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Sustainability Analysis of the Airline Industry – Low Cost Carriers and Full Service Carriers

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Abstract

The aviation industry is perceived as being unsustainable in the long term due to foreseen continuous growth and the use of finite natural resources. To become more sustainable airlines need to address sustainability in their business model and business strategies. This research explores how the two airline carrier types, Ryanair, an LCC, and Scandinavian Airlines (SAS), an FSC, have addressed sustainability in their business models and business strategies, using a European case study approach. From the research conducted learning's were extracted for both FSC and LCC.

This research utilised a generic three-lense viewpoint being: strategy, operations and culture, together with a more specific viewpoint of environmental stewardship strategy, to review how Ryanair and SAS have addressed sustainability within the airline. Ryanair and SAS are both doing well in the strategic integration of sustainability due to their large investments in fleet renewal and advancements, which reduce fuel consumption and emissions, thereby contributing to sustainability. Ryanair is not succeeding, however, with regard to operational and cultural integration and environmental stewardship. Ryanair's low cost strategy focus is providing the lowest possible airfare for customers therefore sustainability is not a priority. Ryanair has poorly addressed sustainability in the following areas: leadership, communication, reporting, stakeholder pressure, embedding environmental consciousness, diffusion and translation of best practices and so forth. The research determined that SAS is the opposite of Ryanair in regard to operational and cultural integration and environmental stewardship. SAS is proving to be successful in addressing sustainability in their business model and business strategy. SAS's product differentiation strategy leans strongly towards sustainability, which has resulted in complete sustainability integration approach in all business functions within the airline. SAS is transparent and informative on their sustainability effort, which is highlighted through their strong communication, reporting, and leadership and stakeholder pressures. SAS embeds environmental consciousness in all aspects of the airline, diffuses and translates best practices through their numerous environmental programmes established by their ISO 140001 certified environmental management system.

Ryanair's low cost strategy results in minimal efforts towards addressing sustainability in their business model and business strategy. A learning Ryanair can take from SAS is that they should place conscious effort towards addressing sustainability to improve their environmental stewardship and sustainability standing. A learning that SAS can gain from Ryanair is that certain aspects of their low cost strategy could be of potential benefit to SAS, such as the increased focus on digital services, less waste production due to minimisation of services and aircraft maximisation.

Keywords: LCC, FSC, sustainability, business models, business strategies, environmental stewardship.

Executive Summary

Background and Problem Definition

The aviation industry is a crucial part of society and the global economy. The aviation industry is not only vitally important for the tourism sector but plays a role in powering global economic growth, enhances employment opportunities, facilitates trade links and establishes connectivity. Compared to industries such as electricity, agriculture, forestry and other land uses, the aviation industry has a low magnitude contribution to greenhouse gas emissions. In 2015, the aviation industry produced 781 million tonnes of CO_2 emissions, which is only 2% of all human-induced CO_2 emissions (ATAG, 2015). However, currently the aviation industry is predominantly reliant on finite natural resources and because it is foreseen that there will be continuous growth in the future, it is imperative that all stakeholders, particularly airlines, focus on sustainability in the medium term.

The aviation industry can be broken up into a number of categories such as private, commercial, and cargo and among others. This research focuses on the two types of airline carriers that dominate the airline industry, low cost carriers (LCC) and full service carriers (FSC). FSC are airlines whose core business are passengers, cargo and maintenance and are predominantly known as flag ship airlines. LCC are airlines known as low fare or no frill airlines and are designed to have a competitive cost advantage over FSC.

This research takes a European case study approach focusing on Ryanair, a LCC, and Scandinavian Airlines (SAS), a FSC. The aims of this research are three fold. Firstly, this research aims to construct company profiles of Ryanair and SAS including their environmental performance and key performance indicators. Secondly, this research aims to analyse how LCC and FSC have addressed sustainability in their business models and strategies. This aim required the investigation into what business models and business strategies are utilised by these two airline carrier types. Thirdly, this research aims to discuss the approaches implemented by Ryanair and SAS in addressing sustainability in their business models and strategies thereby providing learnings for both LCC and FSC. This research does not take what would seem a logical compare and contrast approach because the product features provided by LCC and FSC vary dramatically, making them completely different products.

Research Questions and Methodology

Research Question One - "What is the environmental performance and key performance indicators of both LCC and FSC?"

This question aims to construct company profiles for both Ryanair and SAS by reviewing the environmental and financial performance of these two airline carrier types. This research utilised the OECD ten key environmental indicators as a guideline to analyse, in conjunction with various airline sustainability reports, which indicators are relevant to the aviation industry. This research utilised available literature to establish the 6 key performance indicators to be analysed for Ryanair and SAS.

Research Question Two - "How does LCC and FSC address sustainability in their business models and strategies?"

This research question required investigation into Ryanair's and SAS's business models and business strategies in order to answer this question. This investigation comprised of a substantial evaluation of literature into the concept of business models and business strategies, which were related to Ryanair and SAS using articles, the airlines website and annual reports.

In addition, an in-person interview with SAS (Head of Environment and CSR department) was utilised.

To answer research question two the study took both a generic and a specific viewpoint of how sustainability can be addressed in a business. The generic stance looked at the UN Global Compact 2014 approach of addressing sustainability through three lenses: strategy, operations and culture. The specific viewpoint was taken by following the UN Global Compact Environmental Stewardship Strategy. This framework analyses whether Ryanair and SAS have followed the four key pillars established by the framework. Again, articles, airline websites, annual reports and sustainability reports were utilised to collect the information on both Ryanair and SAS, as well as the in-person interview conducted with SAS. No frameworks were found or utilised in the available literature that suited the scope of this study, thus available literature was only utilised to provide the knowledge and then extrapolated in reference to the two case study airlines.

Research Question Three – "What can LCC and FSC learn from each other in terms of sustainability?"

This research question aimed to pinpoint important aspects of the two case study airline approaches into addressing sustainability in their business models and strategies via the generic and specific stances as mentioned above and to provide learnings for both LCC and FSC.

Findings and Discussion for Both Case Studies

Research Question One: Company Profiles

Ryanair was the first LCC to originate in Europe and is now the second largest and most profitable airline in Europe. Due to minimal information published by Ryanair a comprehensive investigation into Ryanair's environmental performance could not be achieved. However, it was concluded that Ryanair has managed to reduce their CO_2 and noise emissions over the past three years. Conversely, SAS is highly transparent and informative on reporting this data. Unfortunately, SAS is experiencing increases in their CO_2 and NO_x emissions. Both airlines are experiencing decreased noise emissions due to technological improvements to their aircraft fleets. Ryanair and SAS have vastly varying financial performances due to the dramatically different business models and business strategies. Ryanair is classified as a much larger airline than SAS.

This research question did not aim to compare and contrast Ryanair's and SAS's environmental and financial performance but to provide a richer understanding into both company's profiles to provide a substantial knowledge basis for the research.

Research Question Two: How Ryanair and SAS have Addressed Sustainability

This research focused on corporate sustainability which is "a company's delivery of long-term value in financial, environmental, social and ethical terms" (United Nations Global Compact, 2014). This research explored how sustainability can be addressed in a business using three lenses. These lenses include: strategy, operations and culture. In addition, the research explored environmental stewardship using the environmental stewardship strategy. The environmental stewardship strategy outlines and describes a comprehensive approach to addressing corporate sustainability and environment management into a business based on four pillars (UN Global Compact & Duke University, 2010). The four pillars are embed,

balance, diffuse and translate. The following table highlights the findings for both case study airlines, Ryanair and SAS.

Table: Illustration of the findings discovered by the research

		Ryanair	SAS
Business Model	*Type*	Low cost business model	Traditional business model focusing on those that travel more than 5 times a year
	Value proposition	To provide the lowest possible fares to customers.	The offering of many destinations and departures, providing access to the Star Alliance programme, punctuality, safety, care, easy travel and providing services for both business and leisure travellers
Business Strategy	*Type*	Low cost	Product differentiation
How Ryanair and SAS have addressed sustainability	*Strategic Integration*	• Technological advancements: Ryanair has invested billions of euros into improving their aircraft fleet including engine technologies, winglets and other aerodynamic improvements. • Ancillary services: Reduction of waste due to no "free" meals, drinks or entertainment plus focus on less paper and use of technology (app) • Route network and airport utilisation: Use of secondary airports and point-to-point services, which increase fuel efficiency and limit emissions. However, this strategy leads to external circumstances that may not be sustainable	SAS undertakes a sustainability integration approach, which integrates sustainability into all their business functions and value chain. It is not an "add on" approach.

	Operational Integration	No sustainability integration in day-to-day operations of the airline	SAS has an environmental management system, which is certified by ISO 14001. This results in the creation of numerous environmental programmes to achieve their main sustainability focus - reducing greenhouse gas emissions. These programmes cover many areas such as fleet renewal, efficient aircraft planning, efficient usage of aircraft, environmentally adapted products, alternative sustainable jet fuels and so forth.
	Cultural Integration	• Communication and reporting: Limited reporting on environmental aspects and lack of communication. • Leadership and stakeholder pressure: Ryanair's CEO is not committed to sustainability or environmental aspects and there is a lack of stakeholder pressures to enforce sustainability	• Communication and reporting: SAS excels in this area. They have a dedicated environmental department; they establish environmental visions, goals and strategies and report on sustainability following GRI standards.
	Environmental Stewardship	1. Embedment: Ryanair does not embed environmental consciousness in the airline 2. Balance: Ryanair balances their short-term and long-term targets 3. Diffusion: Ryanair does not diffuse best practices throughout their business functions or with suppliers 4. Translation: Ryanair	1. Embedment: SAS embeds environmental consciousness throughout the entire airline 2. Balance: SAS balances their short-term and long-term targets effectively 3. Diffusion: SAS diffuses numerous best practices throughout their value and supply chain via the use of manual which have incorporated sustainability 4. Translation: SAS's environmental management system

		does not translate best practices as focuses on providing low airfares instead. Overall, Ryanair is not in good environmental stewardship standing.	ensures that best practices are translated throughout the business functions. Overall, SAS has a good environmental stewardship standing

Conclusion

Through the generic viewpoint of strategic, operational and cultural integration, Ryanair is showing promise in the strategic sphere as they are investing large amounts of capital into fleet renewal and advancement, which considerably contributes to sustainability due to reduced fuel consumption and emissions. However, in the areas of reporting, communication, stakeholder pressure, leadership and environmental stewardship, Ryanair is falling short, as they do not address sustainability in these areas. Ryanair's low cost business model and strategy effectively results in sustainability as a by-product due to their minimalistic approach. However, this strategy leads to additional consequences such as increased distances travel to airports by customers and increased utilisation of air travel due to cheap airfares that may affect sustainability negatively. This was outside of the scope of the research but is potential for future research. With regard to the environmental stewardship status, Ryanair is not in good standing because Ryanair does not embed environmental consciousness into any aspects of the airline and fails to diffuse or translate best practices throughout the airline.

In the generic viewpoint of strategic, operational and cultural integration, SAS is succeeding in addressing sustainability. This is due to their sustainability integration approach, which is facilitated by their environmental management system and environmental department. SAS places importance on reporting on their environmental impacts and sustainability efforts. SAS constructs elaborate and well thought out environmental programmes to help achieve their main goal of reducing greenhouse gas emissions.

The learning Ryanair can take from SAS is that they need to make a conscious effort towards sustainability to improve their environmental stewardship standing, such as implementing an environmental management system and constructing an environmental department, which will improve their sustainability reporting and transparency. Lastly, Ryanair's leadership needs to adapt their sustainability beliefs and values and have this filter throughout the business. SAS's is learning from Ryanair is that they should focus on implementing certain low cost strategies such as increased digital services and reduce their waste production resulting in the potential to reduce costs. In addition, SAS needs to focus on utilising their aircraft fleet to their maximum.

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1 Introduction

1.1 Background

The aviation industry plays a vitally important role in the world today. The aviation industry powers global economic growth, employment, trade links and tourism (ATAG, 2014). The aviation industry contributes to world trade by assisting countries to facilitate the global economy by increasing access to international markets and allowing for globalisation. The aviation industry is indispensable for the tourism sector, which is a major component of economic growth especially in developing economies. In 2016, 54% of tourists travelled by air globally (ATAG, 2016). The aviation industry allows for connectivity, which facilitates improved productivity by encouraging investment and innovation, improving business operations and efficiency and allowing companies to attract high quality employees (ATAG, 2016). The aviation industry is a major global employer as the industry supports a total of 62.7 million jobs, globally. In addition, the aviation industry invests substantially in infrastructure (ATAG, 2016).

The aviation industry contributes 2% of greenhouse emissions released, but compared to sectors such as electricity and heat production (25%), agriculture, forestry and other land use (24%), other industry (21%), this is an order of lower magnitude (IPCC, 2014). However, the aviation industry is important to consider when focusing on the future of the planet, as air travel is a constantly growing industry with an estimated 60% growth over the last ten years (Airbus, 2015).

The aviation industry is heavily reliant on finite natural resources and continuous growth; therefore the aviation industry cannot be determined as sustainable in the long term. Especially, as the industry foresees continued growth and increasing impacts. This requires the aviation industry to focus on sustainability in the medium term (Eurocontrol, 2017).

The reasons air travel will continue to grow are based on its convenience and opportunities for consumers such as tourism, connectivity to family and friends across the world and career prospects. In 2015, 3.5 billion passengers were carried by airlines across the world and it is estimated by Airbus Global Market Forecast (GMF) that over the next 20 years there will be a 4.5% global annual growth in air traffic (Airbus, 2015).

In 2016, 6.2 trillion kilometers were flown by passengers, 3.3 billion passengers were carried by airlines, 32.8 million scheduled commercial flights worldwide, 1 402 commercial airlines, 9.8 million passengers everyday, 104 000 flights and $17.5 billion worth of goods carried (ATAG, 2016). In 2015, air travel produced 781 million tonnes of carbon dioxide (CO_2), which correlates to 2% of all human-induced CO_2 emissions (ATAG, 2015). An estimated 80% of CO_2 emitted by aviation is from flights longer than 1 500 kilometers in distance, for which there is usually no realistic alternative form of transportation (ATAG, 2015). In 2016, over 278 billion liters of jet fuel were used by commercial operators (ATAG, 2016).

The aviation industry is made up of varying types of air travel, these include private, commercial, trade, cargo and some others. There are two types of airline carriers that dominate the airline industry; low cost carriers (LCC) and full service carriers (FSC) (Holloway, 2008). Southwest Airlines in the USA started the concept of LCC in 1970. LCC are known as a low fare or no frills airline and are defined as "an airline company designed to have a competitive advantage in terms of costs over an FSC" (Cento, 2015). Examples of LCC include Ryanair, Wizz Air, and Kulula (Global Air Transport, 2014). FSC are airlines that provide a wide range of pre-flight and on-board services such as flight entertainment, meals

and beverages, checked in baggage and so on. Examples include KLM, British Airways, and Scandinavian airline (SAS) (Reichmuth, 2008). FSC dominate the market of the airline industry. However, over the years LCC have increased their market share (Reichmuth, 2008). In 2005, LCC's market share in Europe was 17% compared to their 32% market share in 2013 (Tarmac Aviation GmbH, 2016). Currently, much of the revenue growth in the airline industry has been driven by LCC as consumer preferences drive the change in market share (Rooksby, 2015).

1.2 Problem Definition

This research will focus on LCC and FSC as these airline carrier types dominate the aviation industry, are the main form of air travel utilised by consumers and offer similar services but operate different business models and strategies.

This research has three main aims. Firstly, the research aim is to construct company profiles of environmental performance and key performance indicators for LCC, using Ryanair as a case study and for FSC, using Scandinavian Airlines (SAS) as a case study, respectively, to provide a deeper understanding into the environmental impacts of the two airline carriers and their success in achieving key business objectives. Ryanair is the oldest and largest LCC in Europe and SAS is the flagship airline in Scandinavia. The second research aim is to analyse how LCC and FSC have addressed sustainability in their business models and strategies. This aim requires an investigation into the business models and strategies utilised by these two types of companies. The third research aim is to discuss the approaches implemented by each case study company to address sustainability in its business model and strategies thereby providing learnings for both LCC and FSC.

The aviation industry has a number of negative environmental impacts due to the nature of the industry. This research highlights that it is important to have an in-depth understanding of the environmental impacts that both LCC and FSC incur on the planet. Research will be conducted to determine what the environmental performance looks like for both LCC and FSC. The research utilised OECD ten key environmental indicators to evaluate the environmental performances of Ryanair and SAS. These indicators include climate change, aircraft noise, aircraft emissions (carbon footprint, hydrocarbon, carbon monoxide and nitrogen oxide emissions), air quality, water and energy consumption and waste management (KLM, 2016). In addition, certain key performance indicators for Ryanair and SAS will be analysed to establish a deeper understanding into these two airline carrier types. Key performance indicators include indicators such as revenue passenger kilometers (RPKs) and available seat kilometers (ASKs).

LCC and FSC both have varying business models and strategies. LCC utilises a cost leadership approach to target price-sensitive travellers. Cost leadership is a business-level strategy that originates from a cost model, which focuses on reducing costs in order to charge lower fares catering for price-sensitive travellers. FSC relies on product differentiation to achieve a competitive advantage. Product differentiation is a business-level strategy that originates from a revenue model, which focuses on maximising revenues (Kee, 2015).

To become more sustainable, airline companies need to focus on sustainable business practices and address sustainability in their business models and strategies. It is important to define the meaning behind sustainability in this context. This research focuses on corporate sustainability, which is defined by the United Nations (UN) Global Compact, as "corporate sustainability is a company's delivery of long-term value in financial, environmental, social and ethical terms" (United Nations Global Compact, 2014). The UN Global Compact highlights corporate sustainability to be the incorporation of the Global Compact principles into

strategies, polices and procedures in addition to establish a culture of integrity, which is when a company upholds its basic responsibilities to people and the planet at the same time as setting the stage for long-term success (United Nations Global Compact, 2014).

The Global Compact designed the 'Environmental Stewardship Strategy' to help companies develop a holistic and comprehensive strategy to incorporate sustainability (United Nations Global Compact, 2014). Environmental stewardship is defined as the "comprehensive understanding and effective management of critical environmental risks and opportunities related to climate change, emissions, waste management, resource consumption, water conservation, biodiversity protection and ecosystem services" (UN Global Compact & Duke University, 2010). The strategy highlights a number of policies and strategies that are essential to establishing environmental stewardship as a backbone for a company's strategies such as 3R (reduce, reuse and recycle), employee training and awareness, supply chain arrangements etc. (United Nations Global Compact, 2014). In addition, this strategy highlights four key pillars for how businesses can address sustainability. This research will use the Environmental Stewardship Strategy as a framework to analyse how LCC and FSC have addressed corporate sustainability in their business models and strategies.

Prior to conducting this research, the aim was to perform a comparison and contrast analysis of FSC and LCC. However, as the research evolved it became clear that FSC and LCC vary in so many aspects that a compare and contrast analysis would not be suitable. The table below highlights the varying product features of FSC and LCC, which indicates the differences between these airline carriers. As can be seen from the summary of FSC and LCC product features, the carrier types vary hugely. They offer the same mode of transport but not the same type of service or product (see Table 1-1). Therefore, the research took the form of explorative indication research of how FSC and LCC operate and what can be learnt from these two airline carriers.

By fulfilling these aims, this research will provide knowledge into the company profiles of Ryanair and SAS and how they vary from each other as well as highlighting the differences in the business models and strategies utilised by LCC and FSC. The examination of how LCC and FSC have addressed sustainability in their business models and strategies will result in assumptions on the airlines environmental stewardship. In addition, learnings will be deduced in order to facilitate LCC and FSC to improve their environmental focus by learning from each other's sustainability business strategies.

Table 1-1 Table illustrating the product features of low cost and full service carriers (O'Connell & Williams, 2005).

Product Feature	**LCC**	**FSC**
Brand	One brand: fare	Brand extension: fare + service
Fares	Simplified fare structure	Complex fare structure + yield management
Distribution	Online and direct booking	Online, direct and travel agencies
Check in	Ticketless	Paper, Ticketless, IATA ticket contract
Airports	Mostly secondary	Primary
Connections	Point to point	Interlining, code share, global alliances
Class segmentation	One class (high density)	Two classes (dilution of seating capacity)
Inflight	Pay for amenities	Complimentary extras
Aircraft utilisation	Very high	Medium to high: union contracts
Turnaround time	25 minute turnaround	Low turnaround: congestion + labour
Product	One product: low fare	Multiple integrated products
Ancillary revenue	Advertising, on board sales, baggage, seats	Focus on the primary product
Aircraft	Single type: commodity	Multiple types: scheduling complexities
Seating	Small pitch, no assignment	Generous pitch, offer seat assignment
Customer service	Generally under performs	Full service, offers reliability
Operational activities	Focus on core (flying)	Extensions e.g., maintenance, cargo

1.3 Research Questions

This research is composed of three research questions to fulfill the aims of the research. As mentioned above, the aims of this research include constructing company profiles of environmental performance and key performance indicators for Ryanair and SAS, determining how Ryanair and SAS have addressed sustainability in their business models and strategies and discussing the learnings for both LCC and FSC.

The following is the three research questions directing the research.

- Research Question One: "What is the environmental performance and key performance indicators of both LCC and FSC?"
- Research Question Two: "How does LCC and FSC address sustainability in their business models and strategies?"
- Research Question Three: "What can LCC and FSC learn from each other in terms of sustainability?"

1.4 Limitations and Scope

The original scope of this research was to analyse two LCC case study airlines and two FSC case study airlines in the European context. However, due to difficulties with establishing contact with specific case study airlines and time limitations, the research focuses on one LCC case study (Ryanair) and one FSC case study (Scandinavian Airline (SAS)), the scope of the research nevertheless focused on Europe as the backdrop.

A major limitation of the research was establishing communication with airline companies, as contact information was not readily available to the general public. The airline websites are used as a portal to provide a service (air travel) thus the company and employee information is not displayed. In addition, the airlines are overloaded with other pressing issues to spare time for researchers.

Furthermore, a limitation of the research is that there are not copious amounts of available literature on the topic of addressing sustainability business practices in business models and business strategies in the aviation industry. With regards to the environmental performance analysis for both LCC and FSC, the researcher-experienced difficulties in collecting this data due to a lack of previously conducted findings in available research of this area of the aviation industry.

1.5 Audience

This research has four audiences it wishes to address. The first audience is the two case study airline companies (Ryanair and SAS) as it aims to provide an understanding into how LCC and FSC operate with regards to sustainability. The research aims to provide pointers for the companies as to how they can improve their environmental status in the market and facilitate sustainability in the long term.

The second audience is the wider aviation industry by providing knowledge on the different types of sustainability practices and strategies available to airline companies and to highlight the importance of sustainability integration into a business.

The third audience is for consumers of air travel to provide consumers with a deeper understanding of airline companies' efforts towards sustainability

The fourth audience is academic researchers who have a particular interest in the topic of sustainability in the field of business models and business strategies and this study could serve as an example in the European aviation industry.

1.6 Disposition (Outline)

Chapter 1 presents the nature of the problem addressed in this research. The content then identifies research limitations, provides a research outline and describes the intended audience.

Chapter 2 presents a more thorough analysis of the research field in the form of a literature review.

Chapter 3 presents the methods of the research to provide a better understanding of how the research was conducted.

Chapter 4 presents the main findings to answer the research questions.

Chapter 5 presents the analysis and discussion of the research questions.

Chapter 6 presents the main conclusions of the analysis, explains how the work contributes to the literature, and then provides recommendations directed to the principal audiences. This final chapter then outlines areas of future research.

2 Literature Review

The literature review provides a brief and balanced review of the pertinent published literature available relating to the research subject. This covers the aviation industry with a specific focus on the European airline industry, the impacts associated with the aviation industry, what low cost carriers (LCC) and full service carriers (FSC) are, the theory behind business models and business strategies, a brief description of sustainable business strategies and business models, information on what sustainability means in the context of this research and a description on generic and specific measures to addressing sustainability in a business.

2.1 Airline Carrier Types

2.1.1 Low Cost Carriers

The deregulation of the airline industry in 1965 encouraged the establishment of an international market for all airlines, which helped global development, provided customers with a wider range of options and increased efficiency as non-performers had to shut down. This deregulation created a favourable environment for LCC to emerge and prosper (Sarker *et al,* 2013).

The concept of low cost carriers (LCC) began with Southwest Airlines in United States in the 1970s. Ryanair in Europe followed the Southwest model in 1991. LCC have a number of definitions. They are known as "low fare" or "no-frills" airlines as well as an "airline company designed to have a competitive advantage in terms of costs over an FSC" (Cento, 2009).

The LCC business model is simple compared to the full service carrier (FSC) business model. The core business of a LCC is passenger air-service. LCC operate point-to-point networks. This being the network is created from one or a few airports known as the "bases" from which the carrier operates its routes to main destinations. All passengers in this network board at flight origin and deplane at the destination (Cook & Goodwin, 2008). LCC provide no connections at these airport bases. LCC mainly operates out of secondary airports as the landing tax and handling fees are less expensive and the airports are less congested. LCC generally operate one type of aircrafts, the Boeing 737, which transports 149 passengers. LCC are utilised at a higher rate than FSC. LCC are termed as 'no frills' service as they provide no lounge services, choice of seats, in-flight services such as entertainment and food and beverages (for a charge) and no frequent flyer programmes. LCC operate an electronic distribution system, therefore tickets are sold electronically and sent to consumers via email (Cento, 2009).

LCC provide ancillary services where they generate a large portion of their revenue. These include excess luggage charges, inflight food and beverages, and advertising space. A study by Cento (2009) established that "overall, the LCC model can operate at 49% of FSC costs" (Cento, 2009). Therefore, LCC has 51% cost advantages in relation to FSC. Of this 51% of cost differences between LCC and FSC, 37% is credited to their explicit network and airport choices, another 9% is due to advantages from LCC distribution systems and commercial agreements and a surprisingly small amount, 13%, of the cost differential between LCC and FSC is due to product and in-flight service features (this including minimal station costs, outsourcing handling and no free in-flight catering) (Cento, 2009).

2.1.2 Full Service Carriers

A full service carrier (FSC) is an airline whose core business are passengers, cargo and maintenance. FSC operate hub-and-spoke networks. A hub-and-spoke network is a system where all passengers expect those whose origin or destination is the hub, transfer at the hub for an additional flight to their final destination (Cook & Goodwin, 2008).

FSC operate domestic, international and inter-continental markets with short, medium and long haul flights. FSC have differentiated themselves through vertical product differentiation, which includes in-flight and ground service, electronic services such as Internet check in, and travel rules. FSC focus a lot of attention on customer relationship management (CRM). This includes loyalty programmes to retain frequent flyers. CRM is a tool to better manage customers' needs and desires through reliable processes and interactions with the customers. CRM enhances the customers buying and travel experience (Cento, 2009).

FSC operate through numerous sales channels. These categories include indirect off-line (travel agencies), indirect online (web electronic agents), direct online (purchases via airlines website), direct off line (purchase via the airlines call centre), airline city offices or airline airport offices (Cento, 2009).

2.2 Business Models and Business Strategy

The global airline industry has gone through a number of alternating periods from survival, to adaptation, to recovery, to innovation, resulting in the need for flexible business strategies and models (Wensveen & Leick, 2009). To conduct the intended research on the sustainability analysis of LCC and FSC, it is important that an in-depth understanding is achieved into what business models and business strategies are. What business models are, what business strategies are and the different types of strategies implemented and utilised by businesses will be described below.

2.2.1 What is a Business Model?

There are a number of varying definitions and concepts around business models. This sections aims to bring together these varying definitions in one place to provide the audience with an understanding of what a business model entails.

A common description of a business model is "a business model describes the value an organization offers its customers and illustrates the capabilities and resources required to create, market and deliver this value and to generate profitable, sustainable revenue streams" (Osterwalder *et al,* 2005).

Business models are the design of the value creation, delivery and capture mechanisms employed by a business. The key role of the business model is to define the manner in which the business delivers value to its customers, entices customers to pay for the value and how it converts revenue into profit. The business model outlines the architecture of revenues, costs and profits associated with the business delivering value. The business model is the organisational and financial architecture of a business (Teece, 2010).

Therefore, a business model is made up of four building blocks. These being: value proposition, value architecture, revenue model and cultures and values (Casadesus-Masanell & Ricart, 2009). The value proposition is what value the business creates and for whom they create this value. Value architecture is how the business creates this value for their customers. Revenue model is how the business generates profits and culture and values, is what values

does the business pursue and communicate internally and externally (Casadesus-Masanell & Ricart, 2009).

A business model communicates the logic, data and other evidence that supports a value proposition for the customer, and is a viable structure of revenues and costs for the business delivering that value. A business model is about the benefit the business will create for the customer, how the business will establish this benefit and how the business will generate revenue from the value it delivers. Business models are at the forefront of strategic management thinking and are more generic than a business strategy (Teece, 2010).

There are a few tools that can be utilised to construct a summarised visual of a company's business model (Figure 1-1). The business model canvas is the tool that will be utilised in this research and thus it needs to be described in some detail. The business model canvas is a visual tool to simplify the business model by making it easier to understand and illustrates how the various components of the business affect each other. The business model canvas consists of nine interrelated building blocks. The canvas is used to design a business model as a diagnostic tool and aids in scenario planning as well as defining a business model (MaRS, 2012).

The components include customer segments, which describes the target customer for the business. Value proposition is the component that links upstream activities with downstream activities and is the value that is created for customers. Channels are the communication established with customers to create the value proposition and is divided into three different factors, being: communication, sales and logistics. Communication is the channel used by the business to communicate with the customers such as direct personal contact, interactive media and so on. The sales channel is where buyers and sellers approve of a transaction. These include direct channels, intermediary channels such as agents or distributor, retail and the Internet. Logistics is the channel the business uses to physically deliver the product or service to the customer (MaRS, 2012).

Customer relationships are the nature of the relationship the business has with customers. Revenue streams refer to the means that the business undertakes to generate revenue such as subscription based or advertising based. Revenue streams are central to the business model. Key resources refer to the resources that are required to create the value proposition for the customer. Therefore, it refers to relevant intellectual property, technical expertise, human resources, financial and physical assets, key contracts and relationships. Key partners refer to the relationship with key individuals that help create the value proposition for customers. Key activities are the key processes that are necessary to merge your resources with resources provided by key partners to deliver the value proposition to customers, manage channels and relationships and generate revenue. Examples include research and development, production, marketing, sales and customer service. Cost structure refers to the costs involved in delivering the value proposition to customers, which includes the key resources and key activities included (MaRS, 2012). Figure 1-1 is an example of what the business model canvas looks like.

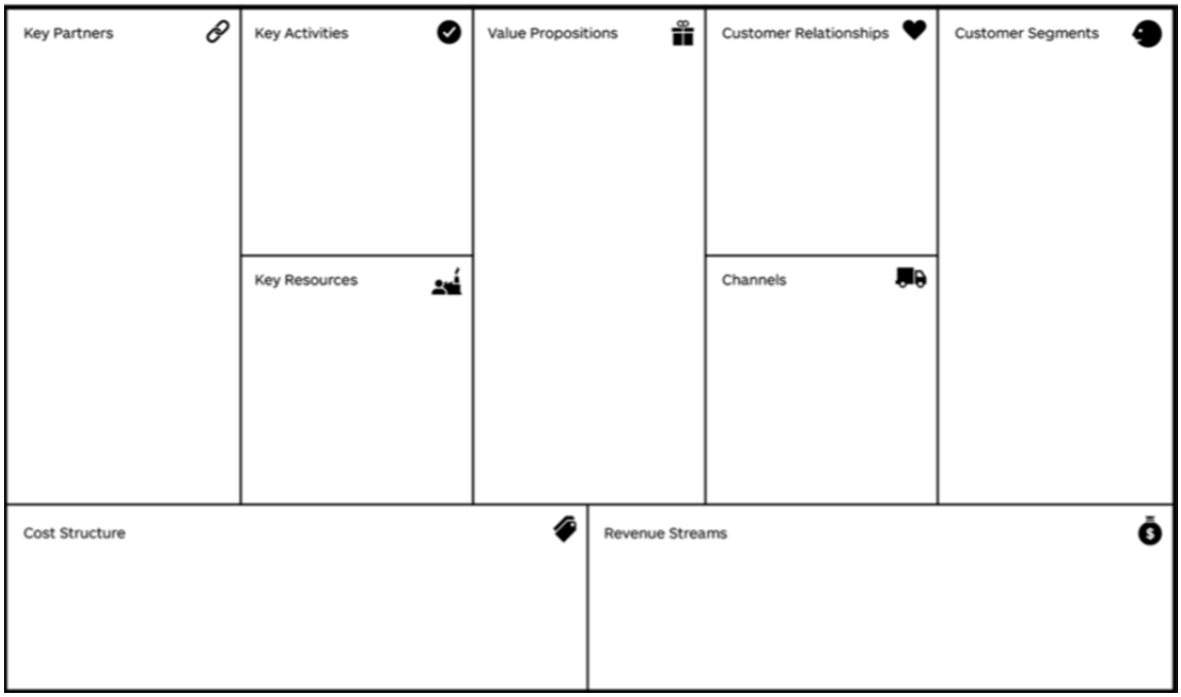

Figure 1-1 Business model canvas template (Strategyzer AG, 2016).

2.2.2 What is Strategy in Terms of Business?

In addition to the research regarding business models utilised by LCC and FSC, the research aims to explore the business strategies that are implemented and utilised by LCC and FSC. Therefore, what a business strategy is will be described to ensure a deeper understanding as well as to point out the differences between business strategy and business model. The acquired knowledge on business model and strategies will facilitate the analysis of how sustainability has been addressed in LCC and FSC business models and business strategies.

When it comes to business strategy the most well-known and widely used concept is the one termed by Michael Porter. According to Michael Porter (1991) strategy is the act of bringing a company into line with its business environment to maintain a dynamic balance (Penttinen, 2008). Therefore, the strategy is the business game plan. All businesses have strategies that they follow, whether planned or unplanned. Business strategy is the selection of ideas and assets created by a business to meet their long-term goals (Formisano, 2003). Some additional definitions of strategy include: "a plan, method, or series of actions designed to achieve a specific goal or effect" (Wordsmyth Dictionary, 2015), "the determination of the long-run goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals" (Chandler, 1962) or "strategy is the pattern of objectives, purposes, or goals and the major policies and plans for achieving these goals, stated in such a way as to define what business the company is in or is to be in and the kind of company it is or is to be" (Andrews, 1971).

The purpose of business strategy is to provide direction and to deploy resources in the most effective manner and to coordinate the decisions made by different individuals within the business. Strategy is the overall plan for deploying resources to establish a favourable position. Strategic decisions have three characteristics. These being: they are important to the business, they involve a significant commitment of resources, and they are not easily reversible. Strategy refers to the means by which businesses achieve their objectives. Strategy is focused on achieving certain goals, the critical actions that make up a strategy involve the allocation of

resources and a strategy implies consistency, integration or cohesiveness (Penttinen & Pohjola, 2008).

Strategy has a number of roles to play. Strategy improves decision making via simplifying decision making by reducing the amount of decision alternatives considered and by acting as a heuristic that reduces the search necessary to find an acceptable solution to a decision. Strategy drives processes to allow for the knowledge of different individuals to be compiled and integrated. Strategy drives processes to also facilitate the use of analytic tools. Strategy is a coordinating tool as it promotes communication in several ways (Penttinen & Pohjola, 2008).

Strategy can be divided into two categories: corporate strategy and business strategy (Grant & Jordan, 2015). Corporate strategy refers to the scope of the business in terms of the industries and markets in which it competes. Corporate strategy decisions involve vertical integration, investments into diversification measures, acquisitions and new ventures, and the supply and distribution of resources within the business and disinvestments. Business strategy focuses on how the business competes within a particular industry. If a business is to excel in an industry, it needs to establish a competitive advantage over its competitors. Therefore business strategy is also known as competitive strategy. Corporate strategy is typically the responsibility of the top management team and the corporate strategy staff. Business strategy is primarily the responsibility of divisional management (Grant & Jordan, 2015).

The use of business strategy results in certain positioning of the businesses within the industry. The positioning of a business determines whether a business is profitable. There are three generic business strategies that help position a business within the market: cost leadership, differentiation and focus (Sørenson, 2005). Figure 1-2 highlights the different strategies with regards to competitive advantage and competitive scope

		Competitive Advantage	
		Lower Cost	Differentiation
Competitive Scope	Broad Target	Cost Leadership	Differentiation
	Narrow Target	Cost Focus	Differentiation/Focus (Stuck in the middle)

Figure 1-2 Illustration of Porters generic strategies (Sørenson, 2005).

Cost leadership is a strategy that aims to make the business the lowest cost producer in the industry. This type of business typically operates on a broad scope. The requirements to implement this strategy include the construction of efficient facilitates, strong pursuit of cost reductions, avoidance of marginal customers accounts and cost minimisation in service, sales, marketing and so on (Sørenson, 2005). This strategy provides competitive advantage as lower costs yields higher returns. This strategy results in defence against powerful buyers as their power only extends to the lowest price on the market, as well as protection against suppliers, as the low cost strategy ensures flexibility against increasing costs. This strategy creates strong

barriers to entry to the industry for incoming businesses due to cost advantages faced by existing businesses (Sørenson, 2005).

Differentiation strategy also operates on a broad scope but offers a product or service that is perceived as unique in the industry and widely valued by customers. Exclusivity is not a problem or a hindering factor because the businesses are offered a premium price for it (Sørenson, 2005).

The focus strategy has a very narrow competitive range within an industry. The strategy entails the business selecting a segment or group of segments within the industry. This Strategy is shaped to serve the businesses narrow strategic target more effectively and efficiently (Sørenson, 2005).

2.3 Environmental Performance

2.3.1 Environmental Impact Categories

Environmental indicators are essential tools for tracking environmental progress; furthermore they support policy evaluation and inform the public. The Organisation for Economic Co-operation and Development (OECD) has been a pioneer in the field of environmental indicators, of which they have established and published the first set of international environmental indicators. The OECD is an intergovernmental economic organisation originating in 1960. It consists of 35 member countries aiming to encourage economic growth and world trade (Organisation for Economic Co-operation and Development, 2017). These environmental indicators are utilised regularly in these countries environmental performance reviews and other policy analysis work (OECD, 2008).

OECD has minimised a large set of environmental indicators to a shortlist of key environmental indicators. The following table illustrates the 10 key environmental indicators constructed by OECD.

Table 2-1 The ten key environmental indicators by OECD (OECD, 2008).

		Key Indicator
	Pollution Issues	
1	Climate Change	CO_2 and greenhouse gas emissions intensities
2	Ozone Layer	Ozone depleting substances
3	Air quality	SOx and NOx emission intensities
4	Waste generation	Municipal waste generation intensities
5	Freshwater quality	Waste water treatment connection rates
	Natural Resources and Assets	
6	Freshwater resources	Intensity of use of water resources
7	Forest Resources	Intensity of use of forest resources
8	Fish Resources	Intensity of use of fish resources
9	Energy Resources	Intensity of energy use
10	Biodiversity	Threatened species

This research aims to construct an environmental performance profile for LCC and FSC, which entails the evaluation of the following ten key OECD environmental indicators. However, not all of these ten key environmental indicators are relevant to the aviation industry.

The first environmental indicator that is relevant to the aviation industry is climate change. Climate change is the change in the atmospheric concentration of greenhouse gasses, which affects the global climate. This is measured in kg CO_2 equivalents. The second environmental indicator with regard to this industry is air quality, which is an indication of environmental impacts based on NO_x and SO_2 emissions. These emissions result in changes in soil acidification that effect the growth conditions of plants (Jemioło, 2015). The third environmental indicator to evaluate is waste generation as airline flight operations result in the production of waste. The fourth environmental indicator to explore is freshwater resource as airline operations utilise water in their operations. The last environmental indicator that is relevant to the aviation industry is energy resource, as airline operations require the utilisation of energy in their processes (OECD, 2008). This indicator includes the ground handling of flight operations, which comprise of indicators such as glyocol fluid consumption; CO_2 vehicle petrol, CO_2 vehicle diesel, and fuel spill instances (SAS Sustainability Report 2015/2016, 2016).

An additional environmental indicator that is not highlighted by OECD but is relevant to the aviation industry and is emphasised in numerous sustainability reports constructed by airlines in Europe is noise pollution.

2.3.2 Key Performance Indicators

The research aims to conduct a company profile based on key performance indicators, which are relevant to the aviation industry. Therefore, the research will explore both operational variables and financial ratios. Demydyuk (2011) concluded the main operational measurements relevant to the aviation industry via the use of airline annual reports and available literature on airline economics. These main operational measurements are illustrated and described in Table 2-2.

Table 2-2 Table illustrating the key operational performance indicators with descriptions (Demydyuk, 2011).

Indicator	Description
ASK (available seat kilometres)	Obtained by multiplying the number of seats available for sale on each flight by the stage distance flown
RPK (revenue passenger kilometre)	Obtained by multiplying the number of fare paying passengers on each flight by flight distance
Load Factor (passenger load factor)	RPK expressed as a percentage of ASK
Number of passengers (PAX)	Equals the number of passengers which boarded each aircraft and summed over a certain period of time

ASK refers to the total flight passenger capacity of an airline in kilometers. Therefore, ASK highlights the supply provided by an airline (Jadhav, 2016). RPK refers to the number of kilometers travelled by paying passengers. Therefore, RPK measures the actual demand for air transport for a particular airline (Jadhav, 2016). It is important that airlines try match their ASK with the RPK, hence the supply with the market demand. RPKs provide airline management with a clear indication of the demand of the market. To improve airlines RPK,

the airline could add more seats to increase capacity for the market or to improve efficiency. RPK is used to calculate load factor and yield (Jadhav, 2016).

ASK helps an airline to match supply with the market demand as a shortage of capacity, thus seats, often results in higher fares and excess capacity results in reduced margins leading to higher fixed costs. Therefore, a challenge for airlines is to achieve the perfect ASK. ASK are particularly important for FSC as the indicator is utilised to help qualify which aircraft type to fly for certain routes depending on the demand (Jadhav, 2016).

Traditional financial ratios are used to indicate profitability and efficiency in an airline. These ratios include yield and cost per ASK. Table 2-3 illustrates the description of these financial ratios. Yield is the measure of the average fare paid per kilometer, per passenger. Yield is usually expressed in cents per kilometer. Yield is a useful indicator for assessing changes in fares over a period of time. However, yield is not a valued indicator for comparing airlines as it varies considerably due to flight path length and does not include load factor (Airline Data Project, 2016). Cost per ASK (CASK) is the measure of unit cost for the airline. Therefore it is the cost incurred by the airline per available seat kilometer (Airline Data Project, 2016).

Table 2-3 Table illustrating financial ratios relevant to the aviation industry (Demydyuk, 2011).

Indicator	**Description**
Yield	The average revenue collected per passenger kilometre or RPK. Calculated by dividing the totally passenger revenue on a flight by the passenger kilometres generated by that flight
Cost per ASK	Calculated by dividing total operating cots by total ASKs.

Additional financial variables that are valuable to the construction of the company profile include total revenue connected to scheduled passenger traffic, operating costs excluding interest expenses, taxes, extraordinary items and other non-operating expenses, both detailed and total, and operating profit (Demydyuk, 2011).

According to Doganis (1985), the profitability of an airline depends on the interplay of three variables: the unit costs, the unit revenues or yields and the load factors achieved. These indicators are important to an airline as to determine their pricing strategy and calculate various tariffs; airlines must balance and assess all these indicators, which convert the ticket fares into average yield. Doganis states that it is the yield in conjunction with the achieved load factors and unit costs, which determine whether an airline's revenue and financial targets can be obtained. To assure such achievements revenue management processes, also known as yield management, are applied (Demydyuk, 2011).

Yield management is a set of techniques implemented by the airline carrier to allocate limited and highly perishable resources among differentiated customers. The goal of yield management is to maximize the operating revenue generated by the airline in a complex market environment (Keynes, 2009).

2.4 Sustainability

2.4.1 What is Corporate Sustainability?

The UN Global Compact defines corporate sustainability, as "corporate sustainability is a company's delivery of long-term value in financial, environmental, social and ethical terms"

(United Nations Global Compact, 2014). The UN Global Compact defines five features of corporate sustainability: principled business, strengthening society, leadership commitment, reporting progress and local action. These five features are what businesses should strive towards if they wish to be responsible businesses with regards to sustainability integration (United Nations Global Compact, 2014). Each feature will be described in more detail below.

Respecting principles in a company's operations and supply chains is a baseline for corporate sustainability. These principles provide common ground for partners, a moral code for employees and an accountability measure for critics. Companies are beginning to find real value in actively addressing social, environmental and governance issues (United Nations Global Compact, 2014).

The strengthening society feature refers to the act of companies seeing beyond their own walls and taking actions to support the communities around them. Therefore, companies aim to be active stakeholders in communities for long-term periods (United Nations Global Compact, 2014).

The leadership commitment feature refers to the concept that effective change begins with leadership, as leadership can send strong signals throughout the company that sustainability matters and all responsibilities are important. This feature involves instilling action in a number of key areas such as adjustment to policies and practices, training and motivating employees, pushing sustainability into the supply chain and disclosing efforts and outcomes (United Nations Global Compact, 2014).

The reporting progress feature refers to companies being more transparent about their practices and efforts. A priority is to establish ways to better measure sustainability impacts, which will facilitate effective corporate strategies, inform communities and stakeholder dialogues and guide investor decision-making. Local action, the fifth feature, refers to the local focus of businesses (United Nations Global Compact, 2014).

2.4.2 Environmental Stewardship

Environmental Stewardship is defined as the comprehensive understanding and effective management of critical environmental risks and opportunities related to climate change, emissions, waste management, resource consumption, water conservation, biodiversity protection and ecosystem services (UN Global Compact & Duke University, 2010).

Focus on environmental stewardship is the incorporation of sustainability into a business. There are four universal approaches to environmental stewardship within companies. First, is the embedment of environmental stewardship into all aspects of the business by leaders. Second, is the balance between short-term targets and long-term goals, which are both critical to performance and environmental stewardship. Third, is the diffusion of best practices throughout value chains and business networks by collaborating and engaging stakeholders. Fourth, is the translation of best practices into processes and practices that are applicable in the diverse areas in which they operate (UN Global Compact & Duke University, 2010).

Sustainable companies do not only embed, balance, diffuse and translate environmental practices but they take a comprehensive, cyclical approach to management. Therefore, companies implement all four strategies while embarking on an on-going process of commitment to environmental goals, establishing targets, analysing performance, interacting with stakeholders and so on (UN Global Compact & Duke University, 2010).

2.5 Addressing Sustainability in Businesses

An increasing number of businesses are focusing on addressing sustainability. Businesses are becoming increasingly aware that customers are no longer satisfied with businesses that only focus on short-term profit maximisation. Customers want to support businesses that integrate sustainability into their business practices therefore focusing on social and environmental impacts. Businesses are aware that sustainability-related strategies are becoming necessary to be competitive (Eccles *et al,* 2012).

A study was conducted in which it was understood that companies significantly outperform their competition over a 18 year period in terms of both stock market and accounting criteria such as return on assets and return on equity if they incorporate sustainability (Eccles *et al,* 2012). For companies to become more sustainable they must encompass a conscious and continuous effort to build long-term value for shareholders by contributing to a sustainable society (Eccles *et al,* 2012).

2.5.1 Generic Integration of Sustainability

There are a number of ways to address sustainability in businesses. One way focuses on leadership, which is an important factor for promoting the commitment of an organisation as a whole and drives cultural values towards commitment. Green practices are undertaken when management cultivates employee commitment to a socially responsible business (Petrini and Pozzebon, 2010). Strong leadership provides motivation for employee engagement because employees are aware that their leaders are engaged and care about the sustainability focus (Eccles *et al,* 2012).

Second, is through institutional mechanisms such as communication and training. To achieve organisational commitment and to remove obstacles to changes in attitude and involvement, well-defined training and communication plans are important. This promotes a clear understanding of the role and importance of sustainability practices for the business strategies and goals. This leads to corporate reporting which is a tool to promote adequate education and information on the importance of sustainability within the business (Petrini & Pozzebon, 2010).

Third, is stakeholder pressure, which results in the encouragement of stakeholders to invest and stimulate sustainability growth within the business. Fourth, is top and lower level commitment and fifth, is governance (Petrini & Pozzebon, 2010).

Sustainability can be also addressed in a business using three lenses. These lenses include: strategy, operations and culture. Strategic integration of sustainability is the incorporation of sustainability into the core strategy of an organisation. Sustainability needs to be woven into the core business strategy rather than tackled as an optional activity. For this integration to occur the functional leaders need to be aboard to integrate sustainability into the functions purpose, priorities and goals (United Nations Global Compact, 2014).

Operational integration is the execution and review of the performance of sustainability-related strategies in the regular routine of an organisation. This integration refers to the processes, policies and practices put in place to improve the execution of strategy. The integration of sustainability into the businesses existing operational routine reinforces the purpose, priorities and goals described in the strategy, in addition to the enhancement of the desired new behaviours to create new norms and habits (United Nations Global Compact, 2014).

Cultural integration is the leveraging of the unique identity, culture purpose and strength of a business to advance sustainability and corporate success. The integration of sustainability aims to better engage employees to improve collaboration, synergies and innovation (United Nations Global Compact, 2014).

Benefits from addressing sustainability include cost savings from reduced waste of resources such as energy and water, growth opportunities through developing innovative products, better risk management and increased brand reputation with customers and employees and another reason is responsible innovation. Consumers are becoming more aware of social and environmental issues (EY, 2015). Sustainability has the potential to reduce risk, improve productivity, enhance growth and create shared value if it is integrated across the business (United Nations Global Compact, 2014).

2.5.2 Environmental Stewardship Strategy

The Global Compact's Environmental Stewardship Strategy was designed to help companies develop a holistic and comprehensive strategy to incorporate sustainability (UN Global Compact, 2014). The environmental stewardship strategy aims to facilitate the implementation of the environmental principles established by the UN Global Compact. The environmental stewardship strategy developed a wheel that identifies the steps that need to be taken to implement the strategy. It starts with recommit, assess, declare, engage, perform, evaluate, anticipate, disseminate and steps start again (UN Global Compact & Duke University, 2010).

The following points are the types of policies and practices essential to establishing environmental stewardship into a company's strategies: management systems, technology assessment, life cycle assessment/costing, water foot printing, risk and impact assessment, performance targets/indicators, cleaner and safe production, consumption and responsible use targets, 3R (reduce, reuse and recycle), employee training and awareness, supply chain arrangements, monitor and evaluate performance, report emission, public discourse of policies and practices and mutli-stakeholder dialogue (United Nations Global Compact, 2014). This research will analyse how the LCC and FSC airline companies have integrated these policies and practices into their business models and strategies.

The environmental stewardship strategy outlines and describes a comprehensive approach to addressing corporate sustainability and environment management into a business based on four pillars (UN Global Compact & Duke University, 2010). The four pillars are:

1. Leaders must *embed* environment stewardship into all facets of the business,
2. Short-term targets and long-term goals must be *balanced* as both are critical to performance and environmental stewardship,
3. Leaders must *diffuse* sustainable best practices throughout the value chains and business networks by collaborating and engaging stakeholders,
4. Leaders must *translate* sustainable best practices into processes and practices that are applicable in the various geographies the business operates in.

Therefore, the four pillars are embed, balance, diffuse and translate. Furthermore, the leading businesses in addressing corporate sustainability do not just embed, balance, diffuse and translate environment practices but take a comprehensive, cyclical approach to management. This meaning they implement all four strategies while embarking on an on-going process to commit to environmental goals, assessing current performance, declaring targets, engaging with cross-sector stakeholders, performing against targets, evaluating performance, anticipating future challenges and disseminating best practices (UN Global Compact & Duke University, 2010).

3 Methodology

From detailed investigation into the aviation industry it became clear that there has been very little focus on sustainability in the context of LCC and FSC airline business models and strategies. This stimulated the interest into researching how LCC and FSC address sustainability in their business models and strategies.

The scope of this research established was in a European context. Europe is a geographical region that contributes substantial to the aviation industry and the MESPOM programme has a strong European educational focus, which would like to be followed through in this research.

This research took a case study analysis approach. One LCC airline and one FSC airline were chosen as the case studies for the research. Due to limitations mentioned in Chapter 1, the research was restricted to a sample size of two case studies. The case studies choosen were, Ryanair for LCC. Ryanair was the first LCC airline in Europe. Scandinavian Airlines (SAS) was choosen for FSC, as they are the flagship airline for the Scandinavian countries. Ryanair and SAS have relatively substantial amounts of available literature, which was a major consideration when choosing which case study to analyse.

This research required a fundamental understanding of numerous concepts to be able to analyse the questions posed by the three research questions. The literature review established the context of the research by providing a brief and informative review of the pertinent published literature that is available on the subject. Some of these aspects that required explanation included what a LCC and FSC are, what a business model is, what strategy is in terms of business, what sustainability is in this context, and how sustainability can be integrated into businesses. These aspects were explained in a simple and understandable manner in relation to the research topic, the aviation industry, via the use of available literature. The literature included research papers and journals. The literature was found over the Internet by searching key words such as "business models" "business strategy" "aviation industry" "sustainability and business practices" and so on.

This research was conducted in the order of the three research questions respectively, as each research question provides a basis for the proceeding research question. The research was conducted through a mixture of research types including a descriptive research approach utilising available literature and qualitative data derived from in-person interviews. The methodology for the three research questions will be explained in detail below.

3.1 Research Question One Methodology

Research question one, "What is the environmental performance and key performance indicators of both LCC and FSC?" aimed to construct company profiles for both Ryanair and SAS by reviewing the environmental and financial performance of these two airlines. This required the establishment of key environmental indicators to be analysed. The research utilised OECD ten key environmental indicators as a guideline to analyse in conjunction with various airline sustainability reports such as SAS and KLM, which of these ten OECD environmental indicators are relevant to the aviation industry.

The key environmental indicators data was readily available for SAS but Ryanair does not produce the same standard of sustainability reports thus relevant data was missing from the analysis. In addition, Ryanair was non-responsive when contacted to obtain this data. Consequently, the research only focused on carbon and noise emissions for Ryanair.

The research utilised the available article by Demydyuk 2011, *optimal financial key performance indicators: evidence from the airline industry*, to determine the key performance indicators that are most commonly utilised in the aviation industry. This resulted in the establishment of 6 key performance indicators to be analysed for the two case study airlines. In addition, Demydyuk 2011 was used to provide descriptions of each of these performance indicators.

Ryanair's 2015 and 2016 annual report and SAS's 2015/2016 sustainability and annual reports were utilised to identify as many of these key performance indicators as possible for the two case studies. With as much data obtained as possible on both environmental and key performance indicators the research analysed with connection to available literature the significant aspects of both case study airlines company profiles.

3.2 Research Question Two Methodology

Prior to the investigation of research question two, the researcher felt it important to establish background findings on the two case study airlines to provide a deeper understanding into the background of the airline, such as their origin, main features, and various statistical information. A number of resources were utilised for this purpose ranging from journal articles, research papers, company websites, sustainability and annual reports.

Furthermore, the research focuses on the business models and strategies of these two case studies, Ryanair and SAS. A section in the literature review was established via the use of available literature on the topic to examine the concept behind business models and strategies. The available literature was discovered through the use of Google by searching key words such as "what is a business model", "what is business strategy", "what is the difference between business model and business strategy" and so on. From the in-depth research into these two concepts the researcher was aware of what these concepts entail, which allowed for the next step of the research.

3.2.1 Business Model Methodology

The next step was to construct a profile of Ryanair and SAS business models. There was not found any relevant framework available to analyse an airline's business model that suited the direction of this research, thus presenting as a challenge for the research. Therefore, the study conducted extensive research into what a business model is and what tools can be utilised to summarise a business model. From this research Ryanair and SAS business models were constructed.

A paper by Casadesus-Masanell & Ricart 2012, *from strategy to business models and to tactics*, highlighted the four building blocks that construct a business model. This notion was utilised to elaborate on Ryanair's and SAS's business models. Each building block was evaluated to determine how Ryanair and SAS function within these aspects. Furthermore, the business model canvas tool was utilised to provide a visual representation of the business models of Ryanair and SAS. This was to provide the audience with a quick and easy overview of the business model utilised by LCC and FSC.

The literature used for the construction of Ryanair's business model consisted of using all available literature, particularly papers by MaRS 2012 and Sørenson 2005, and information from Ryanair website and reports. For SAS, predominately their sustainability reports, annual reports and website was utilised to construct a profile on the airlines business model as well as data collected from an interview conducted with SAS's head of the Environment and CSR department.

3.2.2 Business Strategy Methodology

The next step was to construct a business strategy profile for Ryanair and SAS. Again, there was no relevant ready framework in the available literature that the researcher wanted to utilise, to determine the business strategies undertaken by Ryanair and SAS, which posed as a challenge for the research. Consequently, from extensive research on what a strategy is, the researcher was able to deduce the particular characteristics of the airlines strategies. This step entailed the definition of which business strategy, in accordance with Porter's four generic strategies, are implemented by the two case study airlines. For Ryanair, this was determined by the use of papers by MaRS 2012 and Sørenson 2005 and Ryanair's website. For SAS, this was determined by the use of their annual report, website and qualitative data collected from the interview.

Interview questions were established based on the acquired knowledge into business models and strategies through the literature review. The interview questions aimed to acquire first hand knowledge on what business model and strategies are utilised by the case study airlines and ensure that the available literature is providing accurate information.

3.2.3 Research Question Two

Research question two, "How does LCC and FSC address sustainability in their business models and strategies?" requires the research to analyse extensively how sustainability is being addressed within Ryanair and SAS business models and business strategies.

The first step was to determine how a business could address sustainability in a generic manner to provide specific areas to focus on in the two case study airlines business models and strategies. A research paper by Petrini and Pozzebon 2010, *Integrating sustainability into business practices,* highlighted areas within a business to focus upon namely: leadership, institutional mechanisms, stakeholder pressures, top and lower level commitment, governance (Petrini & Pozzebon, 2010). In addition, the UN Global Compact 2014 highlights three lenses through which sustainability can be addressed in a business. These being: strategy, operations and culture (United Nations Global Compact, 2014). These findings acted as the key pillars to determine how Ryanair and SAS have addressed sustainability.

This research also focused specifically on the United Nations Global Compact Environmental Stewardship Strategy, which is explained in more detail in Chapter 2. This strategy was utilised as a framework in this research by analysing whether either of the two case study airlines have followed the four key pillars established by the Environmental Stewardship Strategy.

For Ryanair, Sørenson (2005), Casadesus-Masanell & Ricart (2012), Ryanair 2015 and 2016 annual reports and Ryanair's website were used to highlight the areas that Ryanair focuses on sustainability or environmental issues. An interview could not be conducted as Ryanair wished not to take part in the research due to additional work pressures and a 'closed' period at the company.

For SAS, an in-person interview was conducted with Lars Resare, Head of Environment and CSR at SAS. The interview questions related to how sustainability is integrated and addressed in the airline company's business models and strategies. For the interview questions see Annex 1. The interview was recorded (with consent from the interviewee) using an iPhone and transcribed. In addition, SAS sustainability reports 2014/2015 and 2015/2106 and annual reports 2015 and 2016 were utilised to examine how sustainability has been addressed.

3.3 Research Question Three Methodology

Research question three, "What can LCC and FSC learn from each other in terms of sustainability?" acts as the discussion section for this research. This research question aims to pinpoint important aspects of the two case study airlines approaches to addressing sustainability in their business models and strategies, by focusing on the generic approaches to addressing sustainability as well as the UN Global Compact Environmental Stewardship strategy. Petrini & Pozzebon (2010) and United Nations Global Compact (2014) highlighted the areas that sustainability can be addressed within a business. This research will discuss to what extent Ryanair and SAS have addressed sustainability in these areas.

In addition, this research analyses how the two airlines differ in their approaches to sustainability, how this suits their business model and strategies, the level of efforts contributed towards sustainability and what LCC and FSC could learn from each other in regards to sustainability. A difficulty experienced for this research question is that there was not identified any available frameworks or literature on how to compare LCC and FSC sustainability approaches or how to extract relevant information for these two airline case studies. Therefore, from the extensive knowledge gained on the topic of business models, strategies, and integration of sustainability approaches Ryanair and SAS were evaluated using generic aspects. These generic aspects incorporated the three lenses sustainability can be integrated in a business, these being within strategy, operation and culture within a business. Furthermore, the research discussed Ryanair's and SAS's environmental stewardship status.

4 Findings

4.1 Background

4.1.1 Aviation Industry

The aviation industry is an interesting, dynamic and important industry. The commercial airline sector of the aviation industry is highly competitive. In 2015, an estimated 3.4 billion passengers utilised airlines for business and tourism travel (World Bank, 2016). In 2015, it was estimated that commercial airlines generated revenue of 518 billion US dollars (Statistics Portal, 2015). The aviation industry includes a number of actors; being suppliers and operators of aircrafts, manufacturers of components, fuel suppliers, airports and air navigation service providers (Ellis *et al,* 1999).

The aviation industry is not only competitive but is vitally important for today's society as air travel connects markets, facilitates international trade, is a key player in the global economy and supports the tourism industry, facilitating social growth (McManners, 2016). In 2016, it was estimated that international trade shipped via air travel was worth $5.5 trillion and tourists travelling by air are estimated to have spent $657 billion (IATA, 2016)

Air travel significantly boosts worldwide economic development as it establishes connections between cities enabling the flow of goods, people, capital, technology and ideas. The travel costs associated with air travel have over the years continuously been decreasing. Compared to twenty years ago, air travel real costs have decreased by more than half. These lower transport costs and improved connectivity have enhanced trade flows facilitating the globalisation of supply chains and investments (IATA, 2016). Without air travel, globalisation would be negatively affected (Sarker *et al,* 2013).

Businesses and society are not the only actors that gain from the aviation industry. Governments gain substantially from air travel due to the estimated generation of $118 billion from tax revenues, in 2016. In addition, the industry creates high value added jobs. As mentioned air travel facilitates international trade and tourism, which benefits governments (IATA, 2016).

As stated above, the aviation industry plays an important role in society and economies. Table 4-1 illustrates statistics that support this notion. It also highlights that the aviation industry experienced growth from 2014 to 2016, this growth is expected to continue (ATAG, 2016).

Table 4-1 Table illustrating a number of important statistics of the aviation industry between 2014 and 2016 (ATAG, 2014; ATAG, 2016).

Description	2014	2016
Jobs supported by aviation worldwide (millions)	58.1	62.7
Jobs created by airlines (flight and cabin crews, executives, ground services, check-in, training, maintenance staff) (millions)	2.2	2.7
Aviation global economic impact (including direct, indirect, induced and tourism catalytic) (trillions)	$2.4	$2.7
Percentage of global GDP supported by aviation	3.4	3.5
Passengers carried by airlines (billion)	2.97	3.3
Commercial flights worldwide (million)	37.4	32.8
Commercial airlines	1397	1402
Airports with scheduled commercial flights	3864	3883
Tonnes of carbon dioxide emitted by airlines (million)	688	739
Amount world airlines paid for fuel (billion)	$210	$226
Average aircraft occupancy	79%	80%

4.1.2 European Aviation Industry

Europe is said to be the most established region of the world with regard to air travel, especially Western Europe. This contributes to the European aviation industry being one of the most heavily regulated globally with regards to social rights, consumer protection and the environment. In 2014, the aviation industry in Europe directly generated an estimated 2.5 million jobs. These jobs were made up of 12% from jobs in airlines or handling agents, 7% of airport operators, 57% were on site in airports, 12% from jobs in aircraft manufacturing and 3% were air navigation service providers (ATAG, 2016).

Europe counted for 26.3% of the global passenger traffic in 2014, an estimated 873.4 million passengers. 7.5 million flights occurred in 2016 contributing to 1.682 billion revenue per passenger kilometre (RPK). In 2016, there are 667 commercial airports in Europe with 387 airlines. The European aviation industry had an average regional load factor of 81% (ATAG, 2016).

The European aviation industry contributed $860 billion to GDP in 2014, which is 32% of the GDP supported by the aviation industry worldwide. Europe's aviation industry is predicted to expand at a rate of 3.6% per annum on average over the next two decades (ATAG, 2016).

4.1.3 Impacts of the Aviation Industry

The aviation industry is a major contributor to environmental issues such as greenhouse gas emissions, of which the industry contributes 2 to 3% of the global CO_2 emissions. Aviation affects the lives of citizens in every country whether they fly or not. Historically, the main safety and environmental issues associated with aviation were local noise and air pollution (Ellis *et al,* 1999).

Noise pollution may not sound like a substantial impact but it has numerous negative effects associated with it. Noise pollution damages health such as hearing impairments, pain, sleep

disturbances, stress, cardiovascular effects and so on. It also degrades the quality of life, inhibits enjoyment of the outdoors, and damages wildlife. The control of noise pollution incurs substantial costs due to noise mitigation costs and noise abatement. Aircraft noise around airports and on flight paths are a major consideration for the aviation industry. Noise is measured on the decibel A scale usually expressed as dB (A). This scale is utilised by public health and environmental health officers globally (Whitelegg, 2000). In the USA, 65 dB is the threshold for the federal funding of noise mitigation. In 2000, it was estimated that over 0.5 million people in the United States lived in regions with noise levels above 65 dB and 5 million people lived in regions with noise levels above 55 dB (Waitz *et al*, 2004).

As a result of air pollution two major global environmental issues have emerged; climate change and stratospheric ozone depletion. Emissions generated by human created equipment have an effect on the global atmosphere (Ellis *et al,* 1999).

However, the aviation industry is unique when it comes to emissions as they travel several kilometres above the earth's surface. It has been determined that the effects of aircraft emissions depends strongly on the flight altitude and whether the aircraft flies in the troposphere or stratosphere. The emissions emitted by aircrafts have an effect on the climate, either directly or indirectly. Carbon dioxide and water have a direct effect. Indirect impacts of aircraft emissions include the production of ozone in the troposphere, alteration of methane lifetime, formation of contrails and modified cirrus cloudiness. Aviation fuel contributes 2-3% of the total fossil fuels used worldwide (Ellis *et al,* 1999).

4.2 Ryanair Case Study

4.2.1 Overview of Ryanair

Ryanair was the first LCC to originate in Europe after the establishment of Southwest Airlines in the United States. Ryanair has established itself as the second largest and most profitable LCC airline in Europe (Ryanair Website, 2017). Ryanair began in 1985 with daily flights between southeast Ireland and London Gatwick on a 15-seater bandeirante aircraft. Over the years, the business acquired larger aircrafts and implemented more routes and destinations. Ryanair grew from 5 000 passengers in 1985 to 90 555 521 passengers in 2014 (Ryanair Annual Report, 2015).

Today, Ryanair carries approximately 119 million passengers per annum on more than 1 800 daily flights from 85 bases. Ryanair consists of a fleet of over 360 Boeing 737 aircrafts, which connect over 200 destinations in 34 countries, operating with over 12 000 skilled aviation professionals (Ryanair Website, 2017).

To continue providing their customers with the lowest possible fares, Ryanair intends to order an additional 300 Boeing 737's. This investment aims to increase traffic to 200 million passengers per annum by 2024 (Ryanair Website, 2017). Ryanair is claims to be the most punctual airline in the LCC industry (Ryanair Annual Report, 2015) as 90% of their over 550 000 flights have arrived on time in the last 12 months (Ryanair Website, 2017).

Ryanair provides its consumers with the lowest possible fares of which, in 2016 average fares were €47 with no fuel surcharges. Ryanair is an extremely profitable business with an annual year net profit of €867 million in 2014, an increase of 66% from 2013 (Ryanair Annual Report, 2015).

4.2.2 Ryanair's Company Profile

This research aimed to review Ryanair's environmental performance to gain a richer understanding of the airlines environmental status. However, due to Ryanair's unresponsiveness to the research and secretive status on these elements, the research considered as many key environmental impact indicators and key performance indicators that were available.

Unfortunately, Ryanair does not provide a sustainability report, which would expresses valuable information on their environmental status. However, Ryanair does produce an annual report. In this annual report a section is dedicated to environmental and social aspects. This section is only seven pages long. Unlike SAS sustainability report this environmental and social section does not provide data on environmental indicators. This section focuses on the airlines progress in the areas of safety and quality, energy efficiency, environment and carbon emissions, labour management, social, ethics and transparency, and corporate governance.

This section will explore the environmental performance of Ryanair by looking at key environmental indicators. In addition, a Ryanair company profile will be constructed by looking at key performance indicators such as RPKs, ASKs, scheduled passengers, operating expenses and so on.

4.2.2.1 Key Environmental Indicators

Due to the lack of information published by Ryanair on environmental indictors, only two key environmental indicators were explored in this research. These being: carbon emissions and noise emissions. These two indicators will be unpacked further below.

4.2.2.1.1 Carbon Emissions

In Ryanair's annual report they account for the carbon emissions that Ryanair has released over the past 3 years. Table 4-2 indicates the tonnes of CO_2 per passenger released in the particular year from 2013 to 2015.

Table 4-2 Table illustrating Ryanair's tonnes of CO_2 emitted per passenger between 2013 and 2015 (Ryanair Annual Report, 2016).

Year	Tonnes of CO_2 per passenger
2013	0.094
2014	0.090
2015	0.085

As seen from this data, Ryanair has managed to reduce their carbon emissions over the years in spite of continued airline growth. This is due to improvements to their aircraft fleets and strategic sustainable decision based on fuel efficiency.

4.2.2.1.2 Noise Emissions

Ryanair does not provide statistical data on the amount of noise emissions they emit at various airports or at their home base airport in Dublin. However, Ryanair emphasises how they are striving to reduce noise emissions. Ryanair minimises their noise emissions by implementing a "one-engine taxiing" policy and by strictly complying with the Cost Index Flight Planning recommendations. By using the correct cost indices Ryanair can optimise the speed for each flight and maximise fuel efficiency (Ryanair Website, 2017). The cost index (CI) is the ratio of

the time-related cost of an airplane operation and the cost of fuel. The value of the CI reflects the relative effects of fuel cost on overall trip costs as compared to time-related direct operating costs. The airlines calculated CI is entered into the control display unit (CDU) of the flight management computer (FMC). The FMC then uses this number and other performance parameters to calculate the most economical climb, cruise and descent speeds. This economy setting helps reduce unnecessary noise emissions (Roberson, 2015).

Additional reduction in Ryanair's noise footprint has occurred due to Ryanair's investment into improved fleet technology. Their noise footprint has reduced by 86% due to the new 737-800 fleet compared to the 737-200 on a per passenger basis. The new 737-Max's will result in a further noise footprint reduction of 93% over the 737-200 fleet (Ryanair Annual Report, 2016).

The Ryanair 737-200 fleet of 126 aircrafts' noise emissions affects a 16.3 square kilometer area at the Stansted airport in the UK. The Ryanair 737-800 fleet of 189 aircrafts' noise emissions affects only 3.4 square kilometer area at the Stansted airport. The noise emissions of the 737-max-200 fleet of 197 aircrafts affect 1.7 square kilometer area at the Stansted airport (Ryanair Website, 2017). This data illustrates the major impact the different aircraft types have on noise emissions.

4.2.2.2 Key Performance Indicators

The key performance indicators, both operational indicators and financial ratios, listed in Chapter 2 will be explored for Ryanair in this findings section. Table 4-3 highlights key performance indicator data for Ryanair, which will be reviewed in more detail below.

Ryanair's break-even load factor, which is the number of revenue passenger kilometers (RPKs) where passenger revenues are equal to operating expenses divided by available seat kilometers (ASKs), were the same for 2015 and 2016. The break-even load factor is what the airline aims to achieve to break even between their operating expenses and revenue. Ryanair is achieving a much higher booked passenger load factor (the total number of seats sold as a percentage of total seat capacity on all sectors flown) compared to their break-even load factor, which indicates that the airline is making a profit (Table 4-3).

Ryanair's average booked passenger fare is the average fare paid by a fare-paying passenger, of which the airline has achieved a lower average fare in 2016 compared to 2015 for their price-sensitive customers. Ryanair incurs costs when passengers purchase tickets. This is represented by the cost per booked passenger, which is the operating expense of Ryanair divided by revenue passengers booked (number of fare-paying passengers booked). The costs incurred were higher in 2015 than in 2016 (Table 4-3).

In 2016, Ryanair paid less for the average cost per US gallon of jet fuel for their fleet than in 2015. A large potion of air ticket revenues covers the cost of fuel. Ryanair's fuel cost per seat booked was lower in 2016 than it was in 2015 (Table 4-3).

The number of airports served, number of staff, staff per aircraft, booked passenger per staff, RPKs, ASKs, and yield are performance indicators that all experienced an increase from 2015 to 2016 (Table 4-3), which shows continuous airline growth resulting in increased revenues and profits for Ryanair.

Ryanair increased their scheduled passengers from 2015 to 2016 as well as increased their fleet size to accommodate for the increased scheduled passengers (Table 4-3). During the 2016

fiscal year, Ryanair took delivery of 41 new Boeing 737-800 aircrafts, which helped their expansion into other primary airports and routes.

As mentioned in Chapter 2, RPK is the measurement of the market demand for air travel provided by the specific airline in question, where as ASK is the supply provided by the specific airline in question. For Ryanair, their ASKs are higher than their RPKs in both 2014 and 2015. This signifies that Ryanair is offering a higher capacity of seats than customers who are demanding. A higher capacity of seats available allows Ryanair to provide lower air ticket fares. The difference between ASK and RPK for Ryanair is not excessive therefore it does not negatively effect Ryanair's generation of profits. Ryanair's yield indicates that customers are paying a higher average fare paid per kilometer, per passenger from 2015 to 2016 (Table 4-3).

Table 4-3 Table illustrating data on key performance indicators for Ryanair between 2014 and 2016 (Ryanair Annual Report, 2016; Ryanair IR Website, 2017).

	Fiscal Year Ended March 31		
Data	**2016**	**2015**	**2014**
Break even load factor	72%	72%	-
Average Booked Passenger Fare (euros)	46.67	47.05	-
Cost per booked passenger (euros)	47.69	50.92	-
Average fuel cost per US Gallon (euros)	2.21	2.34	-
Fuel cost per seat (euros)	17.9	19.4	-
Revenues passengers booked (euros)	106 431 130	90 555 521	-
Booked passenger load factor	93%	88%	-
Average sector length (miles)	762	776	-
Number of airports served at period end	200	189	-
Average daily flight hour utilization (hour)	9.36	9.03	-
Staff at period end	11 458	9 394	-
Staff per aircraft	34	31	-
Booked passengers per staff	9 289	9 640	-
Scheduled passengers	106 400 000	9 060 000	-
Year end fleet	341	308	-
RPKs	-	113 184	103 752
ASKs	-	128 245	125 391
Yield	-	3.76	3.65

Ryanair experienced a 79.9% increase in profit after taxation from 2015 to 2016 (Table 4-4) due to a 15.6% increase in revenues, as a consequence of a 17.5% increase in traffic for the airline, a 11.5% fuel savings per passenger and a once-off profit on the sale of the airlines 29.8% shareholding in Aer Lingus (Ryanair Annual Report, 2016).

Ryanair's scheduled passenger revenue increased by 16.6% from 2015 to 2016 (Table 4-4) as a result of a 17.7% increase in the number of passengers booked from 90.6 million to 106.4 million indicating increased passenger volumes as well as reflected by the booked passenger load factors increased from 88% in 2015 to 93% in 2016 (Table 4-3) (Ryanair Annual Report, 2016).

Ryanair's ancillary revenues, which consist of non-flight scheduled operations (including excess baggage charges, administration/credit card fees, sales of rail and bus tickets, priority boarding, reserved seating, accommodation, travel insurance and car rental), in-flight sales and Internet related services, experienced a 12.5% increase from 2015 to 2016 (Table 4-4). Non-flight scheduled operation revenues increased by 14.2% from 2015 to 2016 (Table 4-5). Revenues from in-flight sales increased by 19.8% from 2015 to 2016 (Table 4-5). Revenues from internet-related services experienced a 15.4% decrease from 2015 to 2016 (Table 4-5) (Ryanair Annual Report, 2016).

Table 4-4 Table illustrating data on key financial highlights (euros) for Ryanair between 2015 and 2016 (Ryanair Annual Report, 2016).

	Fiscal Year Ended March 31	
Components of ancillary revenues	**2016**	**2015**
Non-flight scheduled	1 329 600 000	1 164 400 000
In-flight sales	153 400 000	128 100 000
Internet-related	85 600 000	101 200 000

Table 4-5 Table illustrating the components of Ryanair's ancillary revenues (euros) in 2015 and 2016 (Ryanair Annual Report, 2016)

	Fiscal Year Ended March 31	
Financial Highlights	**2016**	**2015**
Profit after taxation	1 559 100 000	866 700 000
Scheduled revenues	4 967 200 000	4 260 300 000
Ancillary revenues	1 568 60 000	1 393 70 000
Operating expenses	5 075 70 000	4 611 100 000

The total operating expenses of Ryanair increased by 10.1% between 2015 and 2016 (Table 4-4). This as a result of increased costs incurred by the airline associated with the growth of the airline. The total operating cost per passenger decreased by 6.3% as the fuel costs per passenger decreased by 11.5% and ex-fuel costs decreased by 2.4% (Ryanair Annual Report, 2016).

Fuel and oil costs include the direct cost of fuel, the cost of delivering fuel to the aircraft, aircraft de-icing and EU emissions trading costs. Ryanair experience an 11.5% decrease in fuel and oil costs per passenger, while in absolute terms the costs increased by 4.0% between 2015 and 2016 (Table 4-6). This was a consequence of a 10.9% increase in hours flown and a higher load factor. The average price paid for fuel by Ryanair decreased by 5.6% from €2.34 per U.S. gallon in 2015 to €2.21 per U.S. gallon in the 2016 (Table 4-3) (Ryanair Annual Report, 2016).

In absolute terms, Ryanair's airport and handling charges increased by 16.5% between 2015 and 2016 as a consequence of adding primary airports to the airlines network configuration. Per passenger Ryanair's airport and handling charges decreased by 0.9% (Table 4-6) (Ryanair Annual Report, 2016).

In absolute terms, Ryanair's route charges increased by 13.8% between 2015 and 2016 as a result of increased regions flown to and from and increased Eurocontrol prices in France, Germany and the UK. Per passenger Ryanair's route charges decreased by 3.2% (Table 2-3) (Ryanair Annual Report, 2016).

Ryanair's staff costs consist of salaries, wages and benefits increased in absolute terms by 16.4% between 2015 and 2016. Staff costs decreased by 1.0% on a per-passenger basis (Table 3-6) (Ryanair Annual Report, 2016).

In absolute terms Ryanair's depreciation increased by 13.1% between 2015 and 2016 as a consequence of the purchase of 41 additional aircraft, the purchase of three spare engines and increased levels of maintenance. Ryanair's depreciation per passenger decreased by 3.7% (Table 4-6) (Ryanair Annual Report, 2016).

In absolute terms, Ryanair's marketing, distribution and other expenses increased 25.1% between 2015 and 2016 and on a per passenger basis they increased by 6.5% (Table 4-6). These expenses faced an increase due to increased distribution costs related to higher on-board sales, disruption costs due to strikes, terrorist attacks and higher passenger compensation costs (Ryanair Annual Report, 2016).

Ryanair's maintenance, materials and repair expenses primarily consist of costs for routine maintenance provisions for leased aircrafts and overhaul of spare parts. In absolute terms, these costs decreased by 3.4% and per passenger basis by 17.8% (Table 4-6). This was a result of lower unscheduled maintenance in 2015 and lower maintenance provisions due to lease hand backs in winter of 2016 (Ryanair Annual Report, 2016).

Ryanair experienced an increase of 5.3% in aircraft rental expenses between 2015 and 2016 as a consequence of longer summer leases, offset by the lease hand backs in the winter of 2016 (Table 4-6) (Ryanair Annual Report, 2016).

Table 4-6 Table illustrating the components of Ryanair's operating expenses (euros) in 2015 and 2016 (Ryanair Annual Report, 2016).

	Fiscal Year Ended March 31	
Components of operating expenses	**2016**	**2015**
Fuel and oil	2 071 400 000	1 992 100 000
Airport and handling charges	830 600 000	712 800 000
Route charges	622 900 000	547 400 000
Staff costs	58 540 000	50 290 000
Depreciation	427 300 000	377 700 000
Marketing, distribution and other	292 700 000	233 900 000
Maintenance, materials and repairs	130 300 000	134 90 000
Aircraft rentals	115 100 000	109 400 000

4.2.3 Ryanair's Business Model

Ryanair operates a low cost business model. The four building blocks of a business model are value proposition, value architecture, revenue model, and culture and values (Casadesus-Masanell & Ricart, 2012). These building blocks describe the business model of a business, which is how value is created for customers and profit is derived. This was described in the literature review.

The value proposition is what value Ryanair creates and for whom they create this value (Casadesus-Masanell & Ricart, 2012). For Ryanair this is the lowest possible fare, which is the core of their business model. This business model targets consumers who do not mind compromising on comfort and are fare conscious. Ryanair manages to offer the lowest possible fares by maintaining focus on cost containment and cuts and maximises their ancillary revenue (Ryanair Website, 2017).

The building block, value architecture, is how Ryanair creates this value for their customers. Ryanair creates value for customers by utilising secondary airports to reduce congestion times, have lower charges and Ryanair has stronger bargaining power with these airports. They create value by operating short haul, point-to-point routes and maintaining monopolies on most of the routes they operate (Ryanair Website, 2017). Ryanair is able to maintain their low cost fares by operating a single type of aircraft, purchasing aircraft in bulk and ensuring they have a young aircraft fleet. In addition, they maximise their aircraft usage (Ryanair Website, 2017). Ryanair cuts costumer service costs by making use of Internet booking facilities via their website, which is how they create value for the customers and the business (Casadesus-Masanell & Ricart, 2012).

The building block, the business revenue model, is how the business earns money. Ryanair makes money through 58% core revenues, which is the price of the ticket purchased by the consumer. 22% from ancillary revenues, which is baggage costs, airport services such as boarding pass printing, in-flight purchases and so on, and 20% are from subsides from the airports (Casadesus-Masanell & Ricart, 2012).

The last building block of a business model, culture and values, is what values does the business pursue and communicate (Casadesus-Masanell & Ricart, 2012). Ryanair

communicates that their values are focused on providing the lowest possible fare for their customers by cutting the frills out of air travel (Ryanair Website, 2017).

As described in the literature review, a business model canvas is a tool used to visualise the business model (MaRS, 2012). Figure 4-1 highlights a business model canvas for Ryanair low cost business model. All the aspects help facilitate the value creation of the business. This being the lowest possible fares provided to customers. This illustration helps summarise Ryanair's business model into a format that is easily legible. As seen by the business model canvas Ryanair's business model is very simple.

Ryanair has focused on deconstructing the airline value creation process to minimise costs and maximise revenue, which has resulted in continuous innovation at the business model level. This innovation by Ryanair's has created a competitive advantage over the traditional European low cost carriers resulting in rapid profitable growth (MaRS, 2012).

<table>
<tr>
<td rowspan="2">Key Partners

- No connections with other airlines
- In house operations
- Local airports
- Car rentals
- Hotels and hostels
- Bus companies</td>
<td>Key Activities

- Short haul flights
- Limited passenger services
- Standardised fleet of Boeing 737
- Network management
- Airport/destination relationships
- Web-sales/site management
- Training,
- Maintenance</td>
<td rowspan="2">Value Proposition

- Easy to travel
- Point-to-point routes
- Simple purchase and flight plans
- Frequent reliable departures
- Very low ticket prices
- Refundable ticketless flight
- Cheap</td>
<td>Customer relationships

- Internet payments
- Popular deals
- Friendly service
- Self-service
- Email
- Ancillary services: hotel, car rental, credit card</td>
<td rowspan="2">Customer Segments

- Frequent point to point flyers
- Self-directed, cost conscious travellers that manage without the frills</td>
</tr>
<tr>
<td>Key Resources

- Multi-skilled personnel
- Company spirit
- Website
- Boeing 737 fleet</td>
<td>Channels

- Website: ryanair.com
- Selective use of travel agents</td>
</tr>
<tr>
<td colspan="3">Cost Structure

- Airplanes
- Fuel
- Non-unionised staff
- Website</td>
<td colspan="2">Revenue Streams

- Fares
- Inflight services
- Baggage handling fees
- Online ads</td>
</tr>
</table>

Figure 4-1 Ryanair business model canvas (MaRS, 2012).

4.2.4 Ryanair's Business Strategy

The literature review (Chapter 2) discusses in detail what a business strategy is and the varying types of strategies available for businesses to implement. In this case, Ryanair implements a Porter's low cost leadership strategy (Sørensen, 2005). Ryanair's long-term aim is to achieve the lowest possible fares for the customers in the market. The implementation of this strategy includes the construction of efficient facilities, strong pursuit of cost reductions, avoidance of marginal customers accounts and cost minimisation in service, sales, marketing and so on as mentioned in Chapter 2 (Sørensen, 2005).

Ryanair has implemented efficient facilities to achieve their cost leadership strategy, which has reduced costs through operational efficiency. Ryanair focuses on quick turnaround times to achieve their low cost leadership strategy. Ryanair aims to turn around an aircraft quickly, which means from the time the aircraft arrives at the gate, disembarks passengers and baggage and then embarks a new set of passengers and baggage, in 25 minutes or less. To achieve this time scale, Ryanair does not make use of air bridges, which helps reduce their costs, also the cabin crew does a quick clean of the aircraft and thorough cleaning occurs only at night after the aircrafts routes have been completed. Low turnaround times results in increased efficiency in aircraft utilisation, which generates more revenue for the business. Ryanair has continued to increase their aircraft utilisation over the years (Sørensen, 2005).

Ryanair's strategy to utilise regional and secondary airports fuels their efficiency as these airports have less congestion, have closer proximity to gates and terminals ensuring easier embarking and disembarking and faster baggage claim. Ryanair has a dominate position within these airports, which aids their cost leadership strategy, as they have a stronger negotiating position with the airports to access preferable slot allocations to suit the needs of their cost leadership strategy and customer demands such as ease and speed when travelling (Sørensen, 2005).

To achieve their cost leadership strategy, Ryanair has also reduced their costs of sales and marketing by promoting their website and using this portal as the only source of sales (Sørensen, 2005). Ryanair offers customer low service level, which facilitates the achievement of their low cost leadership strategy, such as no in-flight food and entertainment is provided for free but for an additional cost (Sørensen, 2005).

Another strategy implemented by Ryanair to ensure a cost leadership strategy is the use of a homogenous aircraft fleet, Boeing 737 model. This saves costs in pilot and airhostess training and maintenance. In addition, Ryanair has a higher seat density on their aircrafts, as the seats are smaller than the ones in the aircrafts utilised by full service carriers. The seat pitch of the Ryanair seats is 28 inches where as economy seats in a full service carrier are usually 32 inches. Therefore, there are more seats on Ryanair's aircrafts, which means maximum capacity of each flight (Sørensen, 2005).

A major contribution to Ryanair's low cost leadership strategy is the choice of airports they operate out of. Ryanair tends to not operate out of primary airports but focuses on secondary and regional airports. The reasons being that these airports experience less congestion, which effects time and money of the airline and helps the airline, achieve their turnaround time goals (Sørensen, 2005).

Furthermore, an aspect of Ryanair's low cost leadership strategy is their distribution system. The airline does not make use of travel agents and only distributes tickets via the Internet or the call centre and they do not utilise paper tickets. This all reduces the distribution costs, which facilitates them being the leaders in low cost strategy (Sørensen, 2005).

4.2.5 How Ryanair Addresses Sustainability

In today's economy, many businesses are focusing more attention towards sustainability and its integration into the business units and business practices. It is important to understand that the addressing of sustainability into a business is not the analysis of how "sustainable" the business model and strategy is but what mechanisms, tools, and initiatives are implemented by the business to improve their sustainability and environmental performance as well progress towards sustainable development.

Ryanair's growth is said to be achieved in the most environmentally friendly and sustainable way (Ryanair Website, 2017). This was a result of the airline investing in the latest aircraft and engine technologies, which burn less fuel and reduced CO_2 emissions by 45% over the past ten years, and Ryanair implements operational and commercial decisions that facilitate further minimisation of environmental impacts. In 2006, Ryanair stated that they are "industry leaders in terms of environmental efficiency and are constantly working towards further improving their environmental performance" (ELFAA, 2006).

This section shall present the findings on how Ryanair has addressed sustainability in their business model and strategy. The findings investigate how Ryanair has addressed sustainability in generic terms through the three lenses mentioned in Chapter 2, these being: strategic integration, operational integration and cultural integration. These lenses cover leadership, institutional mechanisms, stakeholder pressures and so on. Moreover, the findings review the addressing of sustainability by Ryanair through the perspective of the UN Environmental Stewardship Strategy framework.

4.2.5.1 Strategic Integration

4.2.5.1.1 Technological Advancements

Ryanair has invested billions of euros into improving their aircraft fleet to ensure improved fuel efficiency. Ryanair has minimised and continues to decrease their fuel consumption and CO_2 emissions per passenger kilometer through a combination of measures. These measures include the use of the latest aircraft and engine technologies such as winglets, maximisation of passenger per flight to spread the fuel consumption and CO_2 emissions over the greatest amount of passengers thus efficient seat configuration and high load factors (ELFAA, 2006).

Ryanair's investment into a new aircraft fleet reduced their overall fuel consumption and emissions by 55% between 1998 and 2007. In 2006, Ryanair's fuel burnt per 100 revenue passenger kilometers was 3.5 liters (Figure 4) and was projected to decrease further with the continuous fuel saving measures implemented in the future. The fleet wide installation of winglets reduced the fuel burnt and CO_2 emissions by 4% in 2006 (ELFAA, 2006). Ryanair is focusing on sustainability with regard to their technology decisions. In the future, they aim to have a fleet comprising of a mixture of Boeing 737-800 and 737-Max-200 aircrafts. 737-Max-200 is the newest generation of Boeing 737 aircrafts, which have more seats than the older Boeing 737 aircraft. These aircrafts will only start delivery in the fiscal year of 2019. The engine of the Boeing 737-Max-200 combined with the advanced technology winglets and other aerodynamic improvements will decrease fuel consumption by up to 18% on a per seat basis compared to the current Boeing 737 configuration and in addition will reduce operational noise emissions by 40% (Ryanair Annual Report, 2016).

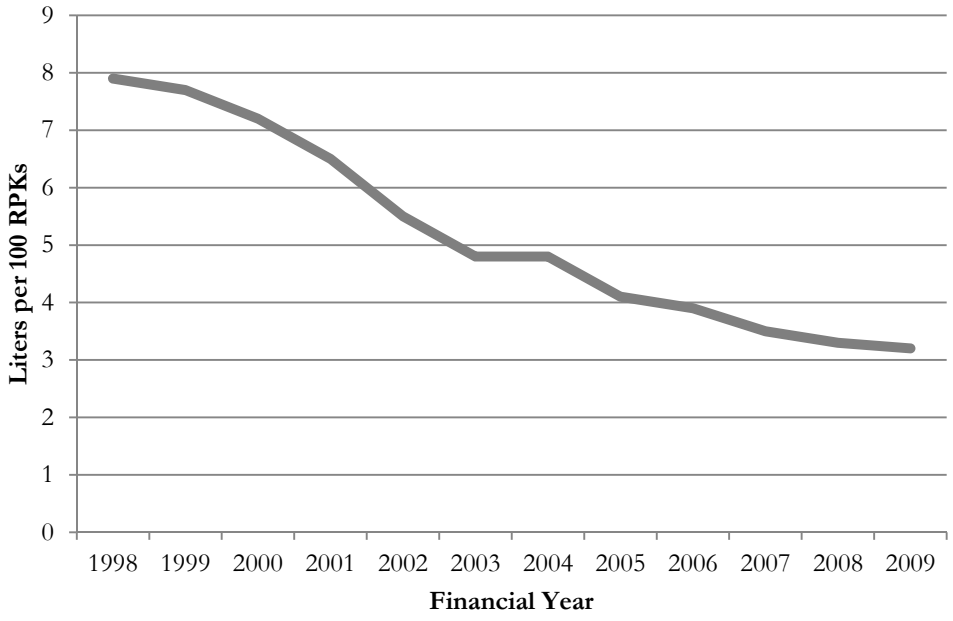

Figure 4-2 Fuel burnt per revenue per kilometer (RPK) by Ryanair (ELFAA, 2006).

4.2.5.1.2 Ancillary Services

Ryanair's 'no frills' approach addresses sustainability in their business model and strategy greatly, by reducing the amount of waste they produce. Ryanair does not include "free" meals, drinks or entertainment such as newspapers to passengers in flight, which results in a substantial reduction in the amount of waste produced. Therefore contributing to sustainability (ELFAA, 2006).

Ryanair's boarding pass strategy not only reduces the costs incurred by the airline but is also is more sustainable. An estimated 76 million individuals were printing their own boarding passes in 2011. Ryanair encourages customers to download their boarding passes on their cell phones to reduce the usage and waste of paper (Jureviciute *et al,* 2013).

4.2.5.1.3 Route Network and Airport Utilisation

Another way sustainability is being addressed in the business model and strategy of Ryanair is the use of secondary airports and point-to-point services, which help to increase fuel efficiency and limit emissions. Ryanair achieves higher levels of sustainability as they avoid long taxiing times and holding patterns at congested primary airports and deliver passengers to their specific destinations on only one flight. The implementation of point-to-point routes by Ryanair results in customers having to take less connecting flights via congested main hub airports, which is more sustainable due to less take offs and landings (ELFAA, 2006).

However, there are downsides to this strategy. Secondary airports are generally further away from central areas and customer's departure and destination locations, which result in additional utilisation of other transport modes. Point-to-point services provided by Ryanair does not mean that customers are not utilising other airlines to reach further destinations that Ryanair does not connect with. Therefore, these circumstances effect how much Ryanair's strategy is contributing to sustainability.

4.2.5.2 Cultural Integration

4.2.5.2.1 Reporting and Communication

Ryanair dedicates a small section of their annual report to social and environmental aspects. However, this section is not substantial by any means. The report touches on the investments they have and other plans with their fleet, the operational and commercial aspects they implement such as the density of seats on their aircrafts, the minimising of late night departures to reduce the impact of noise emissions, the installation of winglets, the implications of their direct services and so on. The report also touches on regulations applied to the businesses facilities, Ryanair's policy on noise and emissions and the emissions trading scheme (Ryanair Annual Report, 2016).

The social aspect of the report focuses on how the business is providing a fair and equal work space with regards to nationality, race, gender, martial status, disability, age and religious or political beliefs (Ryanair Annual Report, 2016). In addition, Ryanair has little to no efforts directed towards corporate social responsibilities (CSR). Ryanair does not construct or publish a sustainability report and from reviewing the available literature, there is little to no mention of sustainability being communicated throughout the business.

4.2.5.2.2 Leadership and Stakeholder Pressure

Ryanair's leadership shows no desire to push sustainability forward as one of their main concerns. This is highlighted by their lack of referral to the concept of sustainability and the inadequacy of the sustainability reporting produced by the airline. In addition, the messages received by Ryanair's CEO Michael O'Leary with regard to the environment and environmentalists a story of uninterest towards to sustainability. Michael O'Leary has made it clear through public announcements that the businesses main focus is on low cost airfare only. For example, Michael O'Leary is quoted, as "we want to annoy the fuckers whenever we can. The best thing you can do with environmentalists is shoot them. These headbangers want to make air travel the preserve of the rich. They are luddites marching us back to the 18th century. If preserving the environment means stopping poor people flying so the rich can fly, then screw it" (Michael O'Leary, 2015). His opinion on environmentalists highlights that sustainability is not one of his concerns, which negatively effects the businesses integration of sustainability as leaders opinions and values filter through the core business values.

Instead of sustainability, Ryanair's main focus is providing low fares and their "always getting better" initiative, which has no sustainability leaning but rather focuses on improving the experience for customers such as improved website and additional services such as hotels and holiday packages. Furthermore, there is no stakeholder pressure to address sustainability by the airline, as the stakeholders primary concerns are revenues and profits, which mean emphasis on how to provide the lowest fares to customers (Ryanair Annual Report, 2016).

4.2.5.3 Ryanair Environmental Stewardship

As described in Chapter 2, environmental stewardship is the comprehensive understanding and effective management of critical environmental risk and opportunities related to climate change, emissions, waste management, resource consumption, water conservation, biodiversity protection and ecosystem services. In other words, how environmental conscious a company is (United Nations Global Compact, 2014).

The best practices that are utilised to ensure the integration of corporate sustainability and achieve a suitable level of environmental stewardship were mentioned in the literature review. These include: "management systems, technology assessment, life cycle assessment/costing,

water foot printing, risk and impact assessment, performance targets/indicators, cleaner and safe production, consumption and responsible use targets, 3R (reduce, reuse and recycle), employee training and awareness, supply chain arrangements, monitor and evaluate performance, report emission, public discourse of policies and practices and mutli-stakeholder dialogue" (United Nations Global Compact, 2014).

The incorporation of corporate sustainability achieves environmental stewardship for a company. The four universal approaches to implementing corporate sustainability and achieving environmental stewardship in relation to Ryanair will be evaluated and discussed.

First, is the embedment of environmental consciousness into all aspects of the business by leaders (United Nations Global Impact, 2014). Ryanair does not follow this approach at all. However, environmental benefits do occur due to their low cost business model and strategy. Ryanair promotes throughout the company to be as efficient as possible (Ryanair Annual Report, 2016). A by-product of this approach facilitates sustainability as efficiency results in the use of fewer resources and produces less waste. Ryanair also focuses on providing a service at the least cost, which ensures simplicity thus sustainability.

Second, is the balance between short-term targets and long-term targets (United Nations Global Compact, 2014). Ryanair succeeds in this approach as they focus on the short-term goals of providing the lowest possible fares with suitable punctuality and aiming for a certain load factor above the break-even load factor, at the same time as focusing on long-term strategies of fleet improvements and fuel efficiency (Ryanair Annual Report, 2016).

Third, is the diffusion of the best practices (mentioned in Chapter 2) in Ryanair's value chain and business networks by collaborating and engaging with stakeholders (United Nations Global Compact, 2014). Ryanair does not require their suppliers or themselves to follow these best practices. They follow best practices if they facilitate their aim of achieving the lowest possible operating expenses thus the lowest fares for customers (Ryanair Annual Report, 2016). Therefore, Ryanair is not diffusing best practices throughout the company and when engaging with stakeholders and fall short in this area.

Fourth, is the translation of best practices throughout the business (United Nations Global Compact, 2014). Ryanair does not have a strong sustainability focus in all or any areas of their business model. The strategy is a low cost strategy, which only focuses on business practices and strategies that ensure the lowest possible fares and does not address sustainability and best practices (Ryanair Annual Report, 2016).

4.3 SAS Case Study

4.3.1 Overview of SAS

Scandinavian Airline (SAS) has gained the title of the leading airline in Scandinavia (SAS, 2017). SAS was founded in August 1946 through the partnership between Det Danske Luftfartselskab A/S (DDL), Det Norske Luftfartselskap A/S (DNL) and Svensk Interkontinetal Lufttrafik AB (SILA), Danish parent company, Swedish parent company and Norwegian parent company respectively (SAS Website, 2017). SAS was formed to manage the inter-continental air traffic of these Scandinavian countries. SAS aims to connect smaller regional Scandinavian airports with larger hubs (SAS Website, 2017).

In 1950, SAS operated the first commercial flight to cross the North Pole. In 2014/2015, 28.1 million passengers travelled with SAS to 119 destinations in Europe, the US and Asia. SAS operates with Star Alliance, which provides consumers with more than 18 500 daily departures to 1330 destinations in 192 countries across the world (SAS Website, 2017).

SAS operates a diverse aircraft fleet consisting of A340-300, A330-300, A319, A320, A321, B737-600/700/800, Bombardier CRJ900, ATR-72 and SAAB 2000 (SAS Annual Report 2015/2016, 2016). SAS utilised 126 different aircraft during 2015/2016, of which 16 were long-haul aircrafts and 110 were short-haul flights. The average age of the aircraft fleet was 12.9 years at the years end. In 2015/2106, SAS introduced three new aircrafts and phased out three old aircrafts. SAS owns the majority of their aircraft fleet. However, they wet leased 37 different aircrafts on a long-term basis during 2015/2016 (SAS Website, 2017). Wet lease refers to the letting or hiring of an aircraft with the crew, maintenance and insurance, which is paid for by the hour (Luftrecht Online, 2001). One was a long-haul aircraft, 20 regional jets and 26 turboprops. These aircrafts operate under SK flight numbers. SAS also wet leased a number of aircrafts on a short-term basis (SAS Annual Report 2015/2016, 2016). SAS comprises of a fleet of aircrafts of different sizes and range to cater for the varied passenger volumes and distances required by business and leisure travellers (SAS, 2017).

SAS does not only focus on passenger transport but cargo transport as well. The SAS Cargo Group A/S (SCG) provides freight services of over 1000 daily flights to, from, via and within Scandinavia. In collaboration with other carriers, SAS airfreight capacity services most continents. SAS outsources the ground handling of freight and mail (SAS Annual Report 2015/2016, 2016).

4.3.2 SAS's Company Profile

4.3.2.1 Key Environmental Indicators

In 2015/2016, SAS's flight operations utilised 1 309 000 tonnes of jet fuel, which corresponds to 4 122 000 tonnes of carbon dioxide emissions and 17 800 tonnes of nitrogen oxide emissions. The 2015/2016 period saw a 300 000 tonnes of carbon dioxide emission increase and 1 500 tonnes of nitrogen oxide emission increase from 2014/2015 (SAS Sustainability Report 2014/2015, 2015).

SAS's total emissions from all aircraft operations increased 8% from 2014/2015 to 2015/2016, while the production of emissions in tonne kilometers increased by 10%. This growth mainly occurred on long-haul flights (SAS Sustainability Report 2015/2016, 2016). Table 4-7 illustrates all the key environmental indicators measured and monitored by SAS.

Table 4-7 Table illustrating the key environmental indicators for SAS (SAS Sustainability Report 2015/2016, 2016).

Key Environmental Indicator	Unit	2015/2016	2014/2016
Flight operation aspects			
CO_2 total	1000 tonnes	4 122	3822
CO_2 passenger share	1000 tonnes	3 746	3492
NO_x	1000 tonnes	17.8	16.3
Passenger kilometers	Million	37 771	34 613
Tonne kilometer	Million	4 496	4084
CO_2/passenger kilometer	Grams	99.2	100.9
CO_2/tonne kilometer	Grams	926.8	935.7
Aircraft noise at take-off	85 dB area in km^2 per departure	2.06	1.97
Ground handling			
Glycol consumption (de-icing fluid)	1000 liters	1 493	1 490
CO_2 vehicle petrol	Tonnes	57	65
CO_2 vehicle diesel	Tonnes	4132	4 564
Fuel spills	Instances	0	4
Maintenance problems			
CO_2 vehicle petrol	Tonnes	39	38
CO_2 vehicle diesel	Tonnes	200	208
Fuel spills	Instances	0	0
Energy, waste and water			
Energy	GWh	110	116
As of electricity	GWh	49	51
As of heating	GWh	61	65
Unsorted waste	Tonnes	247	164
Hazardous waste	Tonnes	162	127
Water	1000 m^3	69	52

4.3.2.2 Key Performance Indicators

SAS transported a total of 29 million passengers in 2015/2016, which is approximately 32% of total traffic in the home market (Nordic regions). SAS revenue, passengers and flights make it the largest airline in the Nordic region. The main bases are Copenhagen Kastrup airport, Oslo Gardermoen and Stockholm Arlanda. The SAS Cargo Group A/S (SCG) provides freight services of over 1000 daily flights to, from, via and within Scandinavia. In collaboration with other carriers, SAS airfreight capacity service to all continents (SAS Annual Report 2015/2016, 2016).

SAS is achieving a relatively constant load factor between 2014 and 2016 (Table 4-8). SAS experienced an increase in passengers between 2014/2105 and 2015/2016, which highlights

growth for the airline. SAS's ASKs are much higher than their RPKs. This means that SAS is providing a larger capacity that is being demanded by customers. SAS has decreased their staff size between 2014/2015 and 2015/2016, which facilitates revenue generation in conjunction with the increase in passenger numbers (Table 4-8).

Table 4-8 Table illustrating key performance indicators for SAS (SAS Annual Report 2015/2016, 2016).

	Fiscal Year Ended March 31	
Data	**2016/2105**	**2014/2015**
Total traffic (for scheduled and charter traffic)		
Booked passenger load factor	76%	76.3%
Distribution/number of passengers	29 009 000	28 094 000
RPKs (euros)	382 736 932	349 996 036
ASKs (euros)	503 753 915	458 869 877
Only scheduled traffic		
Yield	0.91	0.98
Year end fleet	146	-
Staff at period end	10 710	11 288
Airports served	119	-

4.3.3 SAS's Business Model

Business model is the design of the value creation, delivery and capture mechanisms employed by a business (Teece, 2010). Therefore, what the business does to create value for customers and gain benefits and profits. The business model describes the architecture of the revenues, costs and profits. The four building blocks of a business model are value proposition, value architecture, revenue model, and culture and values (Casadesus-Masanell & Ricart, 2012). Business models were described in detail in Chapter 2.

The value proposition for SAS is what value they create and for whom they create this value. For SAS, the benefit it creates for its customers is the offering of many destinations and departures, providing access to the Star Alliance programme, punctuality, safety, care, easy travel and providing services for both business and leisure travellers. SAS establishes this benefit by providing competitive pricing against other FSC airlines, by continually adding more destinations to their routes, operating out of primary airports, providing luxury services at main hub airports such as lounges, and collaboration with Star Alliance so that customers get full access to the network Star Alliance provides (SAS Website, 2017).

SAS defines their business model as a "traditional business model focusing on those that travel more than 5 times a year" (Lars Resare, 2017). SAS business model is structured around "frequent flyers" (Lars Resare, 2017). The primary customers for SAS have been business travellers in Scandinavia whom value easier and more time-efficient travel. The core strength of the SAS business model is that they offer more destinations and departures than any other Nordic airline.

Due to increased productivity and more efficient processes, SAS is capable of continually investing in more destinations and thereby satisfying the demands from its frequent

customers. A by-product of SAS increasing the number of destinations with more departures and competitive pricing has engaged a proportion of leisure travellers as well. SAS has "realise(d) so we have been working for a couple of years to not only focus on business travel but rather on those who do travel often for business but also travel for leisure purposes" (Lars Resare, 2017). Therefore, SAS is expanding its customer group.

SAS is trying to "focus on both" business and leisure travellers of which "is a challenge because their (leisure and business travellers) prerequisite are so different" (Lars Resare, 2017). For example, leisure travellers require "a lot of Mediterranean routes doing the summer and business travellers require short haul routes throughout the Scandinavian region connecting to other destinations and continue throughout the business year" (Lars Resare, 2017). Overall, SAS business model strives to both leisure and business travellers with customised service and convenience as well as striving for safety, punctuality and care (SAS Website, 2016).

SAS value architecture is how SAS creates this value for their customers. SAS creates value for its customers by operating primary airports that connect customers to numerous destinations. SAS aims to operate many departures to fulfill customer's desires. SAS is a member of Star Alliance, which broadens the destinations they have access to ensuring convenience and opportunities for customers. SAS operates both long-haul and short-haul flights, which cater for varying needs and desires. SAS provides luxury services to their frequent flyers such as lounges and inclusive food and drink. SAS has a dynamic aircraft fleet, which enables them to provide the appropriate service to customers, which creates value for the customers and business (SAS Annual Report 2015/2016, 2016).

Business revenue model is how the business generates revenues. SAS generates revenue from customers by pricing their service at a price that covers all operating costs as well as providing a satisfactory service that results in full aircrafts thus a high demand for the supply. SAS also generates revenue by establishing good deals with suppliers and outsourcing when more profitable (SAS Annual Report 2015/2016, 2016).

SAS fare structure is designed to accommodate all customer groups. The fare structure is divided into three segments. These being: SAS Go, SAS Plus and SAS Plus Full Flex. Each segment varies in the changes that you can make to your purchase, the refund policy of the ticket purchase, and the amount of baggage allowed (SAS Annual Report 2015/2016, 2016). These segments have been developed to target more price sensitive customers as well as business travellers.

SAS business model generates revenue from three different factors, these being passengers, freight and excess baggage. SAS generates revenue through passengers from the purchasing of tickets at higher costs than that of a low cost carrier airline. This makes up the bulk of their core revenue. SAS generates a small proportion of revenues from ancillary services such as excess baggage charges. SAS is unlike Ryanair who generate large revenues from ancillary services such as boarding pass printing and meals on board aircrafts. A major generator of revenue for SAS is their cargo group (SAS Annual Report 2015/2016, 2016). This section is not the main focus of the research therefore details of this business function will not be discussed in detail.

The last building block of a business model is culture and value, which is the value that the business pursues and communicates. SAS aims to provide easier air travel to their frequent flyers within the Nordic region. Therefore, they communicate their punctuality, reliability, safety and their care. SAS communicates that they aim to make customers life easier and that

SAS customers are "part of a community experiencing easy, joyful and reliable services delivered the Scandinavian way" (SAS Website, 2017).

Figure 4-3 illustrates the business model canvas for SAS and highlights the aspects, which help facilitate SAS to create value for the customers and the business. This illustration helps summarise SAS business model for ease of understanding and knowledge acquisition.

Key Partners	*Key Activities*	*Value Proposition*	*Customer relationships*	*Customer Segments*
- Frequent flyers - Star Alliance network - Outsourcing supply chain/wet lease companies - Primary airports - Joint ventures – car hires, hotels, other airlines	- Cargo group - Long haul flights - Short haul flights - Scandinavian countries - Extended Europe - Complex aircraft fleet - Wet lease agreements - Training and employee awareness - Maintenance - Hub airport relationships - Maintenance - Hub airport	- Many destinations & departures - Flexibility - Availability - Safety - Punctuality - Care - Make travel easier - Reliability - Value for money	- Professional - Self service and assisted - Friendly helpful service	- Business travellers - Leisure travellers - Frequent flyers
	Key Resources - Multi skilled personnel - Catering company - Aircraft fleet - Fuel suppliers - Company values and vision		*Channels* - Website - Social media - Advertising - Collaborations /partnerships - Travel Agencies - Ticket counters - Company call centre	

Cost Structure	*Revenue Streams*
- Aircraft - Wet lease agreements - Fuel - Catering - Rent at airports - Website - Star alliance membership	- Advertising based - Loyalty programme - Varying ticket fare structure: SAS Go, SAS Plus, SAS Plus Full

Figure 4-3 Business Model Canvas for SAS (SAS Website, 2017; Lars Resare, 2017).

It is natural that businesses will face benefits and negatives with their business model. SAS highlights that their main negative with this business model is that they have to "try adapt the size of the aircraft in order to meet demand" (Lars Resare 2017). For example, if SAS has "40 passengers who want to go in the morning and 150 who wish to travel in the afternoon, it means that SAS has to have different types of equipment" (Lars Resare 2017). Unlike "low cost carriers who have only one type of equipment and find the market based on what they can produce" (Lars Resare, 2017).

SAS tries to produce what the market needs, which drives complexity in the business model. SAS needs different types of aircrafts, different types of educations for those who operate the aircraft. SAS experiences the challenges of coping with varying types of aircraft, as each different aircraft increases the complexity requiring more knowledge, more administration, more spare parts and so on, which all drives costs up (Lars Resare, 2017).

However, a major benefit of this business model utilised by SAS is that "the customers like what they are getting" (Lars Resare, 2017). SAS believes from their own measurements that they "are a popular product, of which there is demand for it" (Lars Resare, 2017). SAS sees a benefit in that they can actually deliver a product that can supply the market and society with transport that they need rather than the customers having to adapt to what the producer can produce (Lars Resare, 2017). However, SAS is aware that this business model incurs additional costs.

4.3.4 SAS's Business Strategy

SAS utilises a product differentiation strategy. As defined in Chapter 2, a product differentiation strategy is a strategy where businesses attempt to gain competitive advantage by increasing the perceived value of their products or services relative to the perceived value of other business products or services (Barney and Hesterly, 2012). This strategy as defined by Porter reduces the cross-price elasticity by weakening the perception that competing products are actual substitutes (Kee, 2015).

SAS implements this strategy by providing innovative product design, developing strong brand image and nurturing their loyal customer base (Lars Resare, 2017). SAS operates a hub-and-spoke network and is a member of Star Alliance, which provides customers with a variety of choices in departures and destinations. SAS's range of premium and economy classes, aircraft fleet, cabin configuration and airline fare structure facilitates SAS to implement their product differentiation strategy, which sets them apart from other FSC airlines in Europe (SAS Website, 2017).

To implement a successful product differentiation strategy SAS focuses on delivering positive and differentiated experiences to all customers through customer employee contact and services offered by the airline. For example, SAS is aware that consumers may prefer to utilise an app for their boarding passes rather than having to print them out (Lars Resare, 2017). Therefore, SAS has established a user-friendly app to satisfy customers' desires and enhance their experience when travelling with SAS (Lars Resare, 2017). SAS product differentiation strategy ensures that SAS is particularly active on their social media and websites to ensure that complaints and enquires get the necessary attention, which sets them apart from other airlines (SAS Website, 2017; Lars Resare, 2017).

SAS product differentiation strategy is structured to focus on those customers that travel frequently and aims to meet their expectations thus making SAS product attractive to them (Lars Resare, 2017). A core component of SAS strategy is time. SAS integrates the importance of "time" throughout all their strategic work. SAS aims to develop a "strategic product where

travellers use as little time as possible with us" (Lars Resare, 2017). The utilisation of time is very important to SAS and their customers and they therefore aim to ensure shortest time spent at airports, implement fast tracking, lounges, and to have all services as digitalised as possible. Therefore, the air travel process should be as fast as possible. Time matters to SAS and is one of their key strategic points (Lars Resare, 2017).

SAS's business strategy ensures that customers' needs are "respected in a modern way" (Lars Resare, 2017). Therefore, SAS is trying to "fulfill the needs of customers with the least amount of disruption in the daily life of their travellers" (Lars Resare, 2017). SAS's strategy ensures that they are "seamless but not invisible and make air travel as easy as possible" (Lars Resare, 2017).

Additionally, an important key component of their strategy is safety; which is generally overlooked, as it is a prerequisite for an airline. However, SAS invests numerous resources to uphold the highest standard of safety for their customers without jeopardising efficiency of the travelling process (Lars Resare, 2017).

Furthermore, SAS has integrated sustainability as a major strategic focus as they are "aware that our customers want us to focus on sustainability" (Lars Resare, 2017). SAS customers are "conscious about their impact on the sustainability aspect of their behaviour and their part in society" (Lars Resare, 2017).

Other aspects of SAS's strategy, which helps differentiate them from competitors and satisfy customers desires, is their focus on technology, in true Scandinavian design and the airlines focus of taking care of employees. These components of the strategy encourage customers to utilise SAS product (Lars Resare, 2017).

4.3.5 How SAS Addresses Sustainability

As mentioned in Chapter 2, there are numerous definitions of sustainability. This research has focused on corporate sustainability. However, the research wished to determine whether the case study airline has a particular sustainability definition of which they follow in their day-to-day business functions. SAS was asked how they interpret the concept of sustainability. SAS highlighted that they have defined sustainability in their own "sustainability agenda that (SAS) works with. This covers the environment, social and financial responsibilities" (Lars Resare, 2017).

SAS perceives sustainability as being the act of taking responsibility for their actions. SAS takes responsibility for all the different aspects of their operations and have materiality going into the airline operation aspects, which have the most impacts, while still being profitable. Therefore, SAS defines sustainability as the act of being responsible while turning a profit (Lars Resare, 2017).

SAS's definition of sustainability covers many aspects such as their promise of safety and punctuality, decent prices, paying taxes, collective agreements with all employees, engaging with the working environment and upholding a healthy environment for customers. However, the main focus of their sustainability definition is the importance of reducing their climate impact, this including reduction in greenhouse gasses and noise emissions. SAS aims to drive their sustainability responsibilities harder especially because the norm of Scandinavia drives high ambitions in this regard and SAS have a legacy to uphold (Lars Resare, 2017).

4.3.5.1 Strategic Integration

SAS's strategic approach to addressing sustainability is integration. SAS "tries to integrate (sustainability) as much as possible in all decision and development points that (SAS) have in our processes and procedures" (Lars Resare, 2017). SAS ensures that their approach to sustainability is not an "add on" approach. When SAS purchases, produces or sources any product they have "a set of prerequisites that (SAS) should fill, with documentation and values we need to address" (Lars Resare, 2017).

SAS prefers the integration of sustainability into initiatives than implementing sustainability projects, as they believe that "projects take focus away from the actual work, as projects are more focused on managing the activity than on the actual implementation" (Lars Resare, 2017).

4.3.5.2 Operational Integration

4.3.5.2.1 Environmental Programmes

SAS has constructed environmental programmes, which facilitate the implementation of strategies into practice by conducting activities outlined by environmental programmes within their environmental management system, which is certified according to ISO 14001. SAS uses these environmental programmes as platforms to address sustainability (SAS Sustainability Report 2015/2016, 2016).

These environmental programmes focus on different areas within the business including: fleet renewal, more efficient planning of SAS aircrafts, more efficient usage of SAS aircraft in day-to-day operations, continuous aerodynamic, weight and efficiency follow-up and modification of SAS aircraft, environmentally adapted products, alternative sustainable jet fuels and stakeholder dialogues with air traffic management, airports, aircraft and engine manufacturers (SAS Sustainability Report 2015/2016, 2016).

The environmental programmes aim to reduce greenhouse gas emissions, as this is SAS main sustainability focus because it is the airlines largest impact. In the following section the mentioned environmental programme areas will be discussed and how they address sustainability (SAS Sustainability Report 2015/2016, 2016).

4.3.5.2.1.1 Fleet Renewal Environmental Programme

An important aspect of sustaining a good level of sustainability in an airline is to focus on the aircraft fleet. To improve and maintain their sustainability the aircraft fleet needs to be kept up to date with the best technology as newer aircraft result in reduced emissions and fuel consumption. SAS continually replaces older aircraft with newer aircrafts. In the 2015/2016 period, SAS introduced three new aircraft at the same time as phasing out three older Boeing 737-600s (SAS Sustainability Report 2015/2016, 2016).

SAS not only focuses on new aircraft within aircraft purchases but they strive to ensure they wet lease the best possible aircraft. In 2015/2016, SAS long-term wet lease operator introduced eleven brand new aircraft (SAS Sustainability Report 2015/2016, 2016).

The introduction of these new aircraft resulted in less fuel consumption, less noise emissions and improved facilities on the aircraft for consumer benefits. For example, the introduction of the A350 will reduce fuel consumption by an estimated 35% per seat and generate 50% less noise compared to an A340. The introduction of these new aircrafts is in accordance with SAS fleet renewal strategy for the future years (SAS Sustainability Report 2015/2016, 2016).

In addition to fleet renewal, SAS is working extensively with their employees to develop positive employee behaviour. SAS has approximately 80 different on-going initiatives ensuring that all aircraft operation processes, such as the load and off loading of the aircraft or maintenance of the aircraft have positive employee behaviour that ensures maximum efficiency and conducted in a sustainable manner. This strategic approach focuses on the aircraft and behavioural issues and refers to activities, such as in-flight services including food, beverages and waste handling. The main focus is on the actual product and what kind of behaviour employees exhibits when they utilise the product, how they treat the product and how much it is needed. SAS is "basically a very big catering firm who serves food to 27 million people every year" (Lars Resare, 2017).

4.3.5.2.1.2 More Efficient Planning of SAS Aircraft Environmental Programme

SAS business model and strategy requires the airline to operate aircraft of varying sizes and performances. The SAS fleet ranges from 70 to 264 seats, which are capable of flying routes where the aircraft is airborne for between 20 minutes to more than 11 hours. SAS aims to create flying conditions that are the most profitable and energy-efficient as possible depending on demand, time of day and route (SAS Sustainability Report 2015/2016, 2016).

SAS considers sustainability in this area by ensuring they utilise the most appropriate sized aircraft. Flying aircraft that are too big for the demand and route result in the generation of unnecessary emissions. SAS has purchased a range of aircrafts that differ slightly in the number of seats, which provides the airline with the flexibility to cater to the demand and therefore reduce the total emissions at any given time. This is a major contribution to sustainability (SAS Sustainability Report 2015/2016, 2016).

4.3.5.2.1.3 More Efficient Usage of SAS Aircraft in Day-to-Day Operations Environmental Programme

SAS highlights the importance of long-term fuel saving by having created an extensive long-term fuel saving programme, which is integrated into all their operations. The main focus of this programme is to ensure that all employees of SAS's airline operations have the requirements and knowledge to be fuel-efficient. All employee groups that impact fuel consumption need to be involved in this programme. The key functions of this programme include those functions responsible for all planning and procedures as well as thousands of SAS employees who conduct flight operations (SAS Sustainability Report 2015/2016, 2016).

The primary focus of a number of activities occurring in these programmes are established operation conditions such as procedures and how they are implemented and whether the available system support is sufficiently optimised for improved fuel efficiency. This environmental programme is also linked to the employee behavioural initiatives mentioned above (SAS Sustainability Report 2015/2016, 2016).

4.3.5.2.1.4 Continuous Aerodynamic, Weight and Efficiency Follow-Up and Modification of SAS Aircraft Environmental Programme

SAS is aware that today's businesses function focus is in a short-term economy, but a long-term life cycle perspective is needed to ensure sustainability of the environment and of the businesses future (Lars Resare, 2017). This perspective has resulted in SAS focusing on continuous long-term technological improvements of their aircraft fleet, which indicates reductions in environmental impacts and a more sustainable approach. SAS keeps up-to-date on aircraft technology improvements by continuously modifying their aircraft to have better technology, improved aerodynamics and reduce weight (SAS Sustainability Report 2015/2016, 2016).

For example, SAS is installing winglets on Boeing 737NGs or sharklets on Airbus A320s to improve aerodynamics. The installation of winglets is profitable from a sustainability perspective. In addition, examples of how SAS achieve weight reductions include the replacement of composite brakes and installing lightweight seats. For example, the replacement of older seats results in approximately the saving of two kilos per seat (SAS Sustainability Report 2015/2016, 2016).

SAS also focuses on the upgrading of their aircraft engines with an on-going engine up-grade programme. This programme results in the engines being upgraded to newer versions. More than half of the fleet engines on the Boeing 737, delivered prior to 2006, have been upgraded which has resulted in more fuel-efficient aircraft (SAS Sustainability Report 2015/2016, 2016).

SAS is constantly trying to reduce the weight of all materials and products utilised by SAS service offerings. For example, SAS optimises the amount of water filled in tanks for toilet use, replaces carts with lighter versions, replaces glass bottles with plastic alternatives and optimises the amount of products served and utilised based on analysis of historical actual demand (SAS Sustainability Report 2015/2016, 2016).

The topic of water tank utilisation on SAS aircrafts illustrates how in-depth SAS has integrated sustainability thoroughly into their business strategies. SAS has complex water manuals that they require suppliers to utilise when providing them with water, of which SAS constantly monitors that these manuals are being followed (Lars Resare, 2017). These manuals have addressed sustainability by calculating how much of the water in the aircraft tank is required for a certain distance flight. For a domestic flight SAS requires a quarter of a tank. By only filling the tank up to a quarter SAS can save lifting up to 180kg, which reduces fuel consumption and minimises emissions emitted. This approach can save up to 40 kg of fuel on flights (Lars Resare, 2017). These actions highlight that sustainability is a major focus for SAS and they are addressing it in a number of ways.

4.3.5.2.1.5 Environmentally Adapted Products Environmental Programme

SAS addresses sustainability in their business by focusing on environmentally adapted products. This entails everything from locally produced and/or organic foods to using less materials and producing less waste that needs to be sorted, for all ground processes, in the lounge and on board SAS aircrafts (SAS Sustainability Report 2015/2016, 2016).

Organic products and offerings are a major focus for SAS. Today, organic breakfasts are supplied on all SAS flights as well as a number of items in SAS airport lounges (SAS Sustainability Report 2015/2016, 2016). In this regard, SAS cater for their aircraft and lounges based on statistical data of how much food is consumed by customers. This involves the analysis of historical flights to determine the demand for certain meals and beverages (Lars Resare, 2017). In addition, SAS aims to move towards a more electronic based communication system, which will entail using less paper and using 'green IT' (SAS Sustainability Report, 2015/2016 2016).

SAS understands the importance of sorting and waste disposal on-board their flights. This aspect poses a challenge for SAS, as there is limited space on-board the aircraft. In addition, there are issues regarding the disposal of waste at certain airports due to different national legislation. Despite these challenges SAS is putting substantial effort into their waste handling (SAS Sustainability Report 2015/2016, 2016). For example, aluminium cans from most domestic flights are being recycled with efforts to initiate further recycling. SAS monitors the quantities of waste produced to determine for future recommendations on quantities (Lars

Resare, 2017). These efforts implemented by SAS highlight their strong efforts to address sustainability.

4.3.5.2.1.6 Alternative Sustainable Jet Fuels Environmental Programme

SAS considers sustainable jet fuels to be a major factor contributing towards how they are addressing sustainability. SAS has been working together with other stakeholders to fast track the development and commercialisation of more sustainable jet fuels, specifically in their local region (Lars Resare, 2017; SAS Sustainability Report 2015/2016, 2016).

In the case of airlines, bio fuel is produced from various raw materials such as forest and food waste. Bio fuel is a drop-in fuel that can be blended with fossil fuels and does not require changes to the aircraft. The maximum limit of bio fuel mixed is now 50% (SAS Sustainability Report 2015/2016, 2016).

SAS focuses on bio fuels in three areas. One is regular deliver. SAS has been accepting delivers of bio fuel on a regular basis at Oslo Airport. This falls under the first commercial contract of its kind of which SAS is the only Scandinavian airline participating. The fuel is supplied by AirBP and distributed via the regular fuel distribution system. Second, is stakeholder engagement. SAS is active in various working groups on the topic of bio fuels. For example, the Nordic Initiative for Sustainable Aviation (NISA), Fly Green Fund and Sustainable Aviation Fuel User Group (SAFUG). Third, is the possibility to upgrade to renewable fuels. This means that SAS is exploring the possibility of offering its customers the ability to upgrade from fossil fuels to renewable fuels (SAS Sustainability Report 2015/2016, 2016).

SAS is striving above their competitors in this matter and thereby addressing sustainability. The future looks positive for SAS, in terms of bio fuels and transitioning to renewable fuels. The main challenge presently is the high price of bio fuels (Lars Resare, 2017).

4.3.5.2.1.7 Stakeholder Dialogue/Work with Air Traffic Management, Airports, Aircraft and Engine Manufacturers Environmental Programme

SAS is aware that there are many external factors and actors that influence the sustainability of their airline. Therefore, SAS is actively involved in working with responsible parties for air traffic control and airports in Sweden, Norway and Denmark. They are working together to identify more efficient methods for controlling air traffic in the airspace and on the ground in these countries (SAS Sustainability Report 2015/2016, 2016).

Examples of these efficient methods include the Continuous Descent Approach from Top of Descent. The Continuous Descent Approach from Top of Descent is "when the air traffic control allows the aircraft to approach in a continuous gliding descent without using unnecessary engine power" (SAS Sustainability Report 2015/2016, 2016). This method is common in small airports but uncommon in larger airports. Another example is SAS's involvement in the establishment of more advanced solutions using satellite-based Required Navigation Performance (RNP AR) rather than the traditional ground-based ILS (SAS Sustainability Report 2015/2016, 2016).

In addition, to these activities undertaken by SAS, SAS maintains dialogues and discussion with relevant aircraft and engine manufacturers, as well as, producers of interiors and other installations in the aircraft. The maintaining and opening of these dialogues ensures SAS is aware of the decisions that are made by external actors, which may affect their business and their sustainability status (SAS Sustainability Report 2015/2016, 2016).

4.3.5.3 Cultural Integration

4.3.5.3.1 Communication and Reporting

SAS is commitment to sustainability. This is emphasized by the dedication of a whole department, Department of Environment and CSR, within the business, which oversees all sustainability and environmental related processes and initiatives as well as the creation of SAS's in depth sustainability reports that are produced every fiscal year. SAS sustainability reports follow GRI standards, which ensure that they are of top standards (SAS Website, 2017).

SAS has an environmental vision, which states that they "intend to be a part of the future long-term sustainable society and support IATA's vision of flying without greenhouse gas emissions by around 2050" (SAS Sustainability Report 2015/2016, 2016). To achieve this vision SAS has created sustainable development strategies as well as environmental programmes, which act as a platform to address sustainability.

SAS's sustainable development strategies aim to "create a culture among its employees based on strategic decisions and a commitment to environmental work, use documented sustainability appraisals as a basis for all decisions, engage in strategic sustainability communication with relevant stakeholders, and promote tomorrow's solutions through alliances and proactive demands for better sustainability performance from our suppliers and stakeholders" (SAS Sustainability Report 2015/2016, 2016).

SAS has constructed a number of environmental goals that illustrate that SAS aims to reduce relative CO_2 flight emissions by 20% in 2020 compared with 2010, to reduce noise on take offs by 15% by 2020 compared with 2010 and regularly use JET-A1 based on renewable sources (SAS Sustainability Report 2015/2016, 2016). SAS goals that were attained in 2015/2016 included a reduction in its relative CO_2 emissions per passenger kilometer by 9.6% in 2015/2016 compared to 2010, reduction in noise on take off by 14.2% in 2015/2016 compared with 2010 and SAS used approximately 90 tonnes of synthetic jet fuel (SAS Sustainability Report 2015/2016, 2016).

4.3.5.4 SAS Environmental Stewardship

As mentioned in Chapter 2, there are four key pillars that businesses should implement to achieve environmental stewardship. The following four pillars and how SAS has addressed these pillars will be unpacked below.

First, is the embedment of environmental consciousness into all aspects of the business by leaders. SAS's sustainability approach is one of integration. They strongly believe that sustainability efforts should be integrated into all aspects of the business (Lars Resare, 2017). As a result SAS has embedded environmental consciousness throughout the entire airline.

SAS CEO, Rickard Gustafson, highlights this point in their 2016 Sustainability Report. SAS "believes that well-structured sustainability efforts create value for our customers and further differentiate SAS" (SAS Sustainability Report 2015/2016, 2016). In addition, SAS environmental management system strengthens their embedment of environmental consciousness. Their environmental management system is based on shared environmental and sustainability policies, the Code of Conduct, the UN Global Compact, airline operational standards and ISO 14001. This system "provides guidelines for a continuing cycle of planning, implementation and evaluation, as well as the improvement of processes and activities to meet operational and environmental targets" (SAS Sustainability Report 2015/2016, 2016). This system ensures that sustainability filters into all aspects of the business and is monitored

constantly.

Second, is the balance between short-term targets and long-term targets. SAS's short-term targets include providing customers with satisfactory experiences with the airline and delivering them frequent and easy to utilise transport (Lars Resare, 2017). At the same time, SAS is focusing on long-term targets of continuous growth and reducing their impacts (SAS Sustainability Report 2015/2016, 2016). Therefore, SAS has set up a number of strategies and goals to achieve within a certain time period. SAS has succeeded in achieving a balance in their targets facilitating their environmental stewardship status.

Third, is the diffusion of the best practices (mentioned in Chapter 2) throughout SAS's value chain and business networks by collaborating and engaging stakeholders. SAS diffuses best practices such as consumption and responsible use targets of resources throughout all the airlines operations, employee training and awareness, risk and impact assessments, key performance indicators and many more (SAS Sustainability Report 2015/2016, 2016).

In addition, SAS engages with all stakeholders and suppliers to integrate their sustainability approach. In most cases stakeholders are unaware of the extent of their sustainability focus as it is integrated extensively into their manuals that are supplied to stakeholders and suppliers (Lars Resare, 2017). SAS also makes stakeholder decisions based on their level of sustainability consciousness. Therefore, SAS is succeeding in diffusing sustainability efforts throughout their value chain. This is highlighted by SAS's CEO, Rickard Gustafson, who said in SAS sustainability report 2016 that SAS is "convinced that financially sustainable operations require social and environmental responsibility, and that work on sustainability issues contributes to value creation and competitiveness in a variety of ways" (SAS Sustainability Report 2015/2016, 2016).

Fourth, is the translation of best practices and processes throughout the business and within the geographical regions in which the business operates. As mentioned above, SAS environmental management system ensures that best practices and processes are translated throughout the business, which establishes a good level of environmental stewardship for SAS. SAS ensures that their manuals for certain activities are carried out with the same efficiency and attention to detail wherever they operate (SAS Sustainability Report 2015/2016, 2016; Lars Resare, 2017).

5 Discussion and Analysis

The following discussion and analysis aims to answer the third research question posed by the research. This being: "What can LCC and FSC learn from each other in terms of sustainability?". This section will analyse the environmental performance and key performance indicators for both Ryanair and SAS. Furthermore, this research will evaluate the findings of how Ryanair and SAS have addressed sustainability through the three lenses: strategy, operations and culture, and in specific manner focusing on environmental stewardship.

5.1 Environmental Performance and Key Performance Indicators Discussion and Analysis

5.1.1 Environmental Performance

Ryanair does not publish extensive information on the OECD key environmental indicators that relate to the aviation industry like SAS does. Ryanair only reports on their carbon emissions and noise emissions. Ryanair has managed to decrease its per passenger CO_2 emissions emitted as each year passes (Table 4-2). This is due to improvements on the aircraft fleet and strategic sustainable decisions with regard to fuel efficiency. In addition, Ryanair has managed to reduce their noise footprint drastically via the improvement of the aircraft fleet.

Ryanair should strive to improve their reporting on key environmental indicators. Consequently, on the ones that they do collect data for, their strategic approach is improving their environmental performance with regard to these indicators.

SAS is extremely transparent and informative when it comes to reporting on sustainability and key environmental indicators. This also improves the airline's awareness of its impacts and pinpoints areas on which it wishes to improve. It also sets a benchmark for competing airlines. Unlike Ryanair, SAS is experiencing an increase in CO_2 and NO_x emissions emitted as the years pass (Table 4-7). SAS sustainability report provides illuminating statistics on a number of environmental indicators such as amounts of energy utilised, quantities of sorted and unsorted waste, quantities of water utilised and so on (Table 4-7).

A comparison between Ryanair and SAS environmental performance cannot be conducted in this research as valuable statistics and data are not available. In addition to the explanation (in Chapter 1, Section 1.2) that Ryanair and SAS are providing such differing products that a comparison is not appropriate between these two airline carrier types. Therefore, the research highlights, separately, the environmental performance of Ryanair and SAS to provide a deeper understanding into the make up and environmental impacts of the airlines.

5.1.2 Key Performance Indicators

The research analysed Ryanair and SAS key performance indicators. The research looked at both operational variables and financial ratios to provide a deeper understanding into the two airline company profiles.

Ryanair functions with an estimated 11 458 staff at the end of fiscal 2016 year whereas SAS employs 10 710 staff. Ryanair's scheduled passengers were 106 400 000 in 2016 with a year-end fleet of 341. SAS's scheduled passengers were 29 009 000 in 2016 with a year-end fleet of 126 (Table 4-3 & 4-8). SAS transports a much smaller number of customers with a smaller dynamic aircraft fleet. Therefore, in general SAS appears as a smaller airline than Ryanair.

RPKs and ASKs are dramatically higher for SAS than for Ryanair in 2016. This indicating that SAS provides more seats due to their dynamic aircraft fleet. In addition, SAS generates more revenue per passenger kilometer than Ryanair do due to their varying airfare structure unlike Ryanair's low cost fares. However, both SAS and Ryanair have higher ASKs than RPKs illustrating that both airlines are providing a higher supply of its product than is being demanded by the customers. This is inevitable as it is near impossible for an airline to achieve the same RPK and ASK figures. This results in less revenue for the airlines thus less profits and possibly higher prices. The airlines should aim to efficiently maximise utilisation of all aircrafts on all routes. Ryanair achieves higher load factors than SAS, indicating that the utilisation of their aircrafts is much higher (Table 4-3 & 4-8).

From the break down of Ryanair's ancillary revenues it clearly shows the large role these ancillary services play in generating revenue for the business. Non-flight schedule operations account for the largest revenue gains out of all the ancillary revenues for Ryanair (Table 4-4 & 4-5). These operations include baggage charges, credit card fees and so on. SAS does not generate as much revenue from their ancillary services as they include these services within the airfare.

It is foreseen in the findings that in general Ryanair is achieving decreased costs for customers, which is standing true to their business model. In absolute terms, Ryanair is faced with increases in operating expenses, which is natural for a growing business. However, Ryanair is still managing to provide customers with low cost fares. Ryanair has achieved a much higher booked passenger load factor than their break-even load factor (Table 4-3). This facilitates Ryanair access to available capital to invest in certain additional ventures such as aircraft renewal. SAS has a much lower load factor than Ryanair as SAS's business model and strategy enables lower utilisation of aircrafts due to higher airfare purchased by customers unlike Ryanair's low cost strategy, which requires the airline to maximise utilisation to generate acceptable profits.

Ryanair and SAS revenues are vastly different (Table 4-3 & 4-9). However, Ryanair is seeing an increase in revenues year from year whereas SAS did not increase their revenue from 2015 to 2016, despite both airlines facing continued growth.

The research aimed to provide a richer understanding into both airlines company profiles. A true comparison could not be undertaken as these airlines vary dramatically in their make up and product offerings. However, a brief comparison was conducted to add context to the indicators. The information provided in this section hopes to provide a substantial basis for the rest of the research and to enrich the ability to understand the research case studies.

5.2 Discussion of How Sustainability is Addressed by Ryanair and SAS

The research proposed to evaluate how Ryanair, an LCC, and SAS, an FSC, addresses sustainability in their business models and business strategies. These findings show that Ryanair's business model and business strategy focus on low cost. This strategy is not only advantageous for customers but for the environment on a per passenger basis. A by-product of the strategy is sustainability, as many of the strategies implemented by Ryanair facilitate sustainability without intentional actions from Ryanair. By focusing on a low cost leadership strategy and low cost business model, Ryanair aims to utilise and waste as little resources as possible as this incurs cost for the airline. However, due to the advantages provided to customers by Ryanair such as easy access to cheap air travel results in continuous growth for the airline. An outcome is increased fuel consumption and CO_2 emissions, which in the long term is not sustainable.

SAS operates a traditional business model that focuses on Scandinavian frequent flyers, predominantly business travelers and a product differentiation strategy, which sets SAS apart from competitors. For SAS, sustainability is a major aspect of importance for the airline therefore; they integrate sustainability into all areas of the business. For SAS, the main sustainability issue to address, from a stakeholder perspective, is greenhouse gas emissions. This is because it has the largest impact on the environment and the majority of operations conducted by the airline impact on greenhouse gas emissions.

Furthermore, SAS focuses on sustainability areas such as work environment, work conditions, competition laws, bribery, human rights and so on but their main effort is focused towards greenhouse emissions, their priority. By improving sustainability in all major and minor procedures conducted by SAS they facilitate the reduction of greenhouse gas emissions.

As mentioned in Chapter 2, there are three lenses in a business where sustainability can be addressed as well as a more specific approach, environmental stewardship. How both Ryanair and SAS have addressed sustainability in these areas will be discussed in further detail below.

5.2.1 Strategic Integration

5.2.1.1 Technological Advancement and Fleet Renewal

Ryanair's main business function is air travel at the lowest possible fares. To achieve this strategy, the type of aircrafts utilised is vitally important and has an enormous influence on sustainability. Ryanair makes conscious efforts to ensure they own the most up-to-date aircrafts and utilise the most advanced technology available. This has a huge impact on their fuel consumption and CO_2 emissions, which strengthens Ryanair's sustainability focus. SAS also invests large amounts of capital into the renewal of their aircraft fleet and constantly install the latest technology on their aircraft.

Ryanair's and SAS's approaches to fleet renewal and technology advancements ensure that these two airlines are continually decreasing their environmental impact by the reduction in greenhouse gas emissions, noise emissions and fuel consumption. Technological advancements and fleet renewal is the one area that both Ryanair and SAS are addressing sustainability equally. A main driver for this focus for Ryanair is that improvements reduce fuel consumption, which reduces operating expenses, hence increased revenues generated. The same goes for SAS, but another driver for SAS is their major focus on integrating sustainability into all aspects of the business.

5.2.2 Operational Integration

SAS is succeeding in addressing sustainability in the operational lenses. This is due to their extensive efforts to construct environmental programmes that cover all business functions. SAS has developed seven main environmental programmes covering a range of operational activities of the airline. The main aim of the environmental programmes is to reduce greenhouse gas emissions and integrate sustainability. In general, these environmental programmes are comprehensive, effective and efficient. These environmental programmes cover everything from employee behaviour to encourage efficiency and fuel savings, environmentally adapted products such as organic products, waste handling, improved utilisation of aircrafts, fleet renewal and stakeholder dialogues and projects.

An interesting environmental programme, which will have increasing influence in the future that SAS is engaging in, is the interest in sustainable jet fuels such as biofuels. The highlights that SAS is aware that improved aircraft technologies is not enough to reach their

environmental goals and need to proceed with the next step being biofuels. SAS engages in this industry as much as is feasible for the business.

Ryanair places minimal to no effort into addressing sustainability in their operations. Ryanair has no environmental programmes to improve operational activities within the airline. It is recommended that Ryanair utilise resources to construct environmental programmes to ensure that sustainability is being addressed in their operational activities. These environmental programmes may increase cost reductions facilitating their low cost business model and strategy.

5.2.3 Cultural Integration

5.2.3.1 Communication and Reporting

SAS is very transparent in all their business functions and, in particular, in sustainability. SAS publishes in-depth annual reports and sustainability reports. SAS's sustainability reports are of good standard due to their efforts to follow GRI standards. SAS efforts to create and focus on environmental goals, visions and strategies highlight their desire to address sustainability. By defining these goals and visions, SAS can achieve success with regard to sustainability, as they are aware of what they wish to achieve and how to go about achieving this which is well thought out and executed.

In addition, SAS environmental goals are based on a long-term perspective, which illustrates that sustainability is seen as a key sustainable factor for their future survival and success. Furthermore, SAS leadership is highly outspoken about their efforts to address sustainability and expressing the importance of sustainability to their business. This is highlighted in their annual and sustainability reports.

As discussed previously, Ryanair only dedicates a small section to sustainability in their annual report. Ryanair does not communicate their efforts of addressing sustainability in their business, their sustainability initiatives or how they enhance their environmental performance. In addition, it is not within Ryanair's business strategy to compile a sustainability report or an annual review of their sustainability status or environmental performance. Ryanair also does not implement an environmental management system and does not get audited on an annual basis.

With regard to corporate social responsibility (CSR) Ryanair is not excelling. Ryanair has a bad reputation with regards to CSR as they are ranked in the bottom 10 out of 581 companies in an ethical ranking (Essays UK, 2013). This rating is established on parameters such as environmental performance of the airline, CSR of the airline and information provided by consumers. This ranking was complied by Geneva-based Covalence. The ranking measures qualitative data on 45 criteria, which include waste management policies, labour standards, and social utility and human right policies. The reason Ryanair is ranked so low relates to issues regarding misleading information and green claims on their website as well as issues with social responsibility. Ryanair's low cost strategy results in harsh cuts in services, which may be seen as a downfall with regard to their social responsibility towards consumers (Essays UK 2013). This is the complete opposite to SAS whose CSR efforts are acceptable due to their GRI standards.

It is recommended that Ryanair improve their sustainability reporting approach, as their section within their annual report is weak and not substantial enough. Ryanair should follow GRI standards to achieve a suitable report. This will ensure Ryanair creates sustainability vision, goals and strategies. The establishment of these aspects will focus Ryanair's

sustainability efforts resulting in positive sustainability rewards for the business. Ryanair's leadership needs to become more invested in the concept of sustainability and thereby be more transparent on the connection between the airline and sustainability. Ryanair should evaluate and investigate how competing airlines have integrated sustainability such as SAS.

With regards to communication and reporting, SAS is upholding an acceptable standard of which they are proud. Ryanair is not expressing a similar standard as SAS in reporting and communication. This is an area that Ryanair should aim to improve. These improvements should require minimal efforts from the airline that has vast capital at its disposal.

5.2.3.2 Stakeholder Pressure and Leadership

Ryanair and SAS are vastly different in the areas of addressing sustainability in stakeholder pressures. Ryanair's stakeholders have little to no interest in sustainability and do not push it as a driving force in their business functions. This is because Ryanair's main focus is generating the lowest possible airfares, not the sustainability of their operations. However, Ryanair is managing to achieve their goals and strategies without the integration of sustainability; therefore the incentives are too low to put effort into addressing sustainability. This does not boded well for sustainability.

This is not the case for SAS as stakeholders place large emphasis on sustainability in all aspects of the business. Sustainability is one of their main focuses thus the pressure from stakeholders never ceases. SAS product differentiation strategy requires the integration of sustainability to ensure the future survival of the strategy.

SAS leadership filters their ambitions for sustainability throughout all employees and functions of the business. The CEO of SAS is extremely open and engaged with regards to the topic of sustainability in all annual reports, sustainability reports and in the media. Customers are well aware of SAS's commitment to sustainability. Ryanair falls short in this area, as the leadership is publically open about their lack of interest in sustainability in conjunction with their lack of reporting and communication throughout the business. Ryanair's initiatives focus on cost cutting operations to achieve lower airfares for customers.

For sustainability to be taken seriously and strongly integrated into all business functions, Ryanair's leadership first needs to adapt their values, beliefs and opinion about sustainability. This will encourage the acceptance of sustainability throughout the business and employees as well as with customers.

5.2.4 Environmental Stewardship

In terms of SAS's environmental stewardship status, they are proving to be highly successful as SAS has utilised and integrated all four of the key pillars into their business model and strategy, which results in the achievement of environmental stewardship. SAS environmental vision, goals and strategies work in conjunction with their core values and business function, which ensures that in the future SAS will maintain their environmental stewardship status. SAS aims to continuously improve their environmental stewardship by constantly improving their sustainability initiatives and keeping open the communication between the business functions and the environmental department.

Ryanair's environmental stewardship status is on a weak standing. Ryanair fails to embed environmental consciousness in the company due to lack of commit from leadership and lack of communication and training on sustainability for employees. Ryanair fails to diffuse best practices throughout their value chain and business networks. Therefore, Ryanair places little emphasis on initiatives such as waste reduction, recycling, life cycle assessment and so on.

Ryanair succeeds in the activity of balancing of short-term and long-term targets, as Ryanair is aware that they need to think in both the long-term and short-term to sustain their continuous growth. This effectively improves their sustainability status. However, Ryanair falls short in too many areas for this one aspect to improve their environmental stewardship.

A major aspect that facilitates SAS's environmental stewardship is their environmental management system and sustainability reporting. It is recommended that Ryanair should invest efforts towards establishing an environmental department to handle all environmental and social aspects and implement an environmental management system. The benefits gained from this establishment will focus and direct Ryanair's sustainability efforts in an efficient and effective manner as well as provide expertise on the concept with relation to the business functions, models and strategies. This department would manage the creation of sustainability reports and the activities that come with this task. An environmental management system will provide Ryanair with a deeper knowledge on their activities impacts and which areas they should be focusing to improve. An environmental management system results in high levels of sustainability integration.

5.2.5 Sustainability Integration Approach Versus Sustainability as a By-Product

Ryanair does not address sustainability in many of their business functions. However, at a first glance it does not seem that sustainability is not being achieved because of this in some aspects. It was noticed that sustainability could be a by-product of Ryanair's low cost leadership strategy and low cost business model.

Ryanair's no frill approach facilitates sustainability in a way, as Ryanair's aims to utilise and waste as little resources as possible. Ryanair reduces the amount of waste produced by not providing "free" food and drinks to customers, minimising their time spent on the ground at airports, aircrafts parking closer to the terminals so fewer equipment is utilised on the airport, and encouraging customers to use technology for boarding passes and other services.

However, Ryanair's low cost strategy results in other factors that are not facilitating sustainability. Therefore, Ryanair's strategy is experiencing the rebound effect. For example, lower fares results in air travel being more accessible to customers, therefore increasing the number of passengers utilising Ryanair. Increased passengers means increased fuel consumption, increased greenhouse gas emissions, increased waste produced and increased usage of water. Additionally, Ryanair utilises secondary airports, these airports are usually situated a hefty distance from city centres. Therefore, an outcome is customers have to travel further to reach these airports, which reduces the sustainability of their travels. As well as, due to Ryanair's strategy to not provide "free" beverages and foods in-flight may encourage customers to purchase these items at airports, of which their sustainability focus is unclear (not in the scope of the research) but decreases the control the airline has over consumption of customers.

Another aspect to consider is the increase in travel periods and increase in customer segments. Ryanair's low cost strategy has opened the door of air travel to many more customers segments over the years. This allows customers to travel for leisure considerable more amounts than they could in the past. Leisure travel includes other factors that may not contribute to sustainability such as consumption of food, water, accommodation, and transportation in foreign countries. Therefore, sustainability may be a by-product of Ryanair's low cost strategy within the airlines business model and strategies but it may decrease sustainability levels in other circumstances.

SAS's strategic approach to sustainability is to integrate sustainability into all aspects of the business. Therefore, it is a proactive approach instead of a reactive approach. This is especially important for SAS as they are unlike Ryanair who experiences sustainability as a by-product of their business model and strategy. The integration of sustainability results in SAS focusing on environmentally adapted products such as locally produced and organic products, on sorting and waste disposal, employee behaviour to enhance efficiency, the optimisation of aircraft utilisation for certain length and time flight routes, and the usage of alternative sustainable jet fuels such as bio fuel.

Ryanair and SAS have vastly different approaches when addressing sustainability, of which Ryanair places no emphasis on the concept and SAS integrates the concept into all business functions. Ryanair's low cost strategy may seem to encourage sustainability however; there are many alternative circumstances to consider as increased air travel poses many challenges for society. It is advised that Ryanair review their low cost strategy in regards to sustainability and consider the integration approach that SAS undertakes or certain aspects of the integration approach such as the implementation of an environmental management system, sustainability repots or environmental programmes.

6 Conclusion

Low cost carriers (LCC) are gaining increased market share with each passing year and enhancing the competitive nature of the aviation industry. There are large amounts of available literature on LCC and FSC, their evolution, aviation environment impacts, and the sustainability of airlines. However, there is a gap when it comes to the field of how sustainability is being addressed by LCC and FSC in their business models and business strategies.

This research experienced difficulties when analysing the environmental performance of Ryanair and SAS due to the varying availability of statistics and data on each case study. It was concluded that Ryanair needs to improve their reporting and publishing of key environmental indicators that relate to the aviation industry and SAS is extremely transparent and informative in publishing key environmental indicators. With regards to the environmental performance it is important that Ryanair improves their reporting on key environmental indicators. However, it is unclear if Ryanair reports on and monitors these aspects but does not make them available to the general public. To improve transparency Ryanair should monitor and publish this information.

Furthermore, this research faced a challenge when analysing the key performance indicators for Ryanair and SAS as again the data for both case studies varied dramatically. However, from the data obtained it was concluded that Ryanair can be classified as a "larger" airline than SAS due to aircraft fleet size, number of passengers, higher RPKs and ASKs, more staff employed and so on. The analysis of environmental performance and key performance indicators for the two case study airlines provided a sufficient knowledge base to facilitate the continuation of the research.

Ryanair, a LCC, operates a low cost business model and a low cost leadership strategy. This provides customers with a 'no frills' airline at the lowest possible fares. This strategy requires the construction of efficient facilitates, strong pursuit of cost reductions, avoidance of marginal customers accounts and cost minimization in service, sales, marketing and so on (Sørensen, 2005). Ryanair's low cost strategy main focus is on their aircraft fleet make up, low service levels, use of secondary and regional airports and direct channel (website) for sales. Ryanair integrates sustainability by purchasing the most technologically advanced Boeing 737 aircrafts, reduces waste, ensures low turnaround times, and maximises utilisation of aircraft. Therefore, it seems that sustainability is a by-product of this low cost strategy and not due to a conscious effort made by the airline. However, additional circumstances such as customer consumption patterns, transportation to secondary airports, increased passengers utilising air travel due to cheap airfares and so on are influencing the standing of sustainability by Ryanair, these circumstances were outside of the scope of the research but could be possible future research topics.

SAS operates a traditional business model that focuses on frequent flyers and a product differentiation strategy. This strategy requires a dynamic aircraft fleet, competent employees, high service level, use of primary airports, numerous destinations, luxury services and Star Alliance programmes. SAS views sustainability as a main area of focus for the airline, which leads to the total integration of the concept into all business functions and practices.

This research analysed how Ryanair and SAS have addressed sustainability through the three generic lenses of: strategy, operations and culture and reviewed Ryanair's environmental stewardship status. From this examination the research highlighted areas that Ryanair and SAS can learn from each other.

The strategic integration lense focuses on technological advancement and fleet renewal. In this regard, Ryanair and SAS are both investing copious amounts of capital into the renewal and improvement of their aircraft fleets. This dramatically addresses sustainability in these airlines as these improvements reduce greenhouse gas emissions, noise emissions and fuel consumption. Therefore, these strategies implemented by the two airlines are ensuring a more sustainable future for the airlines.

The operational integration lense focused on environmental programmes implemented by the airline as these programmes focus on day-to-day operations of the airline. Due to Ryanair's lack of efforts towards sustainability they do not implement environmental programmes or sustainability into their daily operation activities. Therefore, there is no discussion on Ryanair's operational integration of sustainability. On the other hand, SAS has extensive environmental programmes, which focus on all operational activities with the overarching aim of reducing greenhouse gas emissions. From this investigation it is recommended that Ryanair dedicates resources and expertises to integrating sustainability into operational mechanisms of the airline, of which they can review how SAS or competing airlines are achieving this integration, SAS is highly transparent when it comes to this information.

The cultural integration lense focuses on communication and reporting and stakeholder pressure and leadership within these two case study airlines. SAS is excelling in their communication and reporting of sustainability. This is mainly because SAS has a clear focus when it comes to sustainability which is integrated throughout the airline as well as, they follow the global standards such as GRI, which improves their reports created. Ryanair is falling short in this area as they place little emphasis on the communication of their sustainability efforts. This is mainly because there is a lack of efforts and initiatives to report on. Ryanair falls short with regards to corporate social responsibility, sustainability reporting, environmental management systems, implementation of sustainability initiatives and communication of sustainability to public and employees.

Ryanair's and SAS's stakeholders place varying pressures on these two airlines. For Ryanair, the stakeholder's main focus and concerns are on the airline providing the lowest possible fares for customers. This strategy does not include a focus on sustainability. SAS focuses on providing business functions with the integration of sustainability. One of SAS's stakeholders main concerns is reducing greenhouse gas emissions. Therefore, the airline has implemented environmental programmes (Chapter 4, Section 4.3.5.2.1) to take action on this concern. SAS stakeholders see addressing sustainability as a priority and as an integral part of the airline.

Ryanair and SAS's leadership's opinions, beliefs and values with regard to sustainability are greatly dissimilar. Ryanair's leadership is open and honest about their lack of interest in sustainability and does not try filter sustainability values throughout the business, where as SAS is completely different. SAS's CEO is constantly expressing his and the businesses focus on sustainability and its importance. The research recommends that for sustainability to be addressed in a meaningful manner Ryanair will need to undergo changes in leadership's opinions and beliefs with regard to sustainability.

Environmental stewardship refers to a businesses comprehensive understanding and management of critical risks. The more efforts a business takes to be environmentally conscious, the higher their environmental stewardship status. In the case of Ryanair and SAS, Ryanair is falling short of SAS in terms of environmental stewardship. Ryanair fails to embed environmental consciousness into all aspects of the airline, fails to diffuse or translate best practices throughout the airline, which results in them having a weak environmental stewardship status. Ryanair needs to improve their environmental stewardship status and

strategy by incorporating corporate sustainability into their business model and strategies. This will require a conscious effort by setting up a department to facilitate this integration. Ryanair may realise additional cost saving practices if they focus efforts on sustainability and will improve the future security of the company.

SAS is excelling in this regard. SAS implements large amounts of effort into diffusing and translating best practices throughout the airline and with their stakeholders as well as embedding environmental consciousness in all levels of the business.

In general, on a small scale Ryanair does address sustainability in their business model and strategies. However, there is large room for improvement in this area. Ryanair needs to make more of a conscious effort to address sustainability in their business model and strategies. This will not only improve their brand image in the eyes of the customers but also enhance their cost savings and improve their competitive advantage.

In conclusion, SAS is excelling in addressing sustainability, especially in contrast to Ryanair. However, due to the differences in business models, strategies, products and services these two airlines cannot be compared. However, there are a number of learning's that Ryanair and SAS can gain from one another. Ryanair should focus on improving their sustainability focus by establishing an environmental management system, which will result in sustainability reporting. This system and reporting will facilitate the business to become more aware of the areas that require improvement with regard to sustainability. The environmental management system will implement improved communication and training throughout the business so that all employees are dedicated to sustainability and improving efficiency. The outcome of this will be result in cost reductions. Furthermore, SAS should try replicating some of Ryanair's low cost strategies, especially in the area of advanced technology activities such as paper-less boarding passes etc.

Bibliography

Air Transport Action Group (ATAG), (2014). Aviation Benefits Beyond Borders: Powering Global Economic Growth, Employment, Trade Links, Tourism and Support for Sustainable Development through Air Transport. Retrieved from Air Transport Action Group website: http://www.atag.org/

Air Transport Action Group (ATAG), (2015). Aviation Benefits Beyond Borders: Powering Global Economic Growth, Employment, Trade Links, Tourism and Support for Sustainable Development through Air Transport. Retrieved from Air Transport Action Group website: http://www.atag.org/

Air Transport Action Group (ATAG), (2016). Aviation Benefits Beyond Borders: Powering Global Economic Growth, Employment, Trade Links, Tourism and Support for Sustainable Development through Air Transport. Retrieved from Air Transport Action Group website: http://www.atag.org/

Airbus (2015). Mapping Demand 2016/2035. Global Market Forecast. URL: http://www.airbus.com/company/market/global-market-forecast-2016-2035/

Airline Data Project. (2016). Glossary. Retrieved from Global airline industry program website: http://web.mit.edu/airlinedata/www/Res_Glossary.html

Andrews, K.R. (1971). The concept of corporate strategy. Retrieved from https://books.google.hu/books/about/The_concept_of_corporate_strategy.html?id=n0eyAAAAIAAJ&redir_esc=y

Casadesus-Masanell, R., & Ricart, J.E. (2012). From Strategy to Business Models and to Tactics. *American Journal of Business and Management* 1(3), 162-171.

Cento, A. (2009). The Airline Industry: Challenges in the 21st century. Germany: A Springer Company.

Chandler, A (1962). Strategy and Structure: Chapters in the History of the American Industrial Enterprise. MIT.

Cook, G.N., & Goodwin, J. (2008). Airline Networks: A Comparison of Hub-and Spoke and Point-to-Point Systems. *Journal of Aviation/Aerospace Education & Research*, 17, 51- 60

Demydyuk, G. (2011). Optimal Financial Key Performance Indicators: Evidence from the Airline Industry. Lorange Institute of Business, Zurich. 2(1), 39- 51.

Doganis, R. (1985). Flying off Course, The Economics of Internationals Airlines. Unwin European Civil Aviation Conference (1981).

Eccles, R.G., Perkins, K.M., & Serafeim, G. (2012). How to Become a Sustainable Company. MITSloan Management Review: 53(4.)

ELEAA. (2006). Ryanair environmental record, Ryanair Europe's greenest airline. Retrieved from Ryanair website: https://www.ryanair.com/doc/about/ryanair_greenairline_2008.pdf

Ellis, J.H., Harris, N.R.P, Listerm D.H., & Penner, J.E. (1999). Aviation and the Global Atmosphere. Intergovernmental Panel on Climate Change (IPCC).

Eurocontrol (2017). Environmental issues for aviation. Retrieved from website: http://www.eurocontrol.int/articles/environmental-issues-aviation

Ernst & Young. (2015). 4 advantages of incorporating sustainability strategies into your business. Retrieved from EY website: ey.com/ca/pmm

Essays UK. (2013). Corporate Social Responsibility And Ryanair Business Essay. Retrieved from website: https://www.ukessays.com/essays/business/corporate-social-responsibility-and-ryanair-business-essay.php?cref=1

Formisano, R. (2003). What Is Business Strategy? Managers Guide to Strategy: Briefcase books Series. New York: McGraw-Hill Education.

Global Air Transport. (2014). List of LCC based on ICAO definition. Retrieved from website: http://www.icao.int/sustainability/Documents/LCC-List.pdf

Grant, R.M., & Jordan, J., (2015). Foundations of Strategy. Concept of strategy. Europe: John Wiley and Sons Inc.

Holloway, S. (2008). Straight and level: Pracitcal airline economics. Abingdon, United Kingdom: Ashgate.

IATA. (2016). Economic Performance of the airline industry. Retrieved from International Air Transport Association website: www.iata.org/economics.

IPCC (2014). Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Jadhav, A. (2016). Airline Metrics: Revenue Passenger Kilometers retreied from airline geeks website: http://airlinegeeks.com/2016/01/17/airline-metrics-revenue-passenger-kilometers/

Jemioło, W. (2015). Life cycle assessment of current and future passenger air transport in Switzerland. Technology Assessment Group, Laboratory for Energy System Analysis Paul Scherrer Institut (PSI), Switzerland. Master of Science in Energy Management University of Nordland, Bodø, Norway.

Jureviciute, M., Tiina,O,N., Scheyltjens, R.R., & Straka, M. (2013). Best Practices in Corporate Social Responsibility. Mendel University in Brno: Czech Republic, Faculty of Business and Economics

Kee, W. (2015). Comparison of Shareholder value between Full- Service Airlines (FSAs) and Low-Cost Carriers (LCCs). Western Michigan University

Keynes, J.M. (2009). Chapter 2: Characteristics of the Airline Industry. In Cento, A. (2009). The Airline Industry: Challenges in the 21st century. (pp. 13-44). Germany: A Springer Company.

KLM (2016). Annual Report 2016 Royal Dutch Airlines Retrieved from KLM website: https://www.klm.com/corporate/en/publications/2016_Annual_Report.html

Lars Resare. (2017). Interview conducted with Lars Resare, head of environment and CSR department at SAS on 5th April 2017 at SAS headquarters in Stockholm

Lufrtrecht Online. (2001). Transport Policy Guidelines Retrieved from website: http://www.luftrecht-online.de/ipadMENU/index-start.html

MaRS. (2012). Fundamentals of Entrepreneurial Management Workbook 2 Business Model Design Retrieved from MaRS website: http://www.marsdd.com/wp-content/uploads/2012/12/Business-Model-Design-WorkbookGuide.pdf

McManners, P. J. (2016). Developing policy-integrating sustainability: A case study into aviation. *Environmental Science & Policy* 57, 86–92.

Michael O'Leary. (2013). Quotes by Michael O'Leary Retrieved from https://www.theguardian.com/business/shortcuts/2013/nov/08/michael-o-leary-33-daftest-quotes

O'Connell, J.F, & Williams, G. (2005). Passengers' perceptions of low cost airlines and full service carriers: A case study involving Ryanair, Aer Lingus, AirAsia and Malaysia Airlines. *Journal of Air Transport Management* 11, 259–272.

Organisation for Economic Co-operation and Development. (2017). About the OECD. Retrieved from OECD website: http://www.oecd.org/about/.

OECD (2008). OECD Environment Directorate Paris, France retrieved from OECD website: https://www.oecd.org/env/indicators-modelling-outlooks/37551205.pdf

Osterwalder, A., Pigneur, Y., & Tucci, C.L. (2005). Clarifying Business Models: Origins, Present, and Future of the Concept. *Communications of the Association for Information Systems,* 16(1), 1-25.

Penttinen, I & Pohjola, T. (2008). Choice of a Strategy Tool for Eco-Efficiency. Turku University of Applied Sciences and Helsinki University of Technology.

Petrini, M., & Pozzebon, M. (2010). Integrating Sustainability into Business Practices: Learning from Brazilian Firms. Curitiba, 7(4), 362-378.

Reichmuth, J. (2008). Analyses of the European air transport market: Airline Business Models. Retrieved from website: https://ec.europa.eu/transport/sites/transport/files/modes/air/doc/abm_report_2008.pdf

Roberson, B. (2015). Fuel Conservation Strategies: Cost Index Explained Retrieved from Boeing website: http://www.boeing.com/commercial/aeromagazine/articles/2015_q1/archive.html

Rooksby, M. (2015). Aviation Industry Trends, Predictions and Advice 2015. Retrieved from website: http://blog.safe-passage.com/aviation-industry-trends-

Ryanair Annual Report 2015. (2015). Annual Report. Retrieved from ryanair investor relations website: https://investor.ryanair.com/wp-content/uploads/2015/07/Annual-Report-2015.pdf

Ryanair Annual Report 2016. (2016). Annual Report. Retrieved from Ryanair investor relations website: https://investor.ryanair.com/wp-content/uploads/2016/07/Ryanair-Annual-Report-FY16.pdf

Ryanair IR Website. (2017). Ryanair Investor Relations Retrieved from Ryanair website: https://investor.ryanair.com/

Ryanair Website (2017). Ryanair retrieved from website: https://www.ryanair.com/gb/en/

Sarker, M,A,R., Hossan, C.G., & Zaman, L. (2013). Sustainability and Growth of Low Cost Airlines: An Industry Analysis in Global Perspective, East West University, Bangladesh and Abu Dhabi University.

SAS Annual Report 2015/2016. (2016). Annual Report with Sustainability Review November 2015- October 2016. Retrieved from SAS website: http://www.sasgroup.net/en/category/investor-relations/financial-reports/annual-reports/

SAS Sustainability Report . (2016). SAS Sustainability Report November 2015- October 2016. Retrieved from SAS website: http://www.sasgroup.net/en/category/sustainability/sustainability-reports/

SAS Sustainability Report 2014/2015. (2015). SAS Sustainability Report November 2015 – October 2016. Retrieved from SAS website: http://www.sasgroup.net/en/sas-sustainability-report-20142015/

SAS Sustainability Report 2015/2016. (2016). SAS Sustainability Report November 2015 – October 2016. Retrieved from SAS website: http://www.sasgroup.net/en/sas-sustainability-report-20152016/

SAS Website. (2017). Scandinavian Airlines Retrieved from SAS website: http://www.flysas.com/en/uk/

Sørenson, T.C. (2005). An analysis of the European low fare airline industry - with focus on Ryanair. Master's thesis. M.Sc. in EU Business & Law

Statistics Portal. (2015). Statistics and Market Data on Aviation & Aerospace. URL: https://www.statista.com/markets/419/topic/490/aviation/

Strategyzer AG. (2016). The business model canvas Retrieved from Strategyzer website: https://cdn.strategyzer.com/assets/pages/canvases/business-model-canvas-a8509296e3cd543ee7c6881cada7082376d4dfdf4eac40e849490c0dba2d178b.svg

Tarmac Aviation GmbH. (2016). International Low-Cost Airline Market Research. Retrieved from website: http://www.airlineprofiler.eu/2015/10/international-low-cost-airline-market-research/

Teece, D.J. (2010). Business Models, Business Strategy and Innovation. Long Range Planning 43.

The World Bank. (2016). Air transport, passengers carried. URL: http://data.worldbank.org/indicator/IS.AIR.PSGR

UN Global Compact & Duke University. (2010). Environmental Stewardship Strategy Overview and Resource for Corporate Leaders. Retrieved from website: https://www.unglobalcompact.org/docs/issues_doc/Environment/Environmental_Stewardship_Strategy.pdf

United Nations Global Compact (2014). United Nations Global Compact Guide to Corporate Sustainability Retrieved from United Nations Global Compact website: https://www.unglobalcompact.org/

Waitz, I., Townsed, J., Cutcher-Gershenfeld, J., Greitzer, E., & Kerrebrock, J. (2004). Aviation and the Environment A National Vision Statement, Framework for Goals and Recommended Actions. Report to the United States congress

Wensveen, J.G., & Leick, R. (2009). The long-haul low cost carrier: a unique business model. *Journal of Air Transport Management*, 15(3), 127-133.

Whitelegg, J. (2000). AVIATION: the social, economic and environmental impact of flying. Stockholm Environment Institute. University of York, England.

Wordsmyth Dictionary. (2015). Retrieved from website: https://www.wordsmyth.net