AIRLINES SUSTAINABLE BUSINESS MODELS

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Please cite this paper as:

Pietreanu, C.V., Zaharia, S.E. and Pavel, A.P., 2020. Airlines Sustainable Business Models. In: R. Pamfilie, V. Dinu, L. Tăchiciu, D. Pleșea, C. Vasiliu eds. *6th BASIQ International Conference on New Trends in Sustainable Business and Consumption.* Messina, Italy, 4-6 June 2020. Bucharest: ASE, pp. 587-594

Abstract
The paper presents a research on airline competitive sustainable strategies in the context of globalisation, green marketing and sustainable air transport market. These strategies are mainly based on investments in new environmentally friendly technologies, ancilarry revenue diversification and opportunities offered by new operational procedures, taking into consideration the European Strategy Flightpath 2050. The target group of analysis contains airlines from Europe, North America, Australia and Asia, from legacy and low cost business models. The specificity of each model is analyzed taking into account common and distinctive indicators, capabilities and major contributors to the airline environmental consciousness. The authors study how the changes in sustainable business models have introduced essential alterations in the aviation industry and analize the phenomenon of "greenwashing" that amends the passenger perception of an airline brand. Finally, the paper exhibits if the changes brought by airline strategies for becoming environmentally friendly bring higher incomes or not. Future demands take into consideration innovative solutions for sustainable business commitment as a way to educate passengers.

Keywords
Airline management, environmental protection programs, green marketing, LCC, legacy airlines, smart environmental standards, sustainability.

JEL Classification
C80, D40, F64, L11, L93, M31, R40

Introduction

This research concerns an analysis of green strategies used by airlines for sustainability development parallel with "green marketing" success. The phenomenon is analyzed in depth, based on a detailed examination of airlines' reports and international rankings. In order to provide a thorough understanding of airlines adaptations to green marketing, data was collected from international regulatory authorities and environmental organizations or groups, but also from academic sources. After examining different emission trading systems and

offsetting schemes, the authors use quantitative and qualitative methods to assess the impact of technological solutions as drivers of change toward greener solutions but also "eco-friendly" marketing management or air transport business success. In this context, sustainability solutions, process adaptations and the communication of air transport providers, but also consumer scepticism is assessed. Indicators related to environmental effectiveness are reviewed, parallel with revenues and other key indicators, since they provide a clear image of the green marketing programs' impact on customers. Thus, the methodology combines analysis of primary and secondary data, comparative studies and surveys in order to maximize the utility of information and the study results.

The criteria for choosing the analysed target group were: relevance of airlines on the air transport market; relevance of their efforts to reduce environmental impact; geographical area (majority from Europe, but also one from North America, Asia and Australia, which have an important number of flights in Europe; belonging to both LC and LCC business models). After a study of the sites (Alternative Airlines, 2020) and (AirHelp, 2019), the target group contains the following airlines from LC model: Delta Airlines, British Airways from IAG Group, Lufthansa from Lufthansa Group, KLM from Air France-KLM Group, Cathay Pacific and Qantas, and two LCC: Ryanair and EasyJet (Table 1).

Table no. 1 Target group of analysis characteristics (data from 2019)

Airline	Airline type	Pax. number (millions)	Pax. experience ranking	Sustainability ranking
Delta Airlines	LC	204	17	3
Ryanair	LCC	146	68	9
Lufthansa	LC	145	24	2
Easyjet	LCC	91.6	71	7
Qantas	LC	55.8	5	13
British Airways	LC	46.8 (2018)	23	11
Cathay Pacific	LC	35.2	n.c.	8
KLM	LC	35.1	12	4

Source: based on data from AirHelp 2020, 'AirHelp Score 2019', AirHelp, 2019

Competitive management strategies for sustainable development of legacy and low-cost carriers' business models in the context of airline sustainability

The general strategies of airlines for becoming eco-friendly consist in the following categories of solutions: collaboration, innovation, alternative energy, on route efficiency, efficiency on the ground, employees, building and construction, step-change technology and carbon management. At same time, the airlines focus on their eco-friendly marketing strategy for becoming a "green brand" (Fig. no. 1).

Airlines' strong performances reflect their yearning to be on the top of the rankings and in passengers wish. Their key focus is the improvement in revenues, but taking into consideration the competitive aviation market, each airline should develop successful initiatives to the benefit of their capacity growth. In this analyse, the authors will focus less on the technical and operational solutions, but on airlines' green marketing in order that the passengers who get more environmentally conscious, know which airlines are taking the steps to improve their (and their customers') carbon emissions. The question is whether green marketing of airlines reflects reality or says more than it really does.

The general strategy of LC and LCC is to combine the main levers that bring financial profit with the sustainability actions that bring more image profit. For financial profit, for example, LCCs rely on low ticket prices and strong auxiliary revenues, stimulating in this way demand growth (Pietreanu et al., 2019). Ryanair, Europe's lowest cost airline, had a total revenue of

7,697 million € at the middle of 2019 (6% increase from 2018), from which 2,436 million € from revenue services (a rise of 11% per passenger) (Ryanair, 2019). In parallel, Ryanair is well ranked from sustainability criterion (Table 1), being on 9th place.
For EasyJet, in 2019, the revenues (£1,124 million) increased by 9.7% from 2018, and so did the ancillary revenues (£301 million, with an increase of 10.8%) and the total profit before tax fell to £430 million (EasyJet, 2020). These performances were reached with important efforts; assessment of the impacts of different policies, diversification of tariffs and services, analysis of consumer behaviours or competitively sustainable planning (Pietreanu et al., 2019). Consequently, Easyjet's carbon offsetting program mirrors a reduction of 800k tons of carbon so far. The company takes all its merits and self-proclaims "the industry leader in sustainability" since it's "9 mil passengers flew net-zero carbon flights" (EasyJet, 2020). They declare that their sustainable growth is supported by a responsible way of doing business.

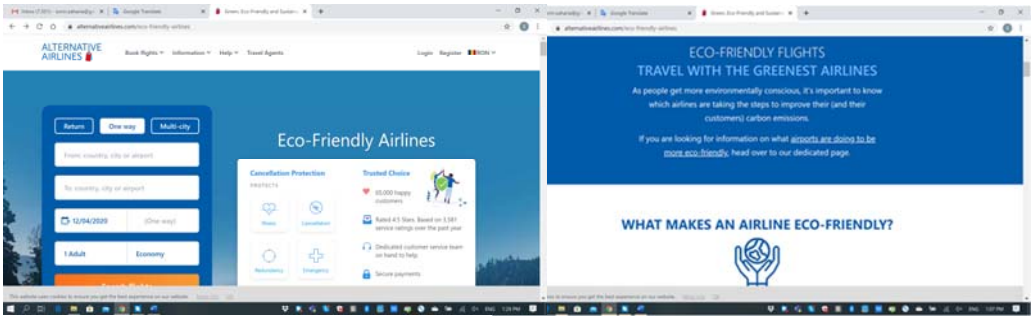

Fig. no. 1 The web site "Alternative airlines" for promoting eco–friendly airlines
Source: Alternative Airlines 2020 -'Eco-Friendly Airlines', Alternative Airlines, 2020

LCC emphasizes on minimizing costs, while legacy airlines on the quality of their services. The question is if the typical characteristics of legacy carriers regarding the provision of higher quality services can also be reflected in offering an improved sustainability program. For example, in 2019, the legacy airline Qantas which is Australia's flag carrier operated the first-ever worldwide commercial flight to produce no deposit of waste.
Regardless of the airline's business model and particularly green initiatives for reducing the footprint on environment, all air transport providers have to comply with environmental regulations, work with suppliers and the government for a market-based approach to pollution minimization and develop offsetting schemes. Governments and international organizations do not cease to provide new and more stringent regulations; the Paris Agreement limits global temperature rise to less than 2°C above pre-industrial levels and IATA's 2050 target is for an aviation that emits a net 50% less CO_2 against 2005 levels. The intenational body ACI, launched a marketing competion: "Low carbon acreditation".
One of the most important actions for reducing the footprint on environment is to have a younger fleet equipped with new aircraft that pollute less. For example, EasyJet was investing in new generation aircraft (A320 familly), which are more fuel efficient and environmentally friendly, leading to lower operating costs and lower carbon emissions over time (15% less) with an average age of the fleet of 7.4 years. Furthermore, EasyJet is developing electric aircraft for short-haul routes, having 2030 year term. In the same sense, Ryanair is purchasing €20billion worth 737 Boeing in order to lower emissions by 16% per available seat and also to reduce their noise footprint by 86% with the introduction of the Boeing 737-800NG. Aviation is the most efficient form of mass point-to-point transport, accounting for just 2% of EU man-made CO_2 emissions. Even as a very small part of a big problem, aviation must play its role in addressing climate change; and Ryanair, as Europe's largest and most successful

airline, is committed to leading the way. Airlines succes in environmental protection is closely linked to main aircraft manufacturers. Considering the investments in new environmentally friendly technologies, the A350 XWB aligns to the requirements of increasing environmental concerns, the effectiveness of fuel economy, but also passenger expectancies (Edge et al., 2010). The landing/take-off cycle CO_2 emission factors are presented below for different aircraft types (Table 2):

Table no. 2 Landing and take-off CO_2 emission factors per aircraft type

Aircraft type	CO_2 LTO emission factors/aircraft [kg/LTO/aircraft]	Fuel consumption [kg/LTO/aircraft]
Boeing 737-300/500	2480	780
Boeing 737-700	2460	780
A320	2440	770
A321	3020	960
A330 200/300	7050	2230

Source: based on data from ICAO, ICAO Doc 9889 Airport Air Quality Manual, ICAO, 2011

Also, by flying more efficiently, cost savings to airlines and potential savings in CO_2 emissions (i.e. 14.3m metric tons from 2020 to 2030) can be reached by the implementation of automatic dependent surveillance–broadcast (ADS–B) technology (Marais, 2016). ADS-B technology provides a more accurate report of an aircraft's position, which allows smaller separation standards than it was previously possible to do in a safe manner, and this reduces the amount of time aircraft must spend waiting for clearances, being vectored for spacing and holding, with a beneficial impact in reducing pollution and fuel consumption.
Aside from investments in new environmentally friendly technologies, airlines are concerned about promoting ancillary revenues and loyalty programs, for developing a better relationship with passengers. Each of these directions can be transformed in smart environmental targets in order for an airline to become a "Green brand". Although most of the people can not establish a connection between ancillary revenues and environmental protection, it seems that a simple choice of an ancillary service, like the selection of the class cathegory seat in the aircraft can reflect in passenger's sustainability commitment. Business or first class passengers have a higher carbon footprint, since these classes mirror a lower RPK results in a higher amount of CO_2 per passenger. (The Guardian, 2010) shows that a British Airways B747 provides 0.66 sq m. per economy seat, while business and first class seats have 2.3 sq m., respectively 3.6 sq meters. This translates in 3.5 times increase in CO_2 footprint for business class and 5.5 times for first class than a seat in economy class.

Airlines sustainable business commitment
Airlines have developed different interesting societal sustainability programs that became bright marketing strategies. KLM Royal Dutch Airlines launched in 2019 a campaign called "Fly Responsibly" in which it urges its passengers to "Fly less", suggesting them to be more responsible and protect the environment. More so, the airline seemed to be requiring the passengers not to fly: "Could you take the train instead?". The approach can be considered by some to be laudable, because a 2020 report made by FlyGreen shows that a trip by train from Amsterdam to London saves up to 90% of the CO_2 emissions produced by a flight on the same route (FlyGreen, 2020). But, as (Zetlin, 2019) shows, this is just a "Greenwashing" strategy, with the purpose to place the airline as an environmentally friendly one, which is (partially) a false information. Surely, lately, all airlines, regardless of if they are legacy, LCC or charters, develop grandiose sustainable programs, but the question is whether their intentions are to provide green solutions for the industry, or this is just a marketing spin. In airlines' annual

reports, the environmental policy occupies a large volume. For example, Ryanair in his 2019 Annual Report affirms that: "As well as being Europe's favourite airline, with the best customer service, Ryanair is Europe's cleanest, greenest major airline". Out of real solutins for becoming an eco-friendly airline, Ryanair's Report contains also provocative statements "To deliver on our environmental commitment, Ryanair has announced a 2030 carbon efficiency target and an absolute climate target for 2050" (Ryanair, 2019), which cannot be fully guaranteed, but are very good for their green brand.
The following table shows the most representative green solutions of analyzed target group.

Table no. 3 Airlines sustainability involvement

Airline	Vision	Goals	Actions
Delta Air Lines (DL,DAL)	Become first carbon neutral airline globally	•Focus on hazardous waste. Implement a recycling program	• Developed a flight weather app • Buy 50,00 carbon offsets and remove 300,000 pounds plastic waste/year
Ryanair (FR/RYR)	Be the greenest, cleanest airline in Europe	• Go plastic free by 2023;15% emission reduction by 2030	•Launch a leading offset program •Lower fuel consumption and noise emissions
Lufthansa (LH/DLH)	Maintain balance. Out of responsibility	•1.5%/year energy efficiency increase •50% reduction in CO_2 emissions by 2050	•Replace 4 engine aircrafts with twin-engine for long and short-haul flights •Reduce kerosene consumption and promote alternative fuels •Eliminate unnecessary flights detours
Easyjet (EC/EJU)	Nil	•Produce up to 50% lower NO_x emissions •Use 50% quieter aircraft than previous generation	•Offset the carbon emissions from fuel used for all flights •Reduce the amount of plastics used •Invest in new generation Airbus A320 neo and A321neo
Qantas (QF/QFA)	Become the leading airline committed to sustainability. Fly greener	•Eliminate 75% of the waste that they produce •Reduce energy consumption by 20% •Cut net emissions by 50%	• Eliminate single-use plastics within all of their flights •Encourage passengers to use electronic boarding passes •Reduce fuel use and greenhouse gas emissions • Aircraft weight reduction initiatives
British Airways (BA/BAW)	Become the first UK airline to reduce carbon emissions on domestic flights	•Decrease the amount of noise •Improve air quality •Adjust take-off and landing procedures to minimize emissions	• Environmental legislation compliance •Invest > £20b in environmentally friendly and efficient aircraft •Create eco-friendly amenity kit within their World Traveler Plus Cabin • Transform waste into jet fuel • Invest in efficient ground vehicles
Cathay Pacific (CX,CPA)	Minimize environmental impacts	•Focus on climate change, biodiversity and conservation	• Develop "Fly Greener" programme • Urge the passengers to purchase carbon offsets for their journeys
Air France-KLM (AF/AFR) (KL/KLM)	Protect the planet. Contribute to the UN Sustainable Development Goals	•Reduce the amount of CO_2 emissions by 20% per passenger in 2020 •Improve the overall energy efficiency	•Buy new fuel-efficient aircrafts •Replace Boeing 747 with Boeing 787 Dreamliner •Create flights which are driven by biofuel rather than jet fuel •Promote alternative transport modes

Source: based on data from Matrix, 2020. Airlines sustainability commitment (Matrix, 2020), and Spohr, C., 2019. Sustainability Report 2019, Spohr, 2019

Table 3 presents different views and strategies towards the minimization of environmental impact of air travel; actions supported by airlines' complying with environmental legislation. Each of them have one thing in common: to replace their fleet with more efficient models. The figures may indicate that legacy airlines develop their mission to protect the environment with more attention and care than LCCs.
An Eurocontrol report from the end of 2019 indicated that Ryanair is the 5th airline regarding CO_2 emissions. But, beeing the top low-cost airline in Europe, with a traffic growth of 9% from 2018 to 2019 and considering it transports the highest number of passengers from any EU airline, the ranking is not bad. Easy Jet has also lowered their carbon emissions per pax/km from 78.46 gr in 2018, to 77.07 gr. in 2019 (EasyJet, 2020).

The customer impact on airlines' environmental protection programs
In the last years, it seems that the industry has made a coalition for sustainable aviation. EasyJet experiences a 7% increase in the number of passengers aware of their carbon offsetting program and 11% increase in satisfaction (EasyJet, 2020). They point out that this is an important criterion for passengers to elect the services of the same airline in the future. If the airline suggests that environmental protection becomes a responsibility also for the passengers and they have the opportunity to offset their CO_2 emissions, this turns into a marketing approach that supports a particular view of a story.
It is very interesting to assess the impact such campaigns have on the customers, since they aim to place that particular airline closer to the passenger's heart. A study performed in 2012 by Swiss International Air Lines showed that environmental activities and responsibility carried by airlines seemed to be appealing to passengers (Wittmer and Wegelin, 2012), but the actions were not clearly visible or understood. This is also the case of Lufthansa, which although invested billions in airline sustainability, due to lack of marketing strategy, its actions were not so visible. This is no longer the case nowadays, an airline environmental protection program, but more so, the development of "green marketing", have improved significantly from 2012 to 2020.
Green marketing is considered an alteration to the airline traditional marketing mix (Mayer et al., 2014). Airlines trick or mislead their passengers in believing they are part of the change, since they can also support the sustainable future of aviation. Although they may not be environmental activists, passengers can get involved thinking that now they have an important role in aviation environmental protection. By trapping them in this mirage of saving the planet, airlines give their customers the false perception that they should only fly with the airline that is the leader in sustainability, because this is the only way passengers can be sure of their own implication. Ryanair points out that its passengers are smart since they chose this LCC to the detriment of other airlines, less environmentally efficient. Also, suggests that EU should support aviation and indicate to its citizens to drive less and switch to flying (Ryanair, 2019). But deceiving passengers in sustaining one airline's smart environmental policy is not easy. Some researchers argue that "Sustainable development means absolutely nothing to most people and never will" (Oepen, 2006), since it doesn't provide a clear definition, nor an immage of how it might be in the passenger's bennefit.
The passenger perception can draw a fine line between what is considered an environmental communication problem or a good green marketing. One cannot assess or even have access to information regarding the airline's economic interests behind its eforts to integrate air transportation policies into sustainable development, but the ecological dimension of airlines' programs can be of an interest for the passengers only if it becomes a personal concern or awakens in the passenger some emotions, (i.e. they start to feel better about themselves for protecting the environment).
With a probability of P=87.3%, passengers have the intention to fly with an environmentally friendly airline, and with a probability of P=94.3%, people are willing to spend more in order

to access the services of a sustainable airline (Hwang and Choi, 2017), that has a great sustainability commitment formulation.
While waiting for electric flying or air travel on hydrogen, other researchers indicate that people could "make themselves more sustainable" by flying less (Porcelijn, 2017). Nevertheless, one cannot undermine the importance of air transport in tourism and business and its economical and social impact. More so, due to present trends, IATA estimates that in the context of the following 17 years, air travel will reach 8.2 billion passengers (IATA, 2018). Thus, the only plausible option and enabler to achieving a balance in case of no practical alternative transport mode, is to fly with sustainable airlines that develop genuine offset programs and use biofuels or eliminates plastic use. To a small extent, passengers can make their own options so that their contribution to pollution has the lowest environmental impact. (FlyGreen, 2020) gives tips on flying greener: avoid indirect flights or choose to fly at economy class; since business class seats occupy more space than the ones at economy.
The targets set internally and the performance alignment within the industry, put great pressure on airlines. These green solutions can be achieved only with a cost. Delta Air Lines commits to invest $1billion in emission reduction based innovations. Notwithstanding, their actions towards economy-wide emission reduction are not balanced with the huge number of flights operated. In this context, the airline is required to show that it is in fact contributing to air transportation sustainable development, not just "greenwashing" (GlobalData, 2020). In this case, the airline's sustainability commitment formulation and implementation is considered an unsubstantiated initiative, the substrate being the intention to persuade the customers to form a much better image of the airline through their smart environmental policies. Without a robust implementation and a consistent assessment of the impact of different policies, models and assumptions, the green marketing strategy although it can be sustained by good communication plans and commitment formulation, is in vain.

Conclusions

International bodies have elaborated more exigent legislation for sustainable development of air transport industry. These regulations are completed by national regulations, sometimes more exigent than the first ones. Also, all categories of airlines business models develop strategic programs for sustainable development and all airlines are preoccupied for their "green brand" and incorporate green actions in their marketing mix.
After the examination of documentary information, results regarding airlines marketing strategies, their choice for a communication channel that has the best capacity to transmit a green vision to the passengers were quantified by the instrumentality of the expected or achieved success of sustainability mission statement.
Sometimes, the advertising of airlines for their preoccupations for reducing the footprint on environment is more ambitious than the real actions. Airlines' communications are becoming well developed in order to transmit more environmental consciousness, a green image of the airline. The sustainable development has impact also on the financial results of airlines, their actions for environmental protection lead to the decrease of operational costs, (less fuel burned means less emissions, for example). One of the most important ways to reduce the CO_2 footprint used by airlines is to invest in a new fleet beneficiary of the application of new engines, aerodynamic technologies and the use of biofuel.
LC pay more attention on environment protection solutions than LCC, and the European Commission programs are also developing an eco–friendly air transport.

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