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**Title:** Competitive Advantage through Environmental Responsibility? A Case Study of Finnair

**Year:** 2013

**Version:**

**Please cite the original version:**

Baumeister, S. (2013). Competitive Advantage through Environmental Responsibility? A Case Study of Finnair. In 17th Air Transport Research Society World Conference in Bergamo/Italy on 26.-29. June 2013. Air Transport Research Society.

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## COMPETITIVE ADVANTAGE THROUGH ENVIRONMENTAL RESPONSIBILITY? A CASE STUDY OF FINNAIR

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### ABSTRACT

In recent years there has been increasing interest in the environmental impacts of aviation, and some airlines have begun to address this issue more seriously. At the same time competition in the aviation industry has become much tougher. This study focuses on the question whether showing pro-active environmental behaviour could work as a differentiation strategy for airlines which are acting more responsibly, thus helping them to improve their competitiveness. For this purpose one airline showing strong pro-environmental behaviour in recent years was chosen as an example: Finland's flag carrier, Finnair. This paper presents the results of a questionnaire conducted among 148 Finnair customers on their opinions and attitudes towards environmental aspects of flying, such as a modern and fuel-efficient fleet, direct flights, carbon offset, and emissions calculators. The results showed that indeed there are air passengers who consider the environment when booking a flight, although this was not the majority. The study also found that the participants saw additional value in a modern fleet and direct flights, but not all of them were ready to pay any extra for that.

**KEYWORDS:** Competitive Advantage; Environmental Responsibility; Environmental Concerns of Flying; Finnair.

**CLASSIFICATION:** Environmental Issues in Air Transportation Industry; Airline Strategy, Management and Operations; Marketing in Air Transport.

### 1. INTRODUCTION

Air transport has become an essential part of our everyday life as it brings people to business, products to their markets, tourists to their holiday destinations and it unites families and friends all over the planet. While air transportation made the global village a reality it has, like the entire transportation sector, also a strong impact on our environment. According to Green (2003) the three main impacts of aviation on the environment are noise, air pollution around airports and influences on climate change. Hereby the contribution to climate change is seen as the impact with the greatest significance.

Even if the aviation counts currently for only 3 per cent of the man-made contribution to climate change (IATA 2011a) this industry is growing at a very fast rate. In the past the aviation industry saw a growth of about 4.4 per cent per annum (ICAO 2011a) and for the future an even stronger growth is predicted (Button 2007, Gössling & Peeters 2007). This growth also had an impact on the emissions released by aircrafts as between 1991 and 2003 the aviation's carbon dioxide emissions grew by 87 per cent (Rothengatter 2010). At the same time also the competition in the aviation industry has increased tremendously, due to liberalization and the opening of markets, which resulted in falling airfares bringing huge changes especially to the established airlines, mainly state carriers (Baumeister 2010). The interest in environmental impacts of the aviation industry has increased in recent years and in response several airlines have started to address this issue more seriously. At the same time

these airlines have also tried to use their pro-environmental approach to build up a positive corporate image (Mayer, Ryley & Gillingwater 2012). As Liou and Chuang (2009) found in their study, when evaluating the importance of corporate image in the aviation industry, corporate image can be a strong tool for stimulating purchases and in order to differentiate an airline from its competitors. So far, a lot of research has been done on how businesses could use their environmental responsibility as a differentiation factor in order to gain competitive advantage (e.g. López-Gamero, Molina-Azorin & Claver-Cortés 2009, Simpson, Taylor & Barker 2004) but not any single study has been focusing on the aviation industry. However one research paper could be found that answered at least the question what motivates airlines to act environmentally responsible. Lynes and Dredge (2006) found in their case study of Scandinavian Airlines that one motivational factor for an airline to act environmentally responsible is competitive advantage. This paper aims to bring together the two subjects of environmental responsibility and competitive advantage within the aviation industry, which so far has received little attention.

The basic aim of this research is to find out whether showing pro-active environmental behavior could work as a differentiation strategy for airlines, which are acting more responsibly, helping them to improve their competitiveness. For this purpose one airline showing strong pro-environmental behavior in the recent years was chosen as a case: Finland's flag carrier Finnair. The basic research question of this study was: What are Finnair's customer's attitudes towards environmental aspects of flying? For this purpose six environmental aspects were chosen which are unique for Finnair and the participants were asked about their attitudes towards these aspects, with the help of an online questionnaire. These six environmental aspects included a modern and fuel efficient fleet, shorter and direct routes, environmental concerns of flying, Finnair's new emissions calculator, their opinions about carbon offset and Finnair's environmental performance in general. Based on the answers provided by Finnair's customers a theoretical framework was used to detect in which ways Finnair could gain competitive advantage throughout its environmental responsibility.

## 2. ENVIRONMENTAL COMPETITIVE ADVANTAGE

According to Porter (1985) the basic of above-average performance of a company in the long run is sustainable competitive advantage. Competitive advantage can be defined as the value a company creates for its customers that exceeds the company's costs of producing it. Therefore to achieve more value and competitive advantage a company should offer a product that either has the same advantages than the competitor's products but with a lower price or a product that offers more advantages which justifies a higher sales price. This brings us to the two different types of competitive advantage which are cost leadership and differentiation.

Cost leadership means that a company sets the goal to become the low-cost producer in a certain industry. A well designed cost leadership strategy can work as a defence mechanism towards the main competitive forces in a certain industry because a low cost company is able to achieve higher returns than its competitors and can therefore stay much longer profitable. Differentiation means that a company intends to offer something unique for its customers that entitles them to ask for a premium price for their products. Hereby the uniqueness should be based on some attributes that a company finds valued by the customers. The company should then try to make these attributes superior and different from its competitors. The attributes can be basically anything that is part of the company's product such as the product itself, the way how it is delivered, the marketing approach as well as a broad range of other factors which makes the product different from the competitors' products (Porter 1985).

When looking at the aviation industry many examples can be found where these two strategies were applied. The business model of low cost carriers is a good example of a successful cost leadership strategy. Other airlines instead have chosen the differentiation

strategy by offering their customers unique products like for example Finnair (2011c) which intends to become the leading airline in terms of environmental responsibility. This could give Finnair a unique position within the industry, bringing Finnair competitive advantage through differentiation.

According to Schaltegger, Burritt and Peterson (2003) environmental product differentiation is based on the idea that a company creates a product that provides either greater environmental benefits or has a smaller environmental impact. In addition to that or also alternatively the creation of the product or service might be carried out in a way that is less environmental harmful than the production processes of the company's competitors (Reinhardt 1998). In the case of Finnair operating a modern and fuel efficient fleet that produces less emissions during the flight could be such an example.

The changes in the product design or the production processes will in many cases increase the production costs, in return however the company can then also ask for a higher product price as the product or service contains additional value (Russo 2010). In our example operating a modern fleet requires the constant purchase or leasing of up to date aircraft which is very costly. Finnair has therefore to ask for a premium price to cover these costs.

According to Porter (1985) differentiation has its bases on specific activities a company performs and the way those affect the customer. Basically any activity a company performs can be a potential source of uniqueness. Based on Finnair's environmental publications (Finnair 2011a; Finnair 2010a) but also through a interview with Finnair's Vice President Sustainable Development Kati Ihamäki (2010) six sources of environmental differentiation could have been detected among Finnair's environmental performances which are unique, those are:

1. Modern fleet: Finnair flies one of the youngest fleet in the world which is renewed constantly. Finnair was the first airline to order next generation aircrafts such as the Airbus A350XWB and the advanced A321ER. Based on the fleet renewal Finnair plans to reduce its emissions by 41 per cent until 2017, based on 1999 figures (Airbus 2011; Finnair 2011a; Finnair 2010b).
2. Shorter routes: Finnair offers the shortest routes between Europe and Asia via Helsinki which not only saves time but also ensures flying constantly into the right direction. Helsinki Vantaa offers enough runway capacity assuring smooth operations (Finavia 2008; Finnair 2011a).
3. Environmental concerns of flying: Finnair already reports since many years about its environmental impacts and provides a lot of information to their customers about the impacts of flying. Hereby Finnair is not only telling the customer to act more environmental friendly but shows also a lot of own commitment (Finnair 2011a; Finnair 2011b).
4. Carbon offset: Finnair clearly distances itself from carbon offset because at Finnair people think that offering carbon offset only shifts the responsibility away from the airline to the customer. Finnair wants to be a responsible airline and compensate the own emissions by themselves (Ihamäki 2010).
5. Emissions calculator: Finnair introduced in autumn 2010 the worldwide first emissions calculator that is based on actual passenger, freight and fuel data (Finnair 2011c).

6. Finnair's environmental performance: According to the Carbon Disclosure Project's 2010's Nordic Report Finnair's environmental performance is among the elite airlines on a global scale (Carbon Disclosure Project 2011). Finnair is listed on the NASDAQ OMX Sustainability Index since 2011 (NASDAQ OMX 2011).

Porter (1985) stated that differentiation only works as a competitive advantage factor when it creates a value to the customer. Beside that, Porter (1985) also found that customers only pay a premium price for a product or service if they really perceive the value. Whether Finnair's customers really see a value in these six sources of environmental differentiation and also perceive this value will now be investigated further in this study.

### 3. CASE STUDY OF FINNAIR

Finnair is the largest Finnish airline and the state's flag carrier. Established in 1923 Finnair's operations focus mostly on transporting passengers between Europe and Asia, via its hub in Helsinki. Beside that Finnair's operations also covers leisure traffic, technical and ground handling operations, catering, travel agencies as well as travel information and reservation services. Finnair has approximately 8,000 employees and operates a fleet of around 60 airplanes (Finnair 2011d).

#### *3.1 Modern Fleet*

Operating a modern fleet is having a huge impact on cutting down carbon dioxide emissions. Increasing the efficiency leads to a reduction of fuel consumption and to fewer emissions which results in a lower impact on the environment (Egelhofer, Marizy & Cros 2007). Hereby the achievements in efficiency have been tremendous in the past decades. When comparing the first commercial jet airliner the de Havilland Comet designed in the mid-1950s with the most advanced jet airliner currently available on the market, engine fuel consumption has dropped by more than 40 per cent and when translated into a fuel burn per seat even by 70 per cent (European Commission 2011).

According to Finnair their most important environmental act is to renew their fleet constantly. Finnair flies its scheduled routes with one of the youngest fleets in the world (Finnair 2011a). Due to the 31st of December 2010 Finnair's fleet had an average age of 6.7 years (Finnair 2011b), compared to that the average world fleet is about 11 years old (IATA 2011b). Finnair's current fleet consists of modern Airbus A330-300 and A340-300 wide-body aircrafts for long-haul flights to Asia and Northern America as well as of its European and domestic fleet with different members of the Airbus A320 family (A319, A320 and A321) and Embraer 170 and 190 jets (Finnair 2011a). On its leisure routes Finnair is still operating older Boeing aircraft type 757-200, those planes will leave the fleet in the near future and will be replaced by modern Airbus aircraft. The extensive fleet renewal by replacing all McDonnell Douglas DC-9, MD-80 and MD-11 aircraft between 1999 and 2009 has resulted in a reduction of emissions by 22 per cent. On the long term Finnair plans to reduce its emissions by a total of 41 per cent by 2017 based on 1999's emissions (Finnair 2011a).

Also in the future Finnair will renew its fleet constantly. Finnair was the first airline which placed a firm order for the new Airbus A350 XWB which will become available around 2014 (Airbus 2011). Finnair placed 11 orders for this new and more fuel efficient aircraft which will consume less than three liters per passenger and 100 kilometer (Finnair 2011b). Also the renewal of its continental fleet continues as Finnair was as well the first airline to order five Airbus A321ER, a more fuel efficient version of the current A321 model available during 2013. A special feature of the A321ER is the new wing-tip sharklet which will reduce fuel consumption by up to five per cent (Finnair 2010b). Beside that Finnair's

entire current fleet is equipped with winglets or sharklets, even the older Boeing 757-200 planes got retrofitted with those fuel saving devices (Finnair 2011a).

### *3.2 Shorter Routes*

According to Hileman, Katz, Mantilla and Fleming (2008) the most efficient way to get from a point A to point B is to use the shortest distance also known as the great-circle distance. Any diversion from the great-circle distance is decreasing the efficiency and leads in case of air traffic to additional fuel consumption and further emissions. The diversion from the great-circle distance can have several reasons; among those are weather conditions or air space restrictions. A further reason for a diversion is the routing of a flight connection especially when it is not a direct flight but has stopovers between origin and final destination (Hansen, Smirti & Zou 2008). Depending on where the stopover takes place this can lead to a larger detour increasing the distance between origin and final destination significantly. When we for example compare two flight options from Helsinki to New York JFK, the direct flight (6,952 km) would require a flight time of 8:40 hours while a connecting flight via Paris CDG would require 11:15 hours of flying time and increase the distance to 8,140 km (Finavia 2011, Finnair 2011c).

According to Finnair their own hub at Helsinki Vantaa offers due to its geographical location in many cases the shortest routes between Europe and Asia. Flying via Helsinki means constantly flying into the right direction, using the shorter northern route (Finnair 2011a). But also when flying from Asia to North America, via Helsinki displays in many cases the shortest route and saves emissions at the same time. A flight from Delhi to New York via Helsinki (11,821 km) emits approximately 294 tonnes of carbon dioxide while a flight via Dubai (13,229 km) releases over 30 tonnes more carbon dioxide, all together 326 tonnes (Morrell 2010).

A further aspect enlarging the duration of a flight is the limited runway capacity paired with high traffic volume at major airports making it quite often necessary for airplanes to fly holding patterns before they can finally approach the runway for landing (Reynolds, Gillingwater, Caves & Budd 2009). While other European airports such as London Heathrow, Paris Charles de Gaulle, Amsterdam Schiphol or Frankfurt Main are already operating at their capacity limits, making sometimes longer holdings necessary, Helsinki Vantaa airport has with its three runways more than enough capacity (Via Helsinki 2011; Reynolds et al. 2009). Flying via Finnair's hub at Helsinki not only offers the shortest routes between Europe and Asia but reduces also emissions as airplanes are not unnecessarily hold in the air before they can finally land on a highly crowded runway.

Beside that Helsinki Vantaa offers also the perfect conditions for continuous descent approaches (Finavia 2008). According to Finnair (2011b) about 60 to 80 per cent of all landings at Helsinki Vantaa Airport are carried out as continuous descent approach saving approximately five million kilograms of fuel every year. Continuous descent approaches can reduce flight times by 45 seconds resulting in a fuel save of about 40 litres and 150 kilograms of carbon dioxide per flight (Musquère 2008). In comparison to Helsinki Vantaa also other airports started to implement the continuous descent approach. Musquère (2008) found that launching this new approach method at Paris region was considered as very difficult due to the high air traffic in that region, especially maintaining the safety standards in form of the vertical separation of aircrafts by 300 meter. The full potential of the continuous descent approach might only be used at less crowded airports such as Helsinki Vantaa.

### *3.3 Environmental Concerns of Flying*

When it comes to air traveller's awareness of the impact of flying on the environment several studies found that the awareness is in general quite low (Brouwer, Brander & Van Beukering 2008; Hares, Dickinson & Wilkes 2010; Miller, Rathouse, Scarles, Holmes & Tribe 2010). According to Hares, Dickinson and Wilkes (2010) air travellers have basic knowledge about climate change nevertheless they lack in a deeper understanding. Many travellers can however identify air traffic as a major cause of climate change but when it comes to planning a trip the environmental impacts are most likely not taken into consideration. Hares, Dickinson and Wilkes (2010) found in their study that in the travellers mind quite often no association is made between flying and climate change when booking a flight or it is basically displaced. According to Bonini and Oppenheim (2008) the low awareness of the impacts of flying onto the environment can be overcome by better educating the traveller. Bonini and Oppenheim (2008) found that the traveller in general wants to act eco-friendly but is often confused or uncertain about how to behave. Beside that Bonini and Oppenheim (2008) also found that there is a certain distrust existing as consumer suspect "greenwashing" behind many so called "green" products or services. It is therefore very important to bring the airlines own environmental attitude into a broader perspective such as climate change. For example it should be clearly stated how much carbon dioxide emissions can be reduced by operating a modern fleet. To overcome the suspicion of "greenwashing" the airlines have to be honest and tell the truth about the environmental impacts of flying. At the same time also the airline should act green, just telling the travellers to do so while the airline is not really putting any effort doesn't make the message very trustworthy (Bonini & Oppenheim 2008).

Finnair (2010a) has been giving information to corporate customers for many years and has recently also started to provide private customers with information for example by integrating its emissions calculator on the Finnair webpage. Now everybody can compare Finnair's flights via Helsinki with those ones of Finnair's competitors via Amsterdam with KLM, via Copenhagen with SAS, via Frankfurt with Lufthansa and via Paris with Air France. Beside that Finnair (2010a) has also been participating in the Carbon Disclosure Project for several years but so far not all airlines have done so, which means a standardised way of reporting hasn't still arisen. Finnair (2010a) thinks that in future the comparability of emissions in addition to the air fare will become more important and would like to include information about emissions to all booking systems. According to Ihämäki (2010) the traveller could then see at once what kind of eco-friendlier choice it is to fly Finnair with the shortest routes between Europe and Asia operating the most modern fleet in the industry. Only with the right information at hand, the traveller can make the right decision.

### *3.4 Carbon Offset*

Following the polluter pays principle individuals, companies or governments can purchase offsets on the carbon market to mitigate their own carbon dioxide emissions (Brouwer, Brander & Van Beukering 2008). Surveys conducted by van Birgelen, Semeijn and Behrens (2010) as well as Brouwer, Brander and Van Beukering (2008) showed that there is a high willingness among air passengers to pay for carbon offset, only around 15 per cent of the respondents did not show any willingness to pay for carbon offset. Brouwer, Brander and Van Beukering (2008) found that the motivation among air travelers to pay for carbon offset comes not so much from existence values such as give to good causes or charity but that the primarily motive is to take responsibility by paying for the contribution to climate change. The motivation could more be explained as a moral obligation paired with concerns about our environment and future generations.

Gössling, Broderick, Upham, Ceron, Dubois, Peeters and Strasdas (2007) found that there are many providers offering carbon offset for air travelling on a voluntary base. These providers are using different approaches how to calculate the emissions produced by a certain flight. Some are just using simplified factors while others are more accurately also taking the aircraft type, its age and load factor into account. This of course results also in differences when it comes to the price that has to be paid for the carbon offset. In certain cases the price might differ so much that some provider is asking for a 15 times higher price for the exact same flight than another provider does. Beside that the question remains whether an emission is truly offset or not as voluntary offsetting schemes are so far not subject to any regulation (Gössling et al. 2007).

But even though carbon offset works the question remains can it really be seen as a sustainable solution for dealing with aviation's emissions in the future? The main problem here is that carbon offset organisations are offering neutralisation for emissions released by air travelling by compensation in other sectors e.g. afforestation. This will not motivate the aviation industry to reduce their own emissions because the problem can easily be shifted somewhere else. Though emissions from flying can be offset by e.g. planting trees or building wind farms this approach is somehow limited, especially when aviation's emission are still growing in the future (Gössling et al. 2007).

According to Finnair's Vice President Sustainable Development Kati Ihamäki (2010) Finnair does not offer carbon offset at all because she thinks that it should be the airlines responsibility for compensating the own emissions. By operating a modern and fuel efficient fleet any airline can take responsibility but this requires also big investments. Those investments result quite often in higher ticket prices which means that a less polluting flight often costs a little bit more. The reality shows that people often choose to fly with a cheaper airline not having the standards e.g. Finnair is offering and then they pay a couple of euros for carbon offset and think they acted in a very sustainable way. This approach basically shifts the responsibility from the airline to the air passenger. Ihamäki therefore favours a global emission trading system which she thinks would offer the greatest possibilities to force airlines acting responsible because otherwise they will have to pay for their emissions.

### *3.5 Emissions Calculator*

An emissions calculator is not only a useful tool to calculate the emissions of a particular flight but can also be used to compare different flight options or airlines based on their emissions. As already mentioned earlier in the section about carbon offset, there are many different approaches used how to calculate carbon emissions. Miyoshi and Mason (2009) found that different emissions calculators are using different methodologies. Many are assuming that all airlines operating on the same route are using the same aircraft type. It is needless to mention that a Mc Donnell Douglas MD-80 aircraft won't be as fuel efficient as an Airbus A320 family airplane. Beside that many emissions calculators are using unrealistically high load factors of up to 100 per cent or base their calculations on very high efficient fuel consumption factors. The following example presented in Table 1 illustrates how much the results can differ when comparing three different emissions calculators with each other. For a better comparability we choose in this example the route Helsinki to Stuttgart which is non-stop only operated by Finnair with a single aircraft type the modern Embraer 170 jet.



**Table 1**

Comparison of Different Emissions Calculators for the Route Helsinki-Stuttgart

Emissions Calculator	Distance	CO <sub>2</sub> Emissions
Finnair's Emissions Calculator	1,737 km	365 kg / passenger
SAS's Emissions Calculator	1,634 km	219 kg / passenger
ICAO's Emissions Calculator	1,754 km	170 kg / passenger

Source: Finnair (2011c), ICAO (2011b), SAS (2011).

Although all three calculators have based their calculations on the same aircraft type and also the distances assumed are not differing that much the results are varying tremendously. In this comparison the results from Finnair's emissions calculator can be seen as the most realistic ones. Compared to any other emissions calculator used in aviation Finnair's emissions calculator is the first one worldwide based on actual emissions figures. This calculator is using actual cargo, passenger and fuel consumption figures and not averages or assumptions like previous emissions calculators. The data used for calculation is beside that also updated on a quarterly basis (Finnair 2011c).

### *3.6 Finnair's environmental performance*

Finnair's goal is it to become the leading airline in the field of environmental responsibility. Finnair strongly supports IATA's zero-emissions aviation targets (IATA 2009) and considers itself as a pioneer in the evaluation, reporting and reduction of environmental impacts. Finnair's environmental work dates back to the early beginnings in the late 1980s, Finnair has been reporting regularly on its environmental impacts since 1997 (Finnair 2011b). Finnair sees clearly the responsibility for the emissions generated by flying at the airlines side and is therefore a strong advocate for a global emission trading system and enhanced emission reduction targets (Finnair 2011a). On the Carbon Disclosure Project's 2010's Nordic Report which is measuring environmental effects, Finnair achieved the highest score among all Nordic airlines with 61 points, in comparison to that Scandinavian Airlines only attained 25 points (Carbon Disclosure Project 2011). According to Kati Ihamäki (Finnair 2011a) this result places Finnair among the elite airlines also on a global scale as all the best performing airlines achieved more than 60 points. Beside that since 2011 Finnair is also listed at the NASDAQ OMX Sustainability Index among the top 40 Finnish companies (NASDAQ OMX 2011).

As shown above Finnair is investing a lot of money into its fleet renewal, Finnair offers the shortest routes between Europe and Asia via Helsinki, Finnair provides a lot of information concerning the environment to its customers and has established the first emissions calculator based on actual passenger, freight and fuel data. Beside that Finnair is also putting a lot of effort into recycling waste, saving energy and optimizing its processes to keep its impacts onto the environment as low as possible (Finnair 2010a). Being an environmental responsible airline is a voluntary choice any airline can do.

## 4. METHODOLOGY

This research is based on a quantitative survey in which 148 Finnair customers took part. The questionnaire was accessible online through Finnair's webpage for a period of two months during spring 2011. Due to their privacy policy Finnair was not able to give access to their customer database, it was therefore not possible to contact their customers directly. Instead a link was placed on Finnair's international private customer website which was basically accessible for all Finnair customers. The questionnaire was conducted with the help of the web-based interview programme. The questions were developed in close cooperation

with Finnair. The participants remained anonymously due to the reason that also questions concerning ticket prices were asked. This was done to ensure that the answers did not get biased. After running a pilot test with 10 participants in which the functionalities of the questionnaire was tested the link on the Finnair webpage became accessible on March 11<sup>th</sup> 2011 and remained there until May 17<sup>th</sup>.

The link was activated over 500 times during the two month period. Altogether 148 participants completed the questionnaire successfully and answered all the questions. For statistical analysis the 148 participants were asked how often they usually fly with Finnair. The majority of 31 per cent stated once a year, 29 per cent said 2-3 times per year and 9 per cent declared that they fly with Finnair every month. Beside that also 30 per cent stated that they haven't flown with Finnair so far. Although those 45 participants never flew with Finnair their answers were still analysed as they contained very useful information. For taking part in the questionnaire they had to visit Finnair's international webpage which shows that they have a certain interest in the airline and can therefore be considered at least as potential customers. From the 148 participants 52 were female, that are 35 per cent and 96 male which are 65 per cent. Beside that members from all age groups took part in the survey. The biggest group were the 26 to 39 years old with 53 per cent, followed by the group under 25 with 21 per cent. From the age group of 40 to 59 years old 20 per cent took part, the group over 60 consisted of 8 participants which equals to 5 per cent. The participants were also asked if they are participating in Finnair's customer loyalty programme the Finnair Plus Programme and what their current status is. Hereby 43 per cent of the participants are Finnair Plus members from which 73 per cent are on the Basic level, 13 per cent on the Silver level, 6 per cent reached the Gold level and 5 per cent are members of the highest tier Platinum. Beside that 3 per cent stated they are Finnair Junior Plus members, Finnair's loyalty programme for travelers from 2 to 17 years.

For deeper statistical analysis SPSS (Statistical Package for the Social Sciences) was used, especially for statistical significance testing and in particular to run the Pearson's chi-square test. Beside significance testing, SPSS was also used to calculate the Mean and Standard Deviation. As for the Likert scale alternatives it is important for the reader to notice that number 1 means fully agree with the statement, number 2 the participant agree, number 3 the participant don't know an answer, whereas number 4 means the participant do not agree and number 5 that the participant fully disagree with the statement.

## 5. RESULTS

### *5.1 Modern fleet*

As stated earlier Finnair's most important environmental act is to fly an up to date fleet which is renewed constantly. To find out if their customers really see value in the fact that Finnair is operating one of the most modern fleet in the industry they were asked if they agree with the statement whether flying a modern fleet is better for the environment or not. From the 148 participants who answered this questionnaire more than half of them, 51 per cent agreed fully with this statement. Another 38 per cent of the respondents agreed and only 17 participants which display the remaining 11 per cent didn't have an answer to this question. The Mean was 1,61 and the Standard Deviation was ,686. The results showed that the participants have really perceived the fact that flying a modern fleet is better for the environment. None of the participants disagreed with the statement but there were also some participants who did not have an answer to this question.

### *5.2 Shorter routes*

Finnair is offering the shortest routes from Europe via Helsinki to Asia as well as the shortest routes from Finland to Europe, Asia and North America. When participants were asked whether they prefer shorter routes and more direct flights the results showed that the total flight time as well as non-stop flight connections to the final destination did not seem to be as important as the ticket price. While 66 per cent of the respondents considered the ticket price as a very important factor when booking a flight, only 36 per cent considered the total flight time as very important and only 27 per cent saw non-stop flights to the final destination as a very important factor. Still 36 per cent of the respondents described non-stop flights as an important factor but the remaining 37 per cent of the participants considered non-stop flights as less important or not important at all when making a booking decision. When asking the question whether those customers would accept stopovers on their way to their final destination, if the flight would therefore cost less, the majority agreed or fully agreed, altogether 73 per cent. Only a minority of 5 per cent fully disagreed with this statement. The Mean of this answer was 2,20 and the Standard Deviation was 1,245. This shows that the majority of the participants are ready to use connecting flights which require longer detours or the stopover at a intermediate airports to save money instead of flying on a more shorter route directly to and from Helsinki or via Helsinki to any destination in Asia. When participants however were asked if they take any environmental aspects into consideration when booking a flight, almost half of the participants answered that they choose direct flights and try to avoid stopovers.

This shows clearly that some of the participants are aware of the fact that flying shorter routes and avoiding unnecessary starts and landings is better for the environment. Nevertheless when it comes to the question if they would be ready to pay a higher price for shorter and more direct flights their willingness was not very high. The participants were ready to use connecting flights and accept stopovers if it saved them money. They see value in direct flights and shorter routes but they are not ready to pay more for this kind of environmental supplement.

### *5.3 Environmental concerns of flying*

Studies showed that travellers in general want to act more environmentally friendly. These aspect needs in that regard to be considered as early as someone plans and books a journey as such. Therefore the participants were asked what kind of aspects they take into consideration when making a booking decision. As already mentioned most of the participants chose the ticket price as the most important criteria. Other criteria such as the total flight time, non-stop flights to the final destination, the suitable departure and arrival time were important for some travellers as well. Further aspects such as for example Finnair's new identity as a design airline however were not considered as having any significant impact on the booking decision by any of the participants. Therefore the answers to the following question whether the participants take also any kind of environmental aspects into consideration when booking a flight or not were as expected. Only 30 per cent of the participants stated that they consider the environment, the remaining 70 per cent don't consider this aspect at all.

Those participants who chose yes were also asked to specify what kind of aspects they are taking into consideration. Hereby the two aspects of modern and fuel efficient fleet as well as the preference of non-stop flights were mentioned the most. Many participants also stated that they try to avoid flying either by searching for an alternative transportation mode such as going by train or even not making the trip at all. Beside that several participants also mentioned that they are offsetting their carbon emissions. Some also mentioned noise as a criterion which can be dedicated to the aspect of modern fleet. A few participants mentioned

aspects related to the airline's environmental practices regarding waste handling, the reduced use of paper e.g. by offering mobile boarding passes and the use of metal cutlery and reusable dinnerware. One participant also stated that he always tries to fly with an airline that shows a strong environmental sustainability initiative.

When the participants in a second question were concretely asked if they would be ready to pay a premium price for a flight that is producing fewer emissions no clear trend towards the willingness or unwillingness could be detected. The amount of participants choosing either the options "agree", "don't know" or "disagree" was exactly equal with 28 per cent each. Only when it came to "fully agree" there was only 6 per cent, while 11 per cent chose "fully disagree".

Finally the participants were asked whether they would be interested in donating some of their bonus miles, in case of Finnair called Plus-Points, to projects aiming to recover the nature such as to the Baltic Sea Action Group or the Finnish Association for Nature Conservation. The results showed that 40 per cent were interested in donating their Finnair Plus-Points, while 30 per cent did not want to give their bonus miles away. The Mean was 2,93 and the Standard Deviation was 1,153. When having a closer look at the connection between willingness to donate and the Finnair Plus tier status, the figures showed that the higher tiers such as Gold and Platinum members were compared to the Basic and Silver members less interested in donating their points. The most disagreement could be found among the Platinum members. Also Junior Plus members didn't show much interest in donating their bonus miles.

#### *5.4 Carbon offset*

Finnair is clearly distancing itself from carbon offset because Finnair thinks offering carbon offset shifts the responsibility away from the airline to the customer. Nevertheless carbon offset is nowadays offered by many airlines to their customers as an additional service. One aim of this research was therefore to find out how participants are thinking about carbon offset and the question are they ready to pay for offset their carbon emissions?

Almost half of the respondents, 47 per cent, agreed with the statement that carbon offset has a positive effect on the environment, 28 per cent didn't know an answer and the remaining 25 per cent disagreed. The Mean was 2,40, the Standard Deviation for this question was ,966. When it came to the question if the participants had ever paid for carbon offset only 20 per cent stated they did while 80 per cent never paid before. The Mean here was 2,74 and the Standard Deviation was 1,127. It was interesting to see that so many participants considered carbon offset having a positive effect on the environment but only so few had ever paid for carbon offset. When asking the question whether those participants who have ever paid for carbon offset also believe that it has a positive effect for the environment the Pearson's chi-square test delivered actually an even more interesting result:  $\chi^2 = 6.666$ ,  $DF = 4$ ,  $p < .155$ . This basically concludes that the participant's answers whether they think carbon offset is better for the environment was not depending on the fact either they ever paid for carbon offset or not.

When the participants in a third question were asked if they would like Finnair to offer carbon offset 58 per cent agreed that Finnair should offer this kind of service, 29 per cent didn't know and only 12 per cent disagreed. The Mean was 2,47 and the Standard Deviation was ,993. The results showed that among the participants who want Finnair to offer carbon offset are many who already paid for offsetting their emissions but at the same time there are also plenty of participants who want Finnair to offer carbon offset, even if they never paid for it before. The Pearson's chi-square test found no significant relationship between the participant's opinion regarding the two questions whether they are asking Finnair to offer carbon offset and the question whether the customer ever paid for carbon offset. The results

read:  $\chi^2 = 3.340$ ,  $DF = 4$ ,  $p < .503$ . With other words the fact either a customer had paid for carbon offset so far or not did not affect the customers answer to the question whether he or she wanted Finnair to offer carbon offset. It seems more that the participants think that carbon offset is better for the environment and should be offered by airlines, but this not necessarily means that they also going to use and pay for it.

### *5.5 Emissions calculator*

Finnair has launched the worldwide first emissions calculator that is based on actual emissions in autumn 2010. After the emissions calculator had been only available for about six month, Finnair's customers were asked if they had heard about the calculator, if they had use it and whether they could imagine that it will help them in their decision making when booking a trip in the future.

Altogether 36 out of 148 participants, which represent 24 per cent, stated that they had already heard about Finnair's emissions calculator. Out of these 36 participants 13 had tested the emissions calculator but only 2 participants thought that the results gained would have had any kind of impact on their future travel plans. Those remaining 2 customers were asked in which way they think this results could have had an impact on their future travelling plans and only one respondent answered that it actually made him more aware of the fact how much pollutions we are actually creating when flying. Among the participants who had heard about the emissions calculator the group of the 26 to 39 years old was with 30 per cent the strongest. Followed by the group of under 25 years old were 26 per cent had heard about the emissions calculator before. From the age group of over 40 years old only a few had noticed the emissions calculator and in the group of the over sixties non of the participants had ever come across it. When it comes finally to the question who had tried the emissions calculator a clear trend can be seen that with growing age the interest in testing had been decreasing.

### *5.6 Finnair's environmental performance*

The Carbon Disclosure Project's 2010's Nordic Report attested Finnair regarding its environmental performance to be among the elite airlines on a global scale. Therefore the participants were asked if they think that Finnair has a leading role in Europe when it comes to environmental responsibility. The result of this question was interesting as the majority of 59 per cent didn't have an answer to this particular question. Among those participants who had an opinion 34 per cent said that they think Finnair has a leading role in Europe while only 7 per cent did not think that Finnair is an environmental responsible airline in this regard. The Mean was 2,66 and the Standard Deviation was ,779. This confirms that at least some participants have recognized Finnair's environmental work and that hardly anybody does think the opposite, considering Finnair as an airline which does not care about the environment at all.

When bringing the participants answers to this question in connection with their answers whether they take any kind of environmental aspects into consideration when booking a flight, the results showed a slight trend towards that those customers considering the environment are tending towards the opinion that Finnair does care about the environment. These results gave the impression that those customers who care about the environment when they have to make booking decisions for flights are to a certain extent considering Finnair flights as a responsible choice. Nevertheless the Person's chi-square test could not find a clear significant relationship between the participants opinion about Finnair's environmental performance and the question whether they consider the environment when booking a flight. The above stated hypotheses were not supported by the significance test as the results read:  $\chi^2 = 4.620$ ,  $DF = 4$ ,  $p < .329$ .

## 6. CONCLUSION

Within the aviation industry competition has become much tougher in the recent years and at the same time also the interest in the environmental impacts of aviation has increased. This study focused on the question whether showing pro-active environmental behavior could work as a differentiation strategy for an airline, helping it to improve its competitiveness. For this purpose one airline was chosen as an example which has shown strong pro-environmental behavior in the recent years, Finland's flag carrier Finnair. The basic research question for this study was to find out what are Finnair's customers' attitudes towards environmental aspects of aviation. Therefore six aspects of environmental differentiation were chosen that are unique for Finnair, which could help the company to gain competitive advantage. Altogether 148 participants were asked various questions regarding their attitudes to this aspects, what kind of value do they see in this aspects and how do they perceive these values.

As the results showed, the majority of the participants value the fact that Finnair is operating a modern fleet. The participants really perceived the fact that operating a modern and fuel efficient fleet is better for the environment. This environmental aspect can therefore definitely be seen as a competitive advantage factor for Finnair.

The results of the questionnaires showed that the participants see a certain value in shorter routes and direct flights and many participants were aware of the environmental impacts of connecting flights and unnecessary take-off and landing cycles. However the study found also that the participants are very price sensitive. Although they value shorter routes, their willingness to pay a premium for that was not very high. Offering the shortest routes between Europe and Asia as well as from Helsinki to many destinations in Europe, Asia and Northern America could be a competitive advantage factor for Finnair as the participants really perceived this as a value. The problem here is Finnair's airfare which is located more at the premium price segment.

The study found that only 30 per cent of the participants really consider environmental aspects when booking a flight. Even so this share was quite small the answers given by the participants showed that this minority had quite a good understanding of the environmental aspects of flying. They basically saw value in the six sources of Finnair's environmental product differentiation as they considered many of these aspects as positive for the environment. The amount of participants who showed a willingness to pay more for a less polluting flight was quite similar with 34 per cent, who basically stated that they are ready to pay more. Among those customers who consider environmental aspects of flying and who are willing to also pay some extra for that, Finnair definitely could gain competitive advantage based on the fact that they are offering exactly such flight options.

The results showed that almost half of the participants thought that carbon offset is good for the environment and an even larger amount preferred that Finnair would offer carbon offset to them. The participants obviously saw a value in carbon offset. Offering carbon offset could therefore lead to competitive advantage based on the theory presented. However as discussed earlier Finnair is following a different approach by trying to avoid carbon emissions right in the beginning instead of shifting the responsibility towards their customers by letting them cleaning up the emissions afterwards. Beside that the results also showed that only a minority of the participants have ever paid for carbon offset and that those ones were not necessarily the same participants who thought that carbon offset is better for the environment. This lead to the assumption that, in case Finnair would offer carbon offset, it could probably improve their image as an environmentally responsible airline but it would not necessarily mean that many customers would use the option for offsetting their carbon emissions. Nevertheless offering carbon offset would also not necessarily mean that Finnair has to change its entire environmental strategy, Finnair could offer carbon offset just as an additional service.

The study found that Finnair's new emissions calculator has not really attracted the interest of that many customers so far. Especially the answers from those participants who were among the very few active users showed that they did not really perceive the value of this calculator. Although being the first airline worldwide who has introduced an emissions calculator based on actual emission figures, this might not necessarily bring Finnair any competitive advantage as long as it does not attract the customer's interest.

The results showed that a majority of the participants did not have an answer when they were asked whether they think Finnair has a leading role in Europe when it comes to environmental performance. On the other side, those one's which could answer the question mostly tend to agree with this statement which showed that they have perceived Finnair's overall environmental performance. Even so it could not statistically been proved, a slight trend could be detected that those participants who stated that they consider the environment when booking a flight are also thinking that Finnair has a leading role in Europe when it comes to environmental responsibility. This lead to the conclusion that among those air travelers who consider the environment when booking a flight Finnair is seen as an environmentally responsible airline. According to the presented theory, among this customer segment, Finnair definitely could gain competitive advantage as these customers see an additional value in Finnair's environmental performance.

The above presented findings will provide Finnair with information about their customer's opinion regarding their environmental performance. The study unrevealed in which of those six source of Finnair's environmental product differentiation their customers see value and which of these six environmental sources could help Finnair to gain competitive advantage. Based on the information provided by this study Finnair could develop strategies how to more efficiently communicate their environmental work. Also for other airlines, which are aiming towards environmental product differentiation, this findings could provide them with valuable information about different factors which can help them to gain competitive advantage, based on the example of one of the leading airlines regarding environmental responsibility.

## 7. STUDY LIMITATIONS AND FURTHER RESEARCH

The limitations of this research can be seen in the fact that this study only focuses on one single airline and only on those six chosen environmental aspects related to Finnair. Nevertheless the participant's attitudes towards modern fleet, shorter routes, environmental concerns of flying, carbon offset and emissions calculator can in many cases also be generalized and applied to the environmental performance of the entire aviation industry. Another limitation is certainly the sampling. As only random sampling could have been applied there wasn't much of an opportunity to control who fell into the sample, which became quite obvious when looking at the demographics. While the distribution of the different age groups can be considered as quite fair the distribution of the gender is not very satisfying. Among the participants 65 per cent were male and only 35 per cent female.

This study addressed the question whether the participants were ready to pay more for a less polluting flight. At least some of the participants showed willingness to pay more for such a flight. Further research could therefore be done by asking air travelers how much more they would be ready to pay for a flight that has less impact on the environment. Beside that also the environmental responsibility of Finnair was discussed a lot. Further research could be done by asking air travelers how they perceive the environmental responsibility of different airlines and whether and how this effects their booking decision. Finally also the impact of emissions calculators could be studied further especially when assuming that they could be integrated into the booking process, providing the air traveler with figures about the environmental impact of the different flight options from which they might be able to choose.

## ACKNOWLEDGEMENT

The author would like to thank Finnair Oyj for providing valuable space on their website where the link was placed for the online questionnaire as well as Ms Kati Ihämäki and Ms Laura Kantanen for all their assistance and support in the production of this paper.

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