although my

research was primarily in English, there is very little restriction around content available to me on the internet in the United States and much of the information I was hoping to use was [also] made available in English by the content creators, nonetheless I did use a small portion of content in German and Spanish. I have done much research to balance out the fact that my primary source of information is from the airlines websites themselves, which would appear to be a bias in my source, but I feel that it is the contrary as I am not arguing on behalf of their bias, in fact I am arguing against it and that I am giving them the best benefit of the doubt using their most polished public pages. In two instances of lack of information on specific and necessary points regarding British Airways and SAS, I did reach out directly via email. I have yet to hear from SAS but did receive a helpful response from British Airways, but the email has a confidentiality disclaimer and I am unable to append the content, although I would have liked to.

## CHAPTER THREE: AIRLINE DATABASE AND ANALYSIS

# Airline Data Table

| Airline | Airline Country of Origin (HQ) | Alliance | Offset Partner Referenced | Location of Offset Program(s) | Carbon Calculator | Airline Emphasis on Individual | Claim Pioneer in Environment/Offset Program | Other Environmental Initiatives |
|---|---|---|---|---|---|---|---|---|
| **1. Air New Zealand** *p.30* | New Zealand | Star Alliance | -ClimateCare and "FlyNeutral" -Permanent Forests NZ Ltd. | New Zealand and other countries Air New Zealand flies to, particularly in the Pacific region. | yes | yes | "20+ years" | yes *extensive see Appendix A |
| **2.British Airways (IAG)** *p.36* | United Kingdom, Spain | One World | -Leapfrog **Carbon Fund | **Carbon Fund to benefit UK, Kenya, and other countries in Africa that the airlines services. | no | yes | "25+ years." | yes |
| **3. Cathay Pacific** *p.42* | China | One World | -FLY Greener | Vietnam, Southern India, China and other countries the airline services. | yes | yes/no | "Since 2007." | yes |
| **4. Emirates** *p.48* | United Arab Emirates | UA Emirates Group | -CORSIA(Carbon Offsetting and Reduction Scheme for International Aviation) | Unknown | no | yes | Unknown | yes *concise see Appendix B |
| **5. Lufthansa** *p.52* | Germany | Star Alliance | -Myclimate (Swiss) -The Climate Protection Partnership | Kenya, Ethopia. | yes | yes/no | "For many years." | yes |
| Lufthansa Austrian | Austria | Star Alliance | -Climate Austria -Luftansa and Fly greener (different than FLY Greener of Cathay Pacific) | Austria, Democratic Republic of Kongo. | yes | yes | "For years now on a wide range of measures." | yes |
| Lufthansa Brussels Airline | Belgium | Star Alliance | -CO2logic | Kenya, Uganda. | yes | yes | "Since 2006." | yes |
| **6. Qantas** *p.57* | Australia | One World | -Fly Carbon Neutral Program -Future Planet | New Zealand, Australia. | yes | yes | "Since 2007." | yes |
| Quantas Jetstar | Australia | One World | -Fly Carbon Neutral Program -Future Planet | New Zealand, Australia. | yes | yes | "Since 2007." | yes |
| **7. Scandinavian Airlines (SAS)** *p.60* | Sweden | Star Alliance | -Natural Capital Partners | Uknown | yes | no | "For decades." | yes *extensive see Appendix C |
| **8. United Airlines** *p.63* | United States | Star Alliance | -Sustainable Travel International (STI) -Carbon Disclosure Project (CDP) -Eco-Skies CarbonChoice | USA, Peru. | yes | yes | Unknown | yes *extensive see Appendix D |

Table 2. Airline Data Table, Hahn, 2018

## Airline Data Details

**1) Air New Zealand,**

**New Zealand, Star Alliance**

Offset Partner Referenced & Claim Pioneer in Environment/Offset Program: The program Air New Zealand advertises is titled Fly Neutral, and is affiliated with the nonprofit ClimateCare. According to its website ClimateCare "has over 20 years' experience delivering award winning programmes for corporate and government clients delivering high quality, integrated sustainability programmes, enabling organisations to take responsibility for carbon and other impacts" ("ClimateCare," n.d.).

Airline Carbon Offset Definition: Air New Zealand defined carbon offsets as,

> Carbon emissions can be removed from the atmosphere by landowners who invest in permanent **forestry projects**. Carbon emissions can also be reduced by creating sustainable, low-energy energy solutions for **communities**. This concept is known as carbon offsetting and the emission reductions generated from these projects are measured and transacted as **carbon credits**. Anyone can purchase carbon credits and use them to offset, or balance, their own carbon emissions. In simple terms, offsetting one tonne of carbon means there will be one less tonne of carbon dioxide in the atmosphere than there would otherwise have been. ("Air New Zealand's carbon offset programme", n.d.)

But during my research window this definition was changed to,

> **A way to reduce the impact your air travel has on the environment is to purchase** emissions reductions from environmentally beneficial projects. Permanent forests and sustainable, low-energy energy projects generate emission reductions that can be measured as carbon credits. These carbon credits can then be bought by customers to address the carbon emissions from their air travel. This concept is known as carbon offsetting. Anyone can purchase carbon credits and use them to offset their own carbon emissions. In simple terms, offsetting one tonne of carbon means there will be one fewer tonne of carbon dioxide in the atmosphere than there would otherwise have been. **Air New Zealand has partnered with ClimateCare to deliver an easy and transparent carbon offsetting programme for our customers**. We want to help our customers take a small action that can lead to great outcomes. ("Air New Zealand's carbon offset programme", n.d.)

This original definition highlights forestry projects and community development as pertinent to the definition of the carbon offset, as well as conflates the term carbon offset with carbon credit, which in its traditional definition is a concept that is slightly different but is related to a carbon offset. Generally, a carbon credit is created only out of a cap-and-trade system and is issued to a company or organization participating in a mandatory national or international carbon market and can also be referred to as a carbon allowance ("How cap and trade works, n.d.). The newer definition is more actionionalbe and fits along with the targeting of the individual as a responsible consumer and the ease to do so as facilitated by the airline itself.

Government Regulation/Policies: On their website, Air New Zealand states that the FlyNeutral initiative operates separately to the New Zealand Emissions Trading Scheme (NZETS) and "funds received from customers for offsetting under FlyNeutral do not go towards our compliance costs associated with the New Zealand Emissions Trading Scheme. We comply with our obligations under that scheme and manage all compliance requirements at our cost" (Air New Zealand's carbon offset programme, n.d.; Cooper, 2018). I deduce the credit as termed by Air New Zealand refers to only the offset for a flight on Air New Zealand only which in other terms is carbon credit for the consumer. This speaks to why Air New Zealand is not targeting the individual as directly as other airlines, which I will discuss further later in this section, and references the collective as they are legally bound to NZETS, furthermore although the consumers purchase of offsets is not currently contributing to the NZETS  this could be an example of the foreshadowing that airlines, which are state regulated in many ways, may be angling to pass off carbon emissions cost to the customer in a non-voluntary manner. This is Air New Zealand's explanation of how the offset works,

> When booking your Air New Zealand flight on our New Zealand website, you can select to offset the carbon emissions from your flight and the cost of the carbon credits will be added to the total amount paid for the flight. If you decide after you have booked your flight that you want to offset it, you can use our carbon offset calculator. ("Air New Zealand's carbon offset programme", n.d.)

The definition lends itself to the theory that the airline is attempting to be vehicle for the customer to take on the bulk of the responsibility.

Location of Offset Program(s): The Air New Zealand carbon offset projects are based in New Zealand as well as in other countries Air New Zealand flies to, particularly in the Pacific region. ClimateCare manages and sources all international projects, all of which address sustainable energy. The following international projects are listed on the ClimateCare page for New Zealand Air: Prony and Kafete Wind Project in New Caledonia working with the Kanak People and The Rural Biogas Programme in Vietnam. All of the projects based in New Zealand, are managed and sourced by a different group, Permanent Forests NZ Ltd, and are related to native forest restoration, the two detailed on their website are Chatham Island Forest Restoration Project and Pigeon Bush Reserve and the Hinewai Reserve. (“Air New Zealand's carbon offset programme”, n.d.)

Airline Emphasis on Individual: The approach that Air New Zealand has taken is focused on ‘we.’ “We all have a carbon impact in today's world. There are things we can all do to reduce carbon emissions”, “We want to help our customers take a small action that can lead to great outcomes” (Air New Zealand's carbon offset programme, n.d.). Like previously mentioned Air New Zealand also stresses community development, although later removed, which implies collectiviness and places more responsibility on the airline itself than others I will explore, but still does mention the customer explicitly, and not unlike most of the airlines on my list, the

carbon calculator directs responsibility to the individual and consumer. Air New Zealand's carbon calculator is visually simple, see Figure 3.

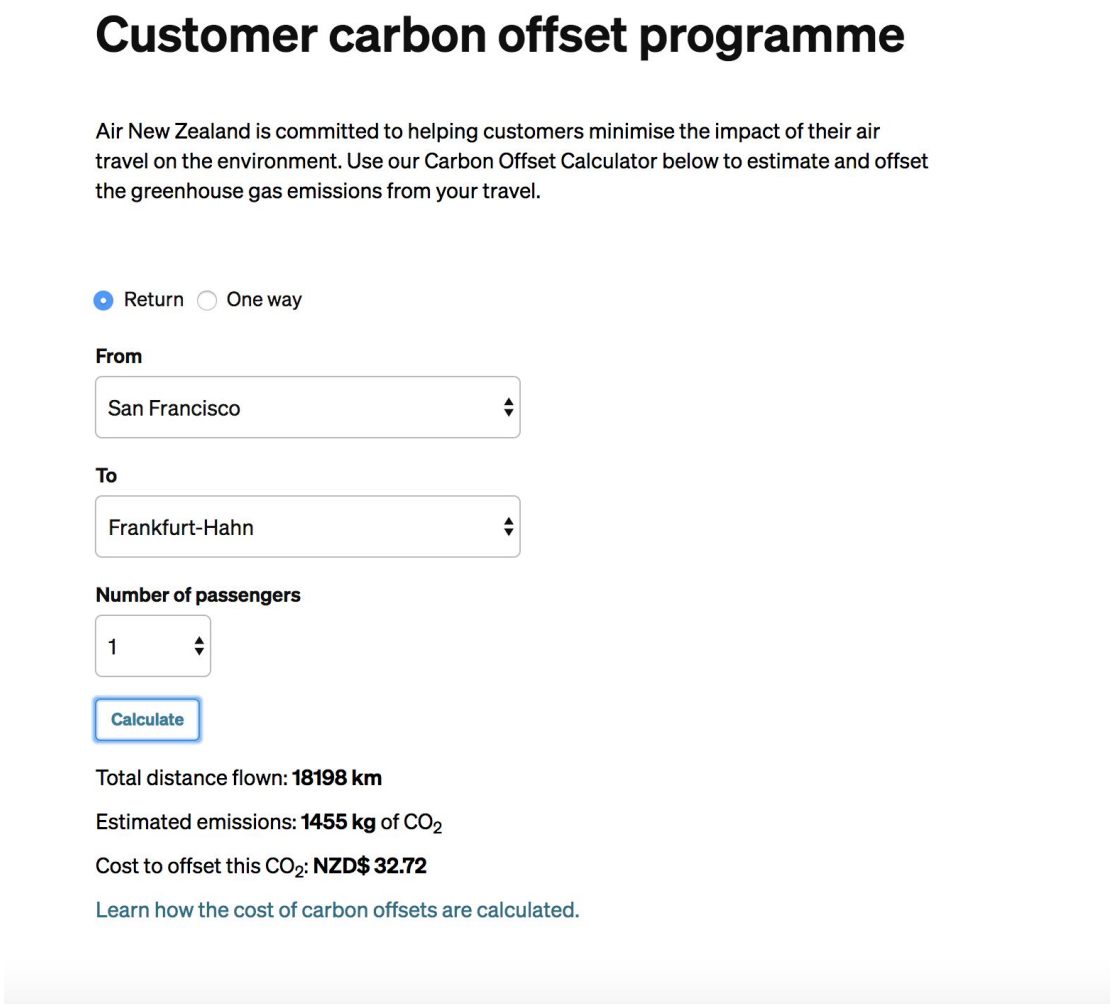


Figure 3. Air New Zealand customer carbon offset programme, n.d., from https://www.airnewzealand.co.nz/loyaltymodule/form/carbon-emissions-offset

Above Air New Zealand's carbon calculator reads, "Air New Zealand is committed to helping customers minimise the impact of their air travel on the environment. Use our Carbon Offset Calculator below to estimate and offset the greenhouse gas emissions from your travel"

(“customer carbon offset programme”, n.d.). This is the most customer-centered language used on any part of their website, remaining unchanged as of October 2018.

Other Environmental Initiatives:

> One of the most significant ways to reduce emissions is by operating a modern and efficient fleet. We were the first airline to take delivery of the revolutionary 787-9 Dreamliner in 2014 and we retired our last Boeing 767 aircraft from our fleet in March 2017. As at 30 June 2018, our 109 aircraft have an average seat-weighted age of 7.5 years. The corporation has made adjustments to ground services emissions encompassing transport, buildings and waste management, as well. (“Air New Zealand's carbon offset programme”, n.d.)

The company stresses that, “even after reducing emissions as much as possible, in many ways it isn't currently possible to eliminate our carbon footprint” (Air New Zealand's carbon offset programme, n.d.). Interestingly this was since removed, which may suggest that they are shying away from the carbon offset approach. Air New Zealand appears to be taking strides and to be proactive in a range of social initiatives including environment, Air New Zealand has an impressive catalog of initiatives all in line with the UN’s Sustainable Development Goals, making it one of the more conscious airlines in my study. (See Appendix A.)

Ownership/Stakeholders: Air New Zealand's site, although slightly not the most user friendly is incredibly robust and transparent. For example they list the ownership information, which allows

conclusions to be drawn on state-private power and accessibility as well as the importance of CSR in the grand scheme, other airlines did not include this information.

The New Zealand Government currently owns 52% of Air New Zealand ordinary shares. The remaining shares are listed on the NZ Stock Exchange (ticker symbol AIR.NZ) and the Australia Stock Exchange (ticker symbol AIZ.AU)

Finally they have a Sustainability Advisory Panel, chaired by Sir Jonathon Porritt, and six external members who "were selected based on the range of skills and expertise we considered necessary to shape and inform a pioneering sustainability agenda" ("Air New Zealand's carbon offset programme", n.d.). Air New Zealand clearly has the desire to share as much information as possible on their website, perhaps due to the states biodiversity and cultural environmental interest it is known for (Smith, 2018). Excitingly and convincingly, Air New Zealand appears to be attacking the issue at hand from many directions and not limited to the carbon offset approach.

**2) British Airways**

**United Kingdom and Spain, One World**

Ownership/Stakeholders: The complicated structure of ownership in international airlines foreshadows challenges in regulatory framework in the future. To contextualize, British Airways is entirely owned by International Airlines Group (IAG) which is headquartered in London, but has globally sprawling scenario, which is only fitting given the name of the group. IAG is

dual-listed on the London Stock Exchange and the Madrid Stock Exchange and since October of 2016, Qatar Airways is the single largest shareholder with a 20.01% stake in IAG (International Airlines Group (IAG), n.d.). IAG has a number of subsidiary airlines one of which is Iberia, a Spanish based airline.

Offset Partner Referenced: Despite its internationally diverse ownership, British Airways has a British-focused CSR program, which speaks to brands being culturally steeped regardless of ownership. British Airways partners with LeapFrog, a non-profit with the mission to, "provide opportunities for communities to own, generate and benefit from clean, green power" which operates 'the Carbon Fund'("Pureleapfrog", n.d.). Through the customer seeking out, applying and inquiring,

> Customers can help us reduce the impact on climate change by donating to the Carbon Fund, which provides funding for community renewable energy projects in the UK and overseas. British Airways customers have supported more than 26 projects so far, impacting the lives of 250,000 people and resulting in community benefits of over £1.5 million. From schools in the UK to sustainable agriculture projects in Kenya, all of the projects provide vital support to local communities and reduce carbon emissions. ("Pureleapfrog", n.d.)

Location of Offset Program(s): As mentioned above the projects vary ranging from, "promoting the use of solar-powered heating and lighting, installing small scale wind turbines for schools

and promoting energy efficient measures such as LED lighting" but from what I have found on the site the majority of the projects are located in the UK and there has been one in Kenya. Examples of projects in the UK are: Plymouth Energy Community; Sustainable Energy for South London installed roof mounted solar PV on two churches in South London; KLAS Care The British Airways Carbon Fund helped fund an energy-efficient community space in a Renfrewshire town; Spelthorne Gymnastics Club relocated to a new site at Bishop Wand Church of England School in Sunbury-on-Thames. And the project in Kenya: helped fund the replacement of a diesel powered water pump with a solar PV powered pump at the Ol Pejeta Conservancy in Kenya ("Pureleapfrog", n.d). In my research, the legacies of British colonialism in Kenya as well as a dynamic around former colonies in CSR could be at play. The British Empire established the East Africa Protectorate in 1895, and Kenya was a British colony from 1920 until 1964. The effects of colonialism are outlined by O Ndege in "Colonialism and its Legacies in Kenya", "Furthermore, Kenya's economy continues to be technologically, financially, commercially and monetarily dependent on Britain, other European countries, the United States of America, Japan and, increasingly, China" (Ndege, 2009). I did email Leapfrog inquiring why British Airways chose to work with Kenya and if they work with any other countries in Africa and the response they gave was that the carbon fund can contribute to countries in Africa that they fly to.

Airline Emphasis on Individual: British Airways has chosen to use the term 'us' often when referring to responsibility of the issue. This puts the individual and the corporation together, not relinquishing all of the responsibility nor claiming it.

Carbon Calculator: No, because they are advocating for the Carbon Fund, and not for VCO.

Government Regulation/Policies: The lack of the VCO and in place the Carbon fund seems most logically due to the UK's policies such as the Carbon Disclosure Project and CORSIA. "IAG (the parent company of British Airways) reports detailed climate and emissions data through the Carbon Disclosure Project (CDP) and is the only commercial airline group in CDP's Climate 'A' list of the top five per cent of global companies. It has also been awarded 'most improved' organisation in the UK in 2017" ("Corporate Responsibility", n.d.). British Airways boasts,

> We were the first airline to participate in carbon trading in 2002 and have consistently campaigned for this policy across the globe. By working collaboratively with governments and our industry associations we helped to develop the first global carbon pricing system – CORSIA. Under CORSIA, airlines will be required to buy carbon offsets to compensate for their growth in CO2 emissions, ensuring collective achievement of carbon neutral growth from 2020. Carbon offsets are generated through the implementation of carbon reduction projects, often in developing countries. ("Corporate Responsibility", n.d.)

British airways displays its compliance with corporate level policies and setting precedents in doing so also in the voluntary sector.

Claim Pioneer in Environment/Offset Program: The British Airways Environmental function was established in 1989, and in their words is seminal, “British Airways has led the way on sustainability for 25 years since we established our Environment function in 1989” (“Corporate Responsibility”, n.d.). And more recently, the Carbon fund and LeapFrog partnership began in 2011 creating, “the first passenger programme to help UK based community energy projects – now known as The Carbon Fund.” (“Corporate Responsibility”, n.d.).

Other environmental initiatives: British Airways lists many other initiatives outside of the environment and there many other environment related ambitions.

> We want to use the power of flight to spread social and economic benefits to people. We want flying to be both an inclusive and responsible practice that is actively involved in caring for our people and our planet. Our corporate responsibility programme is set up to address both our impact on the planet and the people with whom we interact. (“Corporate Responsibility”, n.d.)

The airline breaks down the program into their five pillars/commitments, “ To create sustainable and responsible communities, to promote wellbeing and inclusion, to conduct business responsibly, to reduce British Airways’ environmental impact To reduce waste and improve recycling” (“Corporate Responsibility”, n.d.). The five pillars extend to all corporate social responsibilities.  Further, the airline details ‘Environmental Management’,

> British Airways seeks to conduct business activities in an environmentally responsible manner and is committed to: complying with all environmental legal requirements and other obligations preventing pollution or, where this is not possible, reducing impacts to as low as reasonably practicable protecting the natural environment continually improving our environmental management system and overall environmental performance. (“Corporate Responsibility”, n.d.)

British Airways is thinking of the environment in a broad and somewhat urgent way although perhaps not urgent enough. See Figure 4.

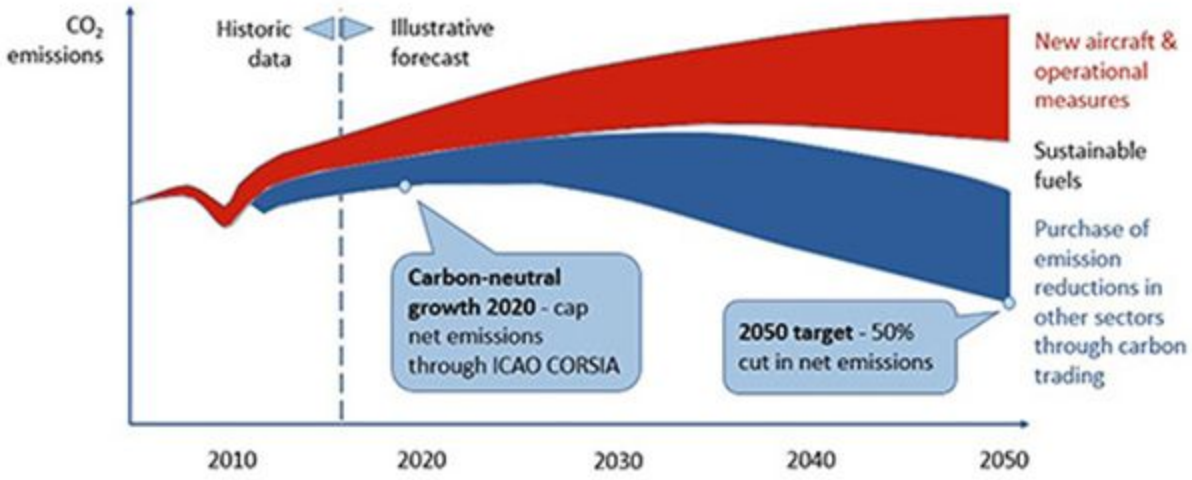


Figure 4. British Airways Carbon Roadmap to 2050, n.d., from https://www.britishairways.com/en-us/information/modalContent/information/about-ba/csr/carbon-roadmap-to-2050.html

In the their roadmap to 2050, “Future growth will be decoupled from carbon emissions by new aircraft, operational efficiency measures, sustainable aviation fuel and purchase of emissions reductions in other sectors through carbon trading, beginning with CORSIA” (“Corporate Responsibility”, n.d.). Most encouragingly they have acknowledged the need to move out of the carbon centric operation, only it needs to be sooner than they have planned for, perhaps this is already on their radar now that the topic has been very recently stressed by the ICCP.

**3) Cathay Pacific**

**China, One World**

Offset Partner Referenced: FLY Greener (“About Fly Greener”, n.d.).

Airline Carbon Offset Definition: The definition of the carbon offset for Cathay Pacific is embedded in the explanation behind the partnership with Fly Greener, “Why Fly Greener ? The logic behind Fly Greener is simple: it helps make sure the CO2 generated from air travel is reduced elsewhere. This is called "carbon offsetting". Through Fly Greener, customers are offered the opportunity to purchase "carbon offsets" that come from projects that reduce or prevent CO2 emissions, such as those focused on renewable energy” (“About Fly Greener”, n.d.). The site underscores that the program is voluntary, and easily transacted through the use of their carbon calculator all while reminding us that the airline does not profit from the exchange at all. It goes further to offer customers the ability to use cash or Asia Miles to purchase offsets or

even, “make a lump sum contribution to reduce their personal carbon footprint” (“About Fly Greener”, n.d.).

Airline Emphasis on the individual: The emphasis on the customer and the individual is seen in the previous section by the repeated used of ‘customer’ and highlighting of personal carbon footprint management. The site never uses ‘us’ or ‘we,’ regarding emissions but they do note that, “Cathay Pacific also takes part in the programme as it offsets the CO2 emissions generated by staff on business travel on Cathay Pacific and Cathay Dragon flights” similar to SAS airlines, which I will cover in a later section (“About Fly Greener”, n.d.).

Carbon Calculator: Yes, also brought up in the definition.

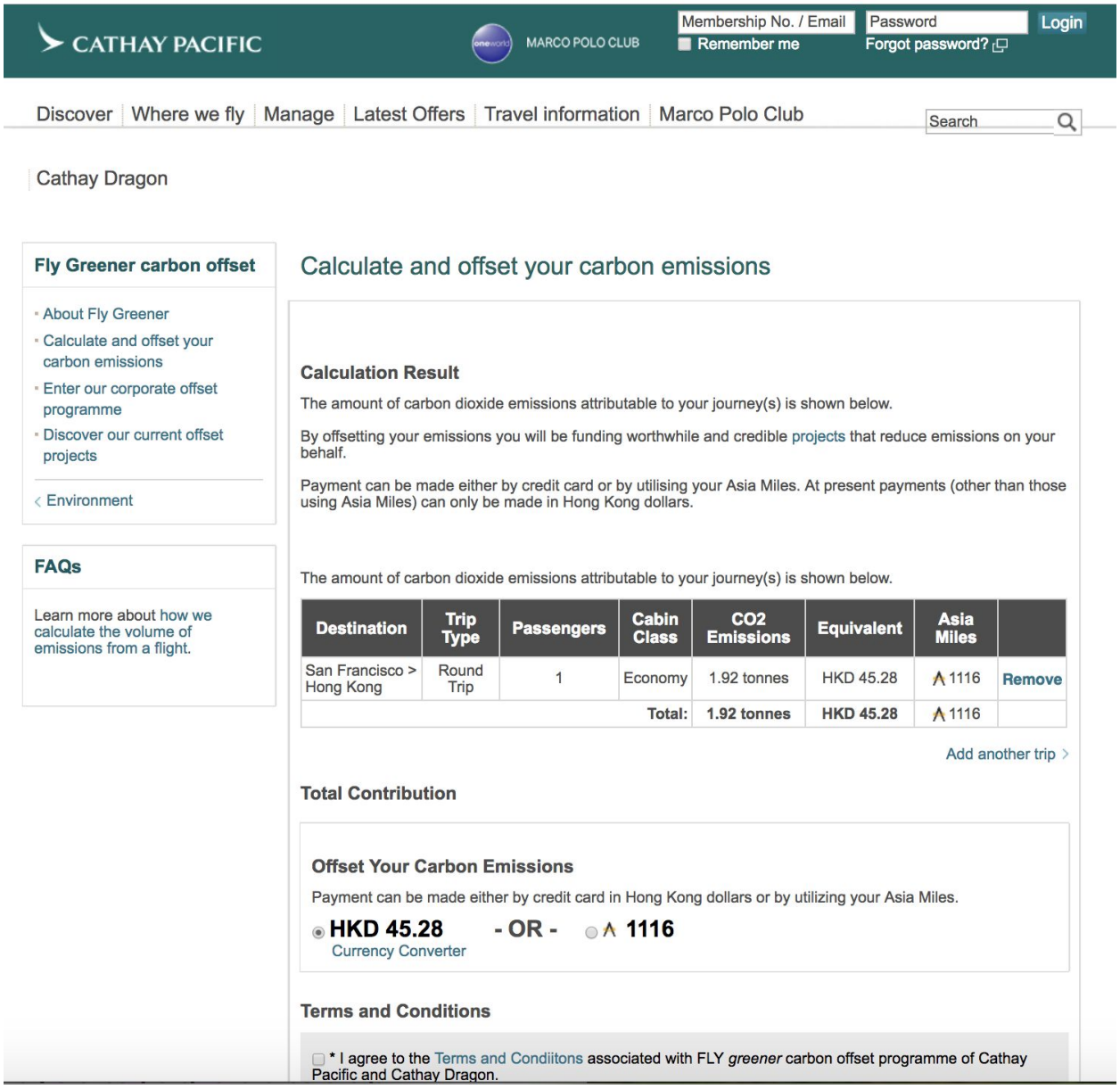


Figure 5. Cathay Pacific Carbon Calculator, n.d., from https://www.cathaypacific.com/cx/en_US/about-us/environment/fly-carbon-neutral-fly-greener/calculate-and-offset-your-carbon-emissions.html

Figure 5., compared with many other figures referenced the reader is given an idea of the aesthetic of the Cathay Pacific's web presence as well as displays the existence of terms and conditions along with the calculator, which is not unique to the FLY Greener carbon offset program. Among other details, the terms and conditions clearly outline that the program is voluntary and addresses that the calculator estimates values, based on historical flight data all while being entirely non-refundable. The final and most noteworthy line of the Cathay Pacific carbon calculator's terms and conditions are the company's sole discretion to choose to use funds on verified emission reductions ("VERs") which they define as projects accredited under the Voluntary Carbon Standard or an equivalent or higher standard. The Voluntary Carbon Standard, was updated to stand for the Verified Carbon Standard since 2011 and is lead by the U.S. non-profit Verra, which in the VCS arm assures quality of voluntary GHG programs (Peters-Stanley, n.d.). Verra claims to be, "The world's leading voluntary GHG program." ("Verified Carbon Standard", n.d.).

Location of Offset Program(s): The airline details two projects in their FLY greener program, the first is in Vietnam and the second is in Southern India, the airline also suggests that these funds are used in other countries they service with a priority to projects in China. The Vietnam project involves converting animal waste into clean energy via biogas digesters. According to the airline,

> rural households in Vietnam keep animals and by installing a biogas plant, any family with several farm animals can create enough energy for their household use. The project

> reduces greenhouse gas emissions by 550,000 tonnes by[per?] year. By reducing the use of fossil fuels and non-renewable biomass, and by preventing animal waste from releasing harmful methane gas into the atmosphere, the project affords massive greenhouse gas reductions, while making sustainable energy and development available to more than 840,000 people. ("About Fly Greener", n.d.)

The Southern India project involves implementing efficient cookstoves to facilitate "more jobs, healthier people and fewer emissions" ("About Fly Greener", n.d.). According to Cathay Pacific,

> The traditional method of cooking over an open flame exposes women and children in southern India to toxic fumes that cause a range of respiratory issues and contribute to approximately 500,000 premature deaths per year in India. These efficient cook stoves reduce smoke and other pollutants by 80% and use less fuel and cook much faster than previous methods. A Women's Empowerment Programme trains female entrepreneurs in marketing and sales of cookstoves to improve their livelihoods and social position in their communities. The project reduces greenhouse gas emissions by 1.5 million tonnes per year. ("About Fly Greener", n.d.)

It is difficult to verify the validity of either of these projects given the information of typical practices, health benefits and carbon reduction is unsupported, but if true the projects clearly align with the mission to produce "real, quantifiable, and permanent reductions in carbon emissions" as well as striving to "select projects that provide added social and environmental

benefits" ("About Fly Greener", n.d.). Similar to almost every airline in my study and explicitly mentioned also by British Airways and Air New Zealand, Cathay Pacific gives preference to projects where they have major operations, hence locally, "We carefully evaluate the sustainability impacts of all our projects and give preference to projects where we have major operations - such as in China" ("About Fly Greener", n.d.).

Government Regulation/Policies: China along with all states represented in my research, besides the UAE and the US, have signed the Paris Agreement ("Paris Agreement - Status of Ratification", n.d.). Since 2011, China established a national carbon market, more specifically, an Emissions Trading Scheme (ETS) in China that would be used as one of the main methods for tackling greenhouse gas emissions. As of 2017 the program has gone national through a gradual rollout process in years prior. The ETS applies initially to the power sector, "including 1,700 stationary sources that emit more than 26,000 tons of carbon annually. This accounts for around 3.5 billion metric tons of carbon, approximately 35% of total national emissions" ("Capacity Building for the Establishment of Emissions Trading Schemes in China", n.d.). The ETS in China is a joint project between the German development Agency, Deutsche Gesellschaft für Internationale Zusammenarbeit (GmbH or GIZ) and the Chinese the Ministry of Ecology and Environment (MEE) of the People's Republic of China. ("Capacity Building for the Establishment of Emissions Trading Schemes in China", n.d.).

> The project is executed on behalf of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) within the framework of the International

> Climate Initiative (IKI). The aim of the project is to strengthen the capacities of China's key institutions and stakeholders for the establishment and implementation of effective emissions trading systems (ETS) on regional and national levels in China. ("Capacity Building for the Establishment of Emissions Trading Schemes in China", n.d.)

Claim Pioneer in Environment/Offset Program: The Fly Greener programme of Cathay Pacific launched in 2007 and according to the airlines website it is the first carbon offset program provided by any Asian airline, as well as the first that allows frequent flyer miles to be used for payment ("About Fly Greener", n.d.).

Ownership/Stakeholders: Swire Pacific, Swire Pacific Offshore Holdings Limited (SPO) - British ("Swire", 2018).

Other environmental initiatives: The website is concise and has few images on the environmental focused pages but cleary covers Cathay's environmental vision that the environment touches many aspects of their operation "operating our flights, managing our infrastructure, interacting with our customers, working with our supply chain and investing in people and communities." ("About Fly Greener", n.d.). They list focusing efforts on climate change, waste noise, air quality, water, conservation and biodiversity. ("About Fly Greener", n.d.).

**4) Emirates**

> **United Arab Emirates, UA Emirates Group**

How is carbon offset defined: N/A

Offset Partner Referenced: CORSIA(Carbon Offsetting and Reduction Scheme for International Aviation) (“Environmental policy | Environment | About us”, n.d.).

Location of Offset Program(s): N/A

Airline Emphasis on the individual: Responsibility is limited, having little to no emphasis on the corporation leaving any implicit responsibility on the customer. Calling upon the Intergovernmental Panel on Climate Change (IPCC) statistic that “aviation (domestic and international) accounts for approximately 2 percent of global CO2 emissions produced by human activity. International aviation is responsible for approximately 1.3 percent of global CO2 emissions” (“Frequently Asked Questions”, n.d.). Despite this fact Emirates states, ”The aviation industry recognises that, although it’s responsible for less than 2% of global carbon dioxide emissions from human activity, it must be committed to growing sustainably and reducing growth of its emissions.” (“Frequently Asked Questions”, n.d.).

Government regulation/policies: CORSIA, which covers international aviation emissions between participating countries, is intended to help achieve carbon-neutral growth by 2020, it

will begin in 2021 in tracking progress after 2020 goals. (“The UAE's response to climate change”, (n.d.).

It is noteworthy that the UAE is a non-Annex 1 country and is not obligated to reduce emissions per the United Nations Framework Convention on Climate Change (UNFCC). However, the UAE has chosen to do so regardless with UAE Vision 2021, which was launched by H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, at the closing of a Cabinet meeting in 2010 and aligns with the future planning sentiment of UAE’s environmental goals and initiatives (“The UAE's response to climate change”, (n.d.).


Figure 6. Emirates National Priorities, n.d., from https://www.vision2021.ae/en/home

Carbon Calculator: No.

Claim Pioneer in Environment/Offset Program: “As a leader in the aviation, air services and travel industries, the Emirates Group recognises that environmental responsibility is core to our long-term business success” (“Environmental policy | Environment | About us”, n.d.).

Ownership/Stakeholders: The airline is government owned, Emirates is a subsidiary of The Emirates Group, which itself is a subsidiary of the Dubai government's investment company, Investment Corporation of Dubai ("Emirates (airline)", 2018).

Other environmental initiatives: Non-time specific goals are listed, but the PDF of their Environmental Policy is appended. The future minded sentiment is echoed on Emirates website, "As a responsible business, effectively managing and continuously improving our environmental performance is important to us" ("Environmental policy | Environment | About us", n.d.).

**5) Lufthansa**

**Germany, Star Alliance**

Offset Partner Referenced: Lufthansa partners with the Swiss non-profit: myclimate. Additionally, they house a second initiative: The Climate Protection Partnership (Myclimate - The Climate Protection Partnership, n.d.).

How is carbon offset defined: Lufthansa has an extensive definition of the carbon offset and weaves in their partners significance throughout. It is most effective to provide the text used on their website,

> "The burning of fossil fuel energy sources (e.g. coal, petrol, kerosene) releases carbon dioxide (CO2) into the atmosphere. CO2 accounts for the largest percentage of the

> greenhouse gases caused by mankind. Each mode of transport which uses fossil fuels to transport persons or goods, generates CO2 emissions. The myclimate website allows customers to make voluntary monetary contributions to climate protection. This amount is calculated on the basis of scientific models and flows directly into certified climate protection projects in which environmentally harmful energy sources (e.g. a power generator that operates on diesel fuel) are being replaced with environmentally friendly energy sources (e.g. a power generator that operates on biomass waste). The majority of such projects are implemented in developing countries as the reduction of emissions is generally more affordable and, in these countries, the volume of environmentally harmful emissions can be reduced on a greater scale for the money that is invested. This means that your contribution is used to greatest effect. With regards to the atmosphere it doesn't matter where in the world climate-harmful CO2 emissions are emitted or reduced,

Which is very interesting as for most airlines location of offsets proves very important,

> For this reason the emission of a given quantity of greenhouse gases, which can not be avoided at one place, can be avoided at any other place in the world. What counts in the end is the balance. It goes without saying that strict standards are applied to myclimate climate protection projects. Besides reducing greenhouse gases, they must also make a demonstrable positive contribution to sustainable development. myclimate pays special attention to ecological and social compatibility, as well as the integrity of the projects, when selecting them. (Myclimate - The Climate Protection Partnership, n.d.)

Although lengthy this definition touches on many important points such as the unavoidable problem and carbon reliant global economy as well as debatable aspects, the investment going to developing countries, and ultimately the standout: the airlines choice to have entirely externally facing projects stresses their view the the carbon offset should take place elsewhere.

Location of Offset Program(s): To install solar lights in place of kerosene lamps, promote solar technician education, and education in Ethiopia and Kenya. Again, extremely notable Lufthansa is the only airline in my study that has entirely externally facing carbon offset programs, but its subsidiaries break that mold. (Myclimate - The Climate Protection Partnership, n.d.).

Airline Emphasis on the individual: Lufthansa proper has less of a focus on the individual or customer than even its own subsidiaries, Austrian and Brussels which I will address in the Ownership/Stakeholder section of Lufthansa below. Lufthansa admits onus, “Lufthansa takes great measures to avoid and reduce emissions. As long as air travel is dependent on the fossil fuel kerosene however, not all CO2 emissions can be avoided. This platform was created in order to give passengers the option of offsetting the unavoidable emissions produced by a flight” (Myclimate - The Climate Protection Partnership, n.d.). There is still much focus on the individual, the use of ‘you, your’ but the admittance of responsibility from the airline is unique.

Carbon Calculator: Yes

Cutting Edge: Here Lufthansa does not go as in depth as other airlines have to claim originality, they put it simply that they have been environmentally minded “for many years”(Myclimate - The Climate Protection Partnership, n.d.). In another section of the site on the broader environmental initiatives lufthansa references having been active on climate and environmental strategy since 2008. (Lufthansa Group AG, n.d.).

Ownership/Stakeholders:


Figure 7. Lufthansa Fleet, n.d., from https://www.lufthansagroup.com/en/company.html

Lufthansa Group AG now owns Lufthansa. Until 1994, the airline was a state-owned enterprise, and flag carrier (Lufthansa Group AG, (n.d.), Company). Deutsche Lufthansa AG shares have been publicly traded on all German stock exchanges since 1966. Additionally, the Lufthansa Group has many regional partners as well as many subsidiaries which include: Eurowings and Germanwings, Swiss and Edelweiss Air, Austrian Airlines and Brussels Airlines. All of which also partner with myclimate and Brussels Airlines which additionally has its own partnership with CO2logic and their green tripper calculator. The sentiment that carbon offsets are better than nothing is valid but at times also enabling, “If someone has to take a flight it is

better to offset it than to do nothing. Your contribution is used to reduce tonnes of carbon in developing countries which match what you emit by flying. These reductions in these developing countries would not happen without your contribution" (CO2 offsetting, (n.d.) but the dynamic with helping developing countries is misconstrued from what was intended by the Kyoto protocol,

> The Kyoto protocol divided countries into two groups. On the one hand, the industrialised countries (Japan, Russia, Australia, EU, United States etc.) historically responsible for climate change. On the other hand, the developing and emerging countries, (in Africa, South America, India, China, etc.) which are not historically responsible for climate change but which increasingly are going to emit CO2 in the future. Carbon emissions are a worldwide problem and the place carbon emissions occur, here or in Africa, makes no difference to their influence on the climate. They therefore have to be reduced here and in those countries. Unlike the developing and emerging countries, here, in the industrialised countries we already have obligations regarding carbon emissions and businesses in our countries are now encouraged to increase their energy efficiency and use renewable energy. We must therefore support the developing (and emerging) countries in changing quickly to the use of sustainable technologies (with a low carbon footprint) otherwise our carbon reductions here will not be sufficient if these rapidly growing countries emit increasing amounts which negatively affect our climate. (UNFCCC, n.d.)

Not only is this information outdated but I would interpret this as a call for common but differentiated responsibilities around limits in the local country, certainly to promote sustainable practices worldwide but to be cautious as to not merely use other countries as a way to bare the burden of the local countries carbon emissions. Brussels Airlines offers projects certified by Gold Standard and/or the United Nations (UNFCCC) and strictly in Africa, considering, "Belgium controlled two colonies during its history: the Belgian Congo from 1885 to 1960 and Ruanda-Urundi from 1916 to 1962" ("Belgian colonial empire", 2018). This adds to the argument that the interest could be correlated. The two projects that are being carried out are in Uganda and Kenya, which is not in the same geographical location as Ruanda-Urundi, which in turn does not support this proposition. Austrian airlines, has  projects in the Democratic Republic of the Congo as well as in Austria, serving as the only AG Lufthansa owned airline that has a local project ("Austrian Airlines", 2018).

Other environmental initiatives: Lufthansa has a fifteen item long list of ways they are working to help the environment, only one, the first on the list, is related to carbon. 1) Reduce carbon emissions 2) Cut nitrogen oxide emissions 3) Modernise the fleet 4) Promote alternative fuels 5) Increase operational efficiency 6) Improve infrastructure 7) Implementation of the global market-based climate protection instrument 8) Continue offsetting carbon emissions 9) Develop further incentive systems 10) Reduce aircraft noise 11) Improve aircraft 12) Optimise flight procedures 13) Develop comprehensive traffic concepts 14) Build green 15) Expand environmental management. Lufthansa also subscribes to the common future planning for 2020 (Lufthansa Group AG, n.d.).

**6) Qantas**

**Australia, One World**

Offset Partner Referenced: Fly Carbon Neutral Program and Future Planet (Homepage, n.d.).

How is carbon offset defined:

> Air travel is a fast and convenient way for us to cover long distances but the planes we fly on release greenhouse gas emissions, which are shown to have negative effects on our natural environment. We've calculated the fuel emissions for each route we fly so you can easily offset your share, helping to counter these effects by supporting projects that affect real change. (Qantas, n.d.)

The website had gone through changes since my original data collection, prior it read,

> We calculate how much carbon dioxide your flight emits into the atmosphere, and then use your contribution to pay an offset project to remove the same amount of carbon dioxide from the atmosphere, or prevent it from being emitted in the first place. (Qantas, n.d.)

The new definition is slightly better but more aviation-sided.

Airline Emphasis on the individual: It is somewhat evident in the airlines definition of the carbon offset, although there the use of ‘we’ as well as also subscribing to offsetting their own company business travel, which makes the case lesser than other airlines in my study but the tipping point to no doubt emphasize the individual is in their ‘when you tick-the-box to Fly Carbon Neutral with Qantas’ marketing campaign. The phrasing of this campaign puts the responsibility on the individual with this specific action on their website, the most direct of any airline in my small sample (Homepage, n.d.).

Location of Offset Program(s): Qantas highlights their commitment and interest in supporting Indigenous groups, specifically “indigenous economic development through our Reconciliation Action Plan, and the promotion and protection of iconic natural places like the Great Barrier Reef. ex. babinda reef project, maori rainforest” (Homepage, n.d.). The listed projects address protection of nature: the Great Barrier Reef project, Babinda reef project, Maori rainforest (New Zealand) and North Kimberly Project dambimangari (Australia indigenous) (Homepage, n.d.).

Government Regulation/Policies: The airline claims that they go beyond what is required of the National Carbon Offset Standard (“NCOS”). (Qantas, n.d.)

Carbon Calculator: Yes.

Claim Pioneer in Environment/Offset Program: "Our offsetting program is the largest of any airline" and has been operating since 2007. (Qantas, n.d.)

Ownership/Stakeholders: Qantas owns Jetstar Airways, a low-cost airline that operates both international services from Australia and domestic services within Australia and New Zealand the airline also holds stakes in a number of other Jetstar-branded airlines (“Qantas”, 2018).

Other environmental initiatives: Qantas has extensive environmental initiatives. “Qantas Future Planet, our flagship program for our environmental initiatives, is made up of six key areas of focus, from fuel efficiency, to sustainable products” The six areas seen below: Fuel efficiency, Aviation biofuel, Carbon offsetting, Sustainability insights, Waste energy and water and Protecting against pollution (Qantas, n.d.).

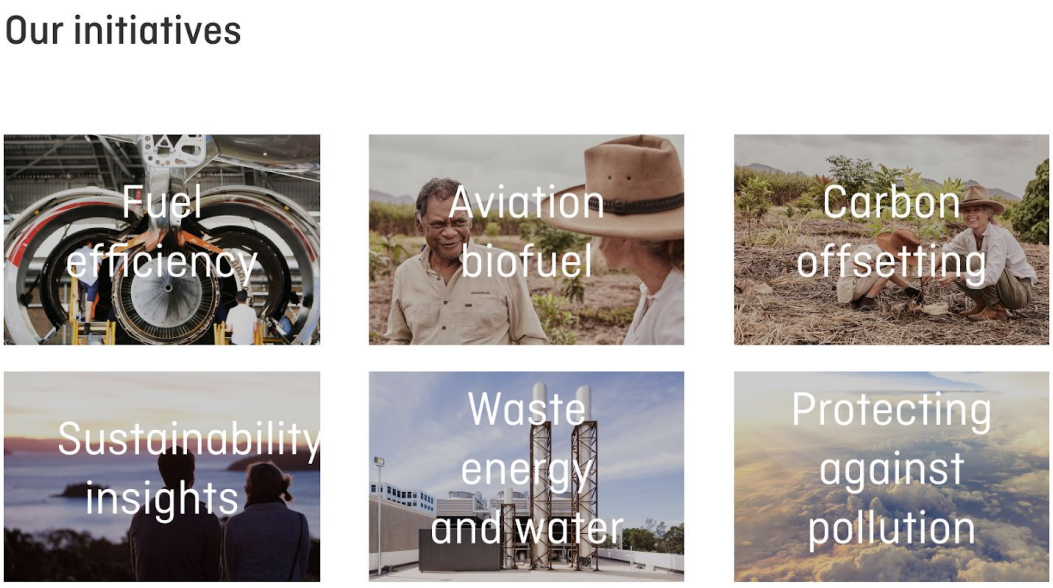

Figure 8. Qantas Our Initiatives, n.d., from

https://www.qantas.com/us/en/qantas-group/acting-responsibly/our-planet.html

**7) Scandinavian Airlines (SAS)**

**Sweden, Star Alliance**

Offset Partner Referenced: Natural Capital Partners (SAS, n.d.).

How is carbon offset defined: The carbon offset is not explicitly defined by SAS, this could be due to the lack of focus on the initiative. Rather the website details, "SAS offers you the opportunity to compensate the CO2 emissions from you flight to net zero, helping towards making it a Carbon Neutral flight" (SAS, n.d.). The airlines seems admirably focused on the future option of using renewables, "Within shortly we will add the offer to upgrade the fossil fuel consumption to renewable" (SAS, n.d.). Based on this claim, their outlook is by far the most cutting edge, emphasizing innovation away from carbon and carbon offsets.

Location of Offset Program(s): This information is not available on the company website, I emailed their environmental department inquiring but have yet to receive a response.

Airline Emphasis on the individual: SAS does not put much emphasis on the individual and takes much of the responsibility as the airline, " SAS believes it is our responsibility to stay ahead in order to reduce our environmental impact"(SAS, n.d.). Similarly to Qantas, SAS offsets all

business travel of their employees, and further they offset all youth tickets, “The CO2 emissions that occur when flying can be compensated for with the help of established offset solutions. At SAS, we CO2-compensate all youth tickets as well as our own business trips” (SAS, n.d.).

Government Regulation/Policies: According to the website, “SAS’ environmental responsibility is to comply with relevant legislation as well as to ensure as low as possible total long and short term emissions and other environmental impact” (SAS, n.d.). In support and to detail further what this means,  Sweden as a state is regulating carbon and promoting the use of biofuels (Afp, 2018). On the website SAS endorses IATA’s vision to fly commercially without a climate impact by 2050. “This vision is to be realized through a combination of new technology, more efficient air traffic management, new fuels and coordinated actions to improve the infrastructure and the conditions under which air transport operates” (SAS, n.d.). Again the focus is not on carbon offsetting but the steps that follow in mitigation rather than adaptation.

Carbon Calculator: Yes. The information provided by the airlines is to use the calculator to measure “how much CO2 your flight with SAS generates” (SAS, n.d., “Emission Calculator and Carbon Offset”). This speaks further to the responsiblity that SAS is taking. Their claim that “The emissions calculator is a natural step in that direction” speaks to the innovation, viewing carbon offsetting as more of a means to and end, again the best take on carbon offsetting I have seen in my project. (SAS, n.d., “Emission Calculator and Carbon Offset”).

Claim Pioneer in Environment/Offset Program: “For decades, SAS has worked with reducing its impact on the environment” (SAS, n.d.).

Ownership/Stakeholders: SAS Group: The Swedish government has a 17.1% stake in the company and the Norwegian government has 11.5% stake and the Danish government a 14.2% shareholding. The remaining percentage is privately held (Chopping, 2016). According to Bloomberg, there has been report of Lufthansa being interested in investing in SAS (Katz, 2016).

Other environmental initiatives: The specifics of SAS’ wider environmental goals are ambitious: “Reduce flight emissions by 20% in 2020 compared with 2010. Reduce noise emissions on take-off by 15% in 2020 compared with 2010. Regularly use renewable jet fuel in 2020” (SAS, n.d.). The site displays the the information in such a way that it is clear that SAS is aware of how soon these goals need to be carried out and that they are on track. The bar they have set to improve based off of 2010 metrics is challenging but hopefully attainable. Nonetheless the airline is transparent about a fact that often defines CSR but is rarely acknowledged, the investment for the return, “For SAS, sustainable development means a simultaneous focus on financial, environmental and social responsibility. The objective is to contribute to the creation of long-term growth in shareholder value” (SAS, n.d.).

**8) United Airlines**

**United States, Star Alliance**

Offset Partner Referenced: Sustainable Travel International (STI) Eco-Skies CarbonChoice, United explains how they settled on STI after reviewing "a wide range of carbon offset providers" because of "its international focus, excellence of mission and high standards, which make the organization a good fit for United and our customers. We also value Sustainable Travel International's policy of only selecting carbon offset projects that have obtained independent third-party verification and are registered with long-standing and well-respected carbon quantification protocols" ("CarbonChoice carbon offset program", n.d.). Slightly outside, but still very closely related in the realm of carbon offsets United is involved with the Carbon Disclosure Project (CDP), which is another non-profit partnership. The CDP is centered around measuring an entity's impact, to serve as a tool for finding improvements ("CarbonChoice carbon offset program", n.d.).

How is carbon offset defined: United defines,

> "Carbon offsetting is a process designed to alleviate the impact of greenhouse gas emissions that result from the use of fossil fuels by reducing emissions from another source. Through this process, United customers now have the opportunity to offset the carbon emissions resulting from their travel by making tax-deductible charitable contributions to a variety of independently reviewed and certified environmental projects focused on forest conservation, renewable energy and avoided deforestation. ("CarbonChoice carbon offset program", n.d.)

Like many airlines in my sample United weaves in and focuses on the opportunity they offer to their customers to offset. “After you book your flight, you will be given the option to calculate your emissions and offset your carbon, or you can simply visit our carbon offset website and enter either your itinerary information or a dollar amount that you’d like to contribute” (“CarbonChoice carbon offset program”, n.d.). As explained, the option is automatically available after booking a flight as well as on a separate page.

Location of Offset Program(s): The first of two projects offered by United is supporting the Capricorn Ridge Wind project which helps displace fossil fuel-based energy production with clean, renewable wind power in the state of Texas in the US. “This project produces enough wind-based electricity to power approximately 220,000 homes annually and is an independently verified carbon offset project registered with the Verified Carbon Standard” (“CarbonChoice carbon offset program”, n.d.). The second is Conservation International's Alto Mayo Forest Carbon Project in northern Peru which “helps to protect a critical watershed for more than 240,000 people and many threatened species found nowhere else on Earth. The project also provides jobs for local families and incentivizes new approaches to farming that support rather than undermine native forests” (“CarbonChoice carbon offset program”, n.d.).

Airline Emphasis on the individual: ‘You, your’ are in the definition. United does not merge the customer with the company as a collective goal, but separately speaks about the airline’s

responsibility and more frequently attributes responsibility the customer. The view that United is offering a platform for the individual to use to make a difference is implied.

Government Regulation/Policies: United projects are independently verified though REDD+ and are registered under the Verified Carbon Standard (VCS), for further information reference above the Cathay Pacific section in which I describe VCS further, as Cathay Pacific is also using the standard ("CarbonChoice carbon offset program", n.d.).

Carbon Calculator: Yes.

Ownership/Stakeholders: United Airlines, Inc. is a subsidiary of United Continental Holdings, Inc. (Bloomberg, 2018).

Other environmental initiatives: In the words of United Chief Executive Office, Oscar Muñoz,

> Innovation and sustainability are twin engines that drive our progress as the most environmentally conscious airline in the world. United is committed to innovating solutions that we hope will become the expectation for our industry, not the exception. The measure of our success is the opinion of our children and grandchildren who will look back on our efforts and say that we lived up to our obligations to them in protecting the planet for future generations. (Eco-Skies Commitment to the Environment, n.d.)

The CEO claims that United is the most environmentally conscious airline in the world and comments on the importance of facing environmental issues for future generations. United details their initiative titled ‘eco-skies’ in which carbon offsets are only one of many initiatives (Eco-Skies Commitment to the Environment, n.d.). The image below, a screengrab from United’s website details additional commitments: fuel efficiency, sustainable products and materials management, sustainable fuel sources,  and Eco-Skies partnerships.

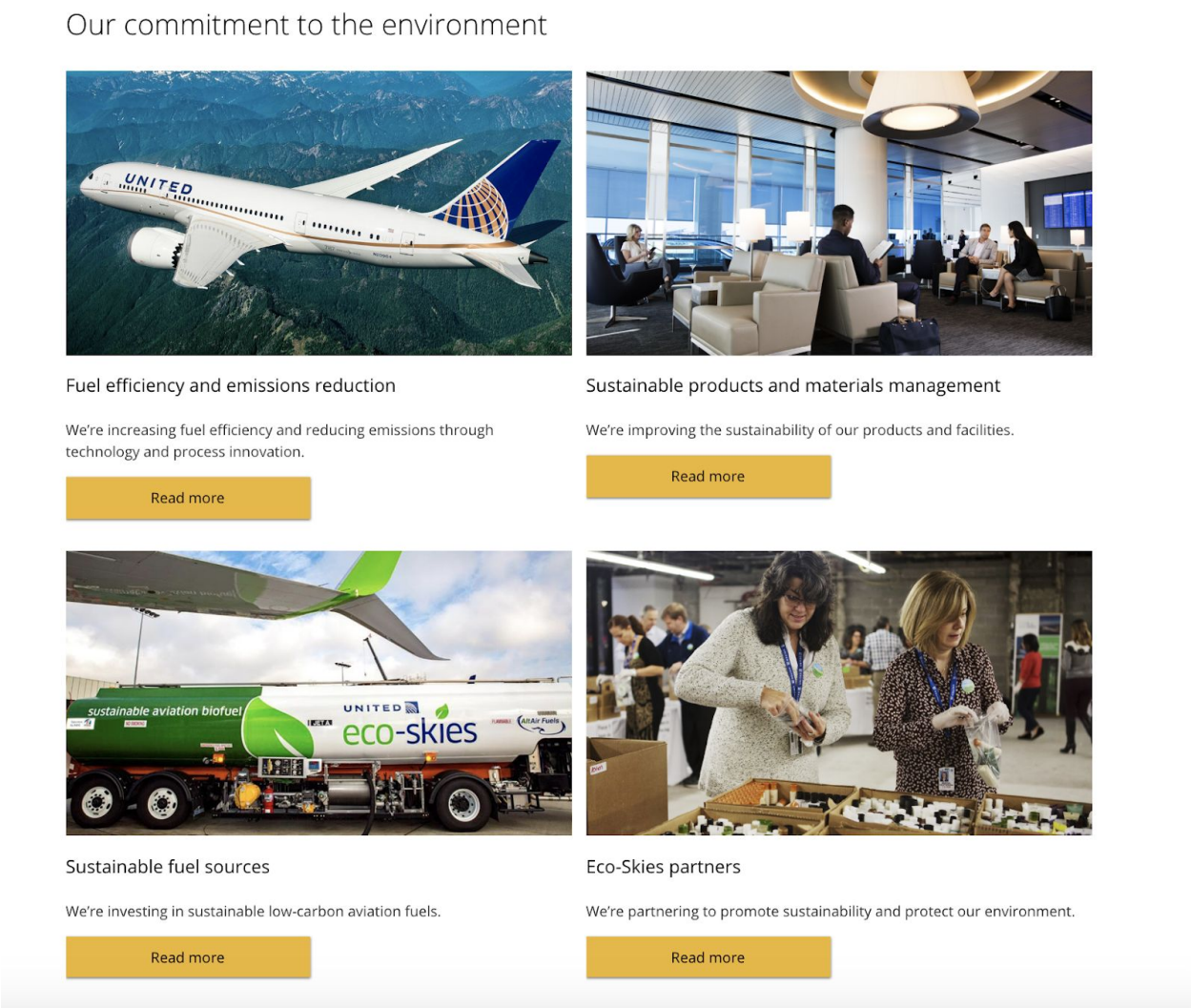


Figure 9. United Our Commitment to the Environment, n.d., from https://www.united.com/ual/en/us/fly/company/global-citizenship/environment.html

# CHAPTER FOUR: CONCLUSIONS AND FURTHER RESEARCH

VCOs are not the long-term answer. Corporations have taken it upon themselves to define their own environmental initiatives, arguably the most important aspect of society today. Although the response of VCOs and CSR, which is likely due to the symbolic and norm creating nature of non-enforceable binding international agreements, is encouraging, states remain critical actors in creating and enforcing environmental regulations. Among the airlines whose VCO programs I inventoried exists a variety of good to poor examples of environmental initiatives, surprisingly many of the other environmental initiatives and plans have promising goals beyond or after the VCO. The best of which was SAS, who is channeling CSR bandwidth on technology and moving away from fossil fuel, which is correlated with the state's demanding initiatives.

Within the VCO, which can be positive in the short term, and better than nothing I was able to understand the way in which factors such as: Airline Country of Origin (HQ), Alliance, Offset Partner Referenced, Location of Offset Program(s), Carbon Calculator, Airline Emphasis on Individual, Claim Pioneer in Environment/Offset Program, other Environmental Initiatives summarized in Table 2 interact. Notable examples being: the Lufthansa case, which shows that less emphasis on the individual is correlated with having externally located offset projects. And the similar cases of British Airways, Air New Zealand and Cathay Pacific supporting that the individual emphasis and the interest of national projects go in tandem. Neither of which examples was I expecting. Prior to my research I incorrectly anticipated that airlines that take more responsibility would also want to focus on their nation, but give the my data, it is

individuals have expressed the desire to be national and airline responsibility has interest to have projects externally, perhaps this has to do with global competition. Further research on this theme is needed as well as more studies to understand whether local or external carbon reducing projects are better or worse or neither, regardless of negative impacts we know of embedded in their essence.

How will all countries become invested in the environment? What would common but differentiated responsibilities look like? I do not foresee all countries being willing to join the movement until there has been some sort of technology that can be easily adopted and applied in many contexts. Although I wish VCOs were the answer and could perhaps be useful if the concept were reworked to incentivize a means for innovation in the airline industry rather than a means to more quickly and cheaply comply with aggressive and unrealistic emissions goals. VCOs do not actually reduce carbon emissions but actually enable emitters to emit more. The carbon offset is a fallacy. Reducing carbon in one place does not get you a get out of jail free card in another. Reducing carbon elsewhere may be good and positively VCOs fund certain clean energy or more sustainable practices across the globe, but that does not leave room for more emissions, there is no true neutralization occurring, rather a distraction especially if not abiding by additionality. It is also argued that carbon offset projects can actually be harmful to communities and potentially force people to assimilate to mostly Western practices. And the organizers have the capacity to neglect projects and not see through the entirety of a project's duration (Miller, 2012).

Broad continued research on the topic would include a larger sample size and other industry examples as I was not able to generalize from my study. Although I was able to make a

few comparisons, they were not the focus of my study. I was able to become expert and understand what exists as far a VCOs in the airline industry. Specific research on the connections of the state and environmental policy and supranational policy and norm influence within and/or outside of the aviation industry would be helpful in moving forward towards creating climate solutions. Applied research on insights on state policy drafts and implementation or how to pivot carbon markets to incentivize technology and solutions would also be incredibly useful. Lastly, outside of the field of International Studies, research in technology and innovation for climate solutions are paramount. I plan to use knowledge from this research to better my future workplace(s) and affiliations, to suggest implementation of well thought out carbon offset programs, intention around the environment and other social issues, and a revolving green fund, which I see as better and a necessary supplement to carbon offsets.

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APPENDICES

Appendix A: Air New Zealand

2018 Sustainability Report

Appendix B: Emirates

https://www.emirates.com/english/about-us/environment/environmental-reports.aspx

Appendix C: SAS

https://www.sasgroup.net/en/sas-sustainability-report-2016-2017/

Appendix D: United Airlines

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