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Topic: The Danish governmental sustainability goals of the airline industry's effect on the consumer choice and competitive position of European airline companies operating in the Danish transportation market.

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Abstract

Sustainability and the path to a greener future has become an important topic in the field of business over recent years. Consumers as well as governments have started to demand change of businesses to work towards sustainable practices and supporting green innovations. The European union has made a sustainability goal for the aviation industry to become Co2 neutral and operate on biofuels by 2050 and the aviation industry shares these goals. The Danish government has pushed these goals to even earlier, 2025, for airlines operating in the Danish airspace. This might have certain consequences for the airlines.

This research will examine what these sustainability goals of the Danish government for the aviation industry will mean for the airlines in terms of changes in operations and cost. Based on what is expected changes for the airlines, the research will examine how this might affect the consumer's preferred mode of transport and with that the airlines competitive position. The literature review will lay the foundation of the research and provide knowledge on the airline industry, transport, sustainability and adaptations of regulations and sustainability demands, competitive position and the customers role, customer price sensitivity as well as consumer choice. The research will use different theories, consumer choice, Porter's Five Forces and Porter's Competitive Advantage, to conduct the analysis with primary data obtained through surveys and secondary data through various sources.

The research concludes that the implementation of biofuels will result in a significant increase in cost for airlines and will increase the ticket prices towards consumers in order to operate due to the lack of funding. The data obtained through the survey concludes that the consumer choice will shift as consumers are not willing to pay the price increase and the preferred mode of transport will shift to airlines' substitutes of trains, buses and cars. The shift in the consumers' preferred mode of transport combined with the knowledge obtained through the Porter's theories, concludes that in general the airlines will experience a weakened competitive position. Since the airlines use different competitive strategies, it can affect them differently, which will be examined with secondary data in the research. In general, the airlines will experience a decrease in market share, revenue and profits as well as a decrease or loss of their competitive advantage.

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Chapter 1: Introduction

The research will explore the competitive position of European airline companies and how they are influenced by the Danish governments implemented sustainability goals released in 2022 for the industry. The research will be aimed at examining how the government goals are affecting the European airline companies operating within the Danish airspace, with a focus on their competitive position influenced by consumer behavior. The competitive position of airline companies might change due to the alterations they must undergo to comply with the demands of the Danish government, and this change might either be positive and increase their competitive advantage, or negative and weaken their competitive strength. By researching the European airline industry, the Danish governmental sustainability demands for the airline industry and the airline's competition in the literature review as well as consumer choice and consumer influence on competitive position, the research will be expanded with the use of theories and data. This will be done in order to analyze how the demands of the Danish government are affecting airlines operating within the Danish national borders. Due to their changes to become increasingly environmentally sustainable, it might affect their prices or operations and with that the consumers demand within the competitive field. If the costs are high for the airlines to adapt and if their prices will increase, it can influence their customers' choices of transport within the industry. The assumption within this research is based on the government statement that the costs will have to be divided between airlines and their customers, and thus assuming the prices of air travel will increase for customers. Based on this, the research will analyze if customers would choose other forms of transportation, the in-lands competition of airlines, such as trains or buses. If customers choose cheaper fares by traveling by train or bus, this might have a significant influence on the airline industry operation in lands in Denmark. The research will not look into all European airlines, but only those flying within national borders of Denmark since the government goals only apply to in land flights. Therefore, the research will be specific to the competitive position within Danish borders traveling in Danish airspace.

1.1 Research background

The aviation industry has been working on plans to become more sustainable in their operations for multiple years, and the goal of implementing biofuels has been on the planner for a while. The aviation industry in Europe hopes to operate on biofuels by 2050, and this goal is shared by many European governments. On January 1st in 2022, Denmark is the first country

in Europe to push this goal to 2025 and hope for Co2 neutrality by 2030. The Danish government has announced this goal in the new year's speech to the public and has also informed that not all plans are in place yet, but that the government will not be funding these changes. Multiple scholars and government officials have announced that the costs of implementing biofuels in the aviation industry is a cost that will have to be shared amongst airlines and customers. This has sparked concern amongst airlines operating in the Danish airspace as they have stated that government funding or a type of green tax is needed in order for airlines to succeed. Since Denmark is the first European country to speed up the goal of biofuels in the aviation industry, it is important to explore how this scenario can play out on a smaller scale as it can help predict how it will play out for the European aviation industry as a whole in 2050.

1.2 Problem formulation

In January 2022, the Danish government released new sustainability goals for the airline industry, with the aim to make the airlines flying in lands to operate on biofuels and eventually become Co2 neutral. This goal of the Danish government is set to be achieved by 2025, and Co2 neutrality by 2030 which has gotten international attention by the international airline industry as well as different governments from countries around the world. While the airlines are still awaiting a clear plan of action and information about funding, steps are already being taken in order to manage within the set time frame. Airlines are also aware of the competitive advantage it would give when being able to provide green flights in lands and therefore are eager to achieve said goal, but are held back in their process by the limited funding to support their innovation. This is a dilemma, which researchers speculate, can take many different directions. Either the airlines will have insufficient funding and have steeply increasing costs to operate with biofuels, where consumers either will or will not be willing to pay the price increase and may or may not choose substitutes to travel in lands such as by train, bus or ferry. Or the airline companies will have sufficient funding and will be able to operate on biofuels without a steep increase. Meaning they will either continue with their stable rate of customers or experience an increase and, if it deems successful, they might have a strongly increased competitive advantage within the international market. Researchers argue that the goal of flying on biofuels will become common in the European countries, where the knowledge and

technology, if successful, the airlines operating within Denmark will already have obtained and thus creating a competitive advantage.

The governmental goal of sustainability for the airline industry is new and only limited research has been conducted on how this might influence the airline companies. Most research regarding the new goals are regarding how it would influence the economy if successful, funding, and the boost of sustainability for Denmark and be an example for Europe. Therefore, it can be said that further research on the influence of said goals on the airline industry is important in order to understand how this can affect and or change the industry. This new arising issue within the international airline industry sparked interest to research how the Danish government sustainability goal for the airline industry operating in-lands in Denmark is affecting the airlines. In order to narrow down the scope of the research, it will focus on the goals' effect on the competition of the European airlines and change in consumer choice. This led the research question to be as follows:

How are the danish government sustainability goals regarding the airline industry affecting the consumer choice thus the competitive position of European airline companies operating in the Danish airspace

As mentioned in the scope of the research, the question aims to research how the competitive position is affected by the Danish governmental sustainability goals released in 2022. Which will be done by looking into the current competitiveness of the airline industry, their advantage and the consumer choice and how this might change when biofuels are implemented.

In order to answer the main research question as adequately as possible, several sub research questions will be answered throughout the research as well. One of the research questions is: *What are the adaptations expected of the airline industry in order to comply with the sustainability goals of the Danish government?* This question will help to understand and outline what an airline must change in their operations in order to reach the sustainability goal of the Danish government, and assist to understand how these adaptations can influence the competitive position. To understand the changes it might bring to their competition, a clear understanding must be found on what is actually changing within the airlines to start with. Another sub research question that will be answered is: *To what extent is the customers preferred mode of transport defined by price changes?* As the research aims to answer how the

changes of airlines to comply with the sustainability goals are affecting the airline industry's competitive position, this sub question will help to understand the link between the customers' change of preferred transport and the influence it can have on airlines. If the customers' preferred mode of transport changes due to price increase, it can mean that customers of the airline industry will choose alternative ways of transport to reach their destination. The increase of price as a result of complying with the sustainability goals could therefore change the airline industry's performance. This leads to another sub research question which links together with the customers preferred mode of transport: *How does the change of customers' choice of transport influence the airline industry's competitive position?* This sub question will aim to help understand how changes within the consumer choice as a result of changes in the airlines' operations can affect the industry's competitive position. By looking into the consumer choice shift of preferred mode of transport, the airlines could lose market share, profit and revenue to its substitutional competitors and weaken their performance and competitive position.

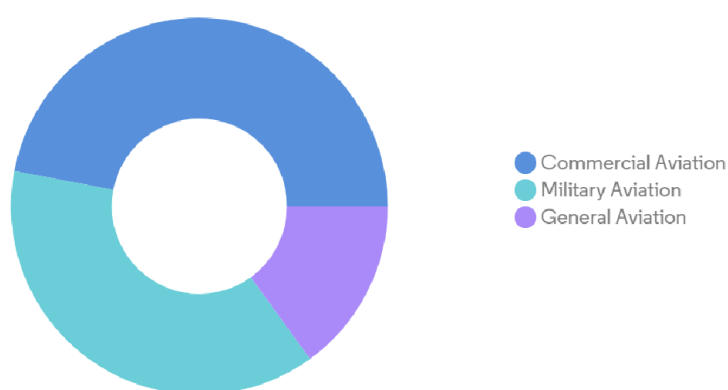
Chapter 2: Literature Review

The literature review will help to understand and define certain terms which will be used in the research. Terms such as the airline industry, sustainability and competition will be defined based upon previously conducted literature, as well as an outline of the Danish governmental sustainability goals and the national transportation market in Denmark. The consumer roles and consumer choice and price sensitivity will also be explored. By defining the terms and creating a foundational understanding of the concepts, it builds a solid base for the research to be conducted.

2.1 Airline industry

The airline industry is a part of the aviation industry concerning only commercial flights. The aviation industry is made up of three sections, commercial aviation, military aviation and general aviation (MI, 2022). Commercial aviation is made up of all airlines flying people from one destination to another, while military or general aviation includes transporting goods as well as transport for military purposes. In this research, the airline industry is defined by the transport of people, commercial aviation, in order to narrow down the scope of the research. In figure 1, it shows the market revenue share between the three categories of aviation. The figure shows that commercial aviation makes up almost 50% of the revenue in the aviation industry (MI, 2022).

Europe Aviation Market : Revenue Share (%), by Type, 2020



Source: Mordor Intelligence

Figure 1: The European aviation market: Revenue Share, 2020. (MI, 2022)

To continue, within the European airline industry, the competitive market is considered imperfect and consolidated with a few large players based in England, Germany and France.

Considering the strong impact of COVID-19 on the airline industry, they experienced a drastic decline and restrictions on commercial flights, the industry is still expected to experience a growth of 7.47% by 2027. (MI, 2022)

As airlines and their competitive strategies are nowadays based on truly global strategies, some researchers argued that governmental policies and roles are diminishing. However, according to Porter (1990) and Krugman (1991) through Debbage (1994, p. 192), governmental policies can still impact movement of goods and people as well as give a competitive advantage or disadvantage (Debbage, 1994, p. 192). Therefore, it can be argued that even though the airline industry is a very international and globally operating industry, they are still influenced by government policies.

Furthermore, as the research will look into the sustainability goals, it is important to have a foundation of knowledge on which sustainability efforts the airline industry in Europe is already undertaking. This is important to define since it can influence their competitive strength. The Scandinavian airlines had already established the goal of decreasing their Co2 output by 30% by 2030 (Barfoed, 2022). However, other firms such as KLM or Norwegian also have adapted certain ecological sustainability strategies. For example, KLM has established a collaboration with SkyNRG and SHV to develop the first European durable fuel factory producing kerosene fuel in order to decrease their Co2 output by 85% (SkyNRG, 2019). Another example would be Norwegian air and their #iflygreen processes, where they are trying to decrease their Co2 output by decreasing their use of single use plastic and new operating systems such as Wi-Fi (Norwegian, 2020).

After having defined the airline industry and its players in Danish airspace, it is important to note that the competitive field also includes the airlines' substitutes such as train and bus. Therefore, the transportation within Danish borders will also be looked into.

2.1.1 Transportation within Denmark

Since the government sustainability goal for the airline industry refers to national flights within the Danish borders, it is important to understand the different means of transportation within Denmark and who make up the competition for danish airline companies in the danish national flight market.

As the research will focus on the in-lands' competition of airline companies, the competition is made up of the competitors taking the same routes as the airlines within Denmark, which is the connecting flights between Billund, Aalborg, Aarhus, Esbjerg, Karup, Bornholm, Sønderborg and Copenhagen (World data, 2020).

IATA	Name	City	Airlines	Destinations
CPH	Copenhagen Kastrup Airport	Copenhagen	61	121
BLL	Billund Airport	Billund	14	39
AAL	Aalborg Airport	Aalborg	10	13
AAR	Aarhus Airport	Aarhus	3	8
EBJ	Esbjerg Airport	Esbjerg	2	2
KRP	Karup Airport	Karup	1	1
RNN	Bornholm Airport	Rønne	1	1
SGD	Sønderborg Airport	Sønderborg	1	1

Figure 2: The public airports in Denmark. (World Data, 2020)

There are several Danish airlines that take these specific routes, such as SAS, DAT, AlsieExpress, but also several international airlines competing in the Danish airspace routes. These are KLM, Norwegian Air, LuftHansa, British Airways, RyanAir and Air France and other international airlines who offer national stops along their continuing routes. As shown in figure 3, taking the limitation of the COVID-19 impact on air travel in mind, there is a stable average of approximately 250,000 passengers flying nationally from the danish manned public airports.

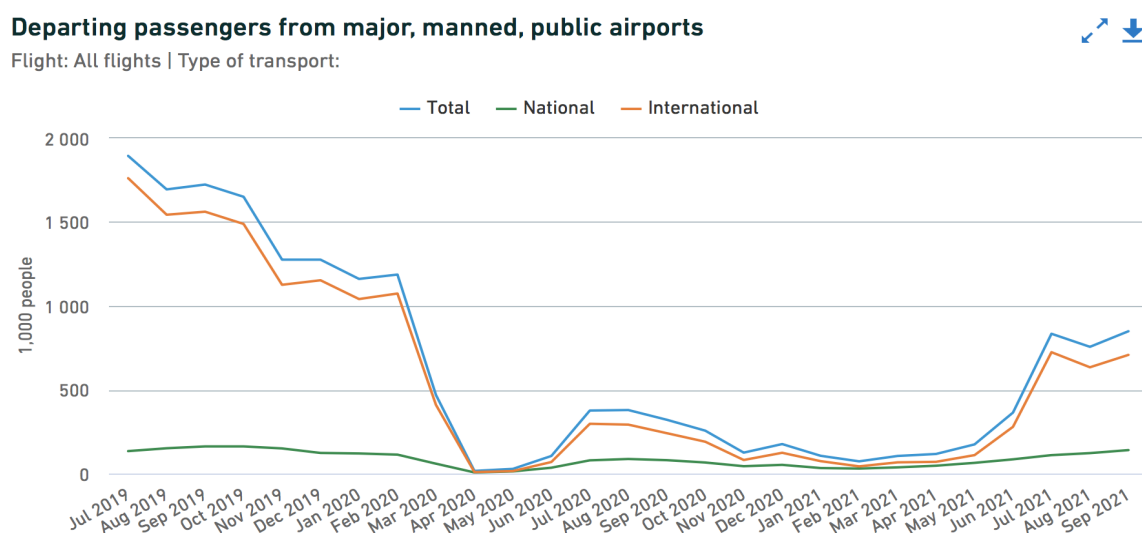


Figure 3: departing passengers from major, manned, public airports. (Statistik Denmark, 2021)

Looking at the available literature, the airline competition within only airlines is made up of several danish companies, SAS, Alsie Express, DAT, Cimber, Copenhagen Air Taxi, Jet Time, North Flying, Nordic Seaplanes, Sun-air of Scandinavia, as well as multiple international airlines such as KLM, Air France, British Airways, Norwegian Air, Ryan Air, LuftHansa. However, the national routes also have other competitors, with one of them being rail transport by train, as well as bus, ferry and car. With NT, Kombardo, and DSB being some of the largest in the public transport field which are substitutional competitors of the airline industry within the Danish borders. They need to be considered as, depending on the consumer choice and threat of switching, are playing a strong competitive role. The competition and forms of transport will be further analyzed in the Porter's Five Forces model in the analysis chapter.

Based on the literature, it can be said that the airline industry's competition is made up from different airlines, national and international, as well as railroad transport, ferry and bus transport and private vehicles.

2.2 Sustainability

As the research will look into sustainability goals, it is important to understand the definition of sustainability in order to have a basic understanding of what a sustainability goal defines. Sustainability is a rather broad term and can be defined in different ways. Jamieson (1998) defines it broadly as human survivability and the avoidance of ecological disaster. However, as Jamieson (1998) mentions in his research, sustainability is concerning the welfare of future generations and with that the obligations to guarantee future generations' capacity to produce in the form of a minimum level of natural capital (Jamieson, 1998). Kenny and Meadowcroft (2002) argue that ecological sustainability is becoming increasingly important in nowadays business practices. Alike the argument of Cocklin (2009) who states that sustainability in environmental management has been recognized as a priority where governments attempt to achieve sustainability. Subsequently, Cocklin (2009) also states that there is a lack of frameworks to evaluate the implications of policies and the planning of sustainability (Cocklin, 2009). Within this research, the term sustainability will be defined combining the terms of Jamieson (1998) and Cocklin (2009), where sustainability is defined as the avoidance of ecological disaster by guaranteeing future generations capacity to produce in the form of a minimum level of natural capital. As well as acknowledging the lack of proper

frameworks to evaluate the implications of said sustainability policies. Taking in mind the definition of sustainability and the lack of adequate frameworks to evaluate its implications, it highlights the knowledge gap mentioned in the research on how the sustainability goals are in fact influencing the European airline industry.

2.2.1 Danish Government sustainability goals regarding the airline industry

In order to conduct the research, it needs to be clarified which goals for sustainability within the airline industry have been implemented by the Danish government and how they are defined within the industry. Since the sustainability goals for the mentioned industry are a new concept, the information to clarify the sustainability goals will be obtained through the government press conference release, as well as quoted political statements from different government officials through news articles.

In the new year's conference of 2022 from the danish government, the prime minister of Denmark, Mette Frederiksen, has released new environmental sustainability goals for the airline industry. Mette Frederiksen has released a press conference statement that the government is implementing the goal of flying within Denmark on biofuel by 2025, and totally green (also called co2 neutral) by 2030 (StatsMinisteriet, 2022). Before the release of this government implemented goal, the airline industry had its own environmental sustainability goal to reduce their co2 emission by 30% before the year of 2030 (Barfoed, 2022). The prime minister, Mette Frederiksen, also stated in the press conference that the knowledge and technology needed in order to reach these goals are already available, and the researchers and the airline and green fuel companies are already in process to find the solution (StatsMinisteriet, 2022). Some politicians, such as Dan Jørgensen, argue that this is an extremely complicated task for the industry. He also argues that one way to achieve this is to implement an Co2- tariff, which instead of going to the danish tax system, is going to the airline industry to assist the industry to reach the green co2 neutral change, by investing in innovation (Barfoed, 2022). Furthermore, Dan Jørgensen also states that in order for this to be successful, the green fuel will have to go up in scale and down in price in order to not harm the airline industry (Barfoed, 2022). He argues that without the Co2 tariffs and the decrease in cost of biofuel, the airline industry will be damaged by the high costs of achieving this goal through innovation and swapping their fuels for bio green fuels. However, the government has stated that, until another solution is found and implemented, the increased costs of green fuel for the airline will be

shared between airlines and their customers (Ritzau a, 2022). This also includes the cost of innovation and implementing the green operations for the airline firms.

The sustainability goal for the airline industry has received international attention, with a common question in mind, how it is possible to achieve this goal without funds to support the process (Skouboe, 2022). The industry is aware of the fact that green biofuels are up to five times more expensive than the traditional airplane fuel, and costs will be high to pursue the development demanded by the government. Therefore, the industry and ‘‘Luftfartens Klimapartnerskab’’ (airline climate partnership) has recommended a climate fund, financed by a climate tariff, in order to support and stimulate innovation for the airline industry. Thus far there are limited factories producing biofuels fitting for the airline industry and the process to develop such fuels is in progress but not fully realized yet. (Skouboe, 2022)

As mentioned, the government has not yet given further information on how this will be achieved or financed, besides the statement that the cost until thus far will have to be divided by the airline companies and their customers. A professor from Syddansk University, Henrik Wenzel, has stated that the goal and the time frame is realistic to achieve for the airline industry but there is a need for incitement on how the industry can start with this process. He argues that it is currently a political problem to find a model where they can allow a climate tariff on the airplane tickets sold by the airlines to finance the cost of biofuels (Ritzau b, 2022)

The Danish governmental goal of biofuels for the aviation industry is not just a national Danish goal, as according to the aviation industry, they have the goal to become net zero by 2050 (KLM, 2022). As this is a shared goal of the aviation industry and the EU, it is an international shared objective. The Paris agreement also covers the agreement to decrease emissions in the EU including the aviation industry with the deadline also at 2050 (European Commission, 2022).

2.2.2 Adaptation of regulations

An example of the airline industry adapting to regulations by governments is the COVID-19 situation. The governments worldwide had limited travel by implementing regulations regarding the spread of COVID-19, where the borders of countries would be closed for travel, COVID passports were required and strict restrictions on leisure travel. According to William (2020) the airlines only operated 30-50% of flights they otherwise would operate, and experienced temporary and permanent closing of air fleets. The airlines experienced an increase

in demand again after the implementation of quick-test centers (Williams, 2020). The regulations of the different governments on air traffic did have a significant negative influence on many airlines, and multiple airlines such as Danish Air went bankrupt during this period. In this specific example, the airlines had limited freedom in adapting to the COVID-19 regulations, since it prevented customers from purchasing flights.

In other cases, however, such as the current increasing regulations surrounding sustainability, shows that airlines take different approaches of adaptation. Norwegian Air has launched the #IFlyGreen campaign where customers can choose to fly green where some items on the flights are substituted such as plastic cutlery for wooden cutlery or plastic cups for paper cups, as well as trees that are planted to compensate for the Co₂ release of the flight (Norwegian Air, 2022). Another example of a different approach is that of KLM, where they have started to produce sustainable aviation fuel, operational efficiency and innovative aircrafts to reduce Co₂. The sustainable aviation fuel production is a more long-term approach, since biofuel production for aviation is rare and might result in high costs of said fuel as well as strong competition around the resources as it might eventually become inevitable to use biofuel in their aviation operations. For KLM to start their own production of sustainable aviation fuel might give them a strong advantage in the future if that would become the global demand as the aviation industry is expecting to be in 2050 (KLM, 2022). Airlines can take different approaches towards regulations depending on their strategy of choice and their specific company goal. However, within the EU there are some restrictions to what the aviation airline can do. For example, in the EU, ‘‘agreements that restrict competition are prohibited’’ to avoid monopolistic behavior (Baum, Auerbach, 2017). Another restriction affecting airline’s strategy making is that airlines in dominant positions are prohibited from abusing that position to avoid driving out another competitor on a specific route (Baum, Auerbach, 2017).

Since airlines have adapted to certain demands, restrictions or regulations differently, it is to be assumed that airlines will adapt differently to the new green goal of the Danish government, and also when it becomes a shared EU goal in 2050.

2.2.3 Adaptation of sustainability

Sustainability is becoming a global objective for many industries due to the government regulations changing towards a greener future as well as consumers demanding greener options. Aviation is the transport mode with the fastest increasing emissions, and according to the Paris agreement, is required to take action on decreasing their emissions and work towards

operations on biofuels and Co2 neutrality (European Federation for Transport and Environment, 2022). Aside from the Danish government objective to operate on biofuels, the European airline industry has experienced increasing pressure from the consumers, governments and EU and aviation agreements to adopt sustainability changes in their operations. Many European airlines have adopted smaller changes such as the swapping of plastics to biodegradable options, or increased efficiency in their routing, as well as purchasing forests and reforestation to compensate Co2. RyanAir has taken another approach of investing in new aircraft technology and sustainable biofuels just like SAS group (SAS group, 2022) (RyanAir, 2022). British Airways have combined these approaches by investing like RyanAir while also making waste changes such as Norwegian Air as well as supporting wildlife development and protection (British Airways, 2022). This is the same approach as Lufthansa Group is taking (Lufthansa Group, 2022).

The different European airlines are dependent on aviation biofuel and modern ecological aircrafts to make significant changes in their process to become sustainable. However, the adaptation process to become sustainable with biofuels can have certain impacts on the airline industry. As KLM stated, they have the biofuel but need more demand of the fuel to decrease the price and produce more, but demand is not increasing due to the current high prices of said fuel (KLM, 2022). Eventually it will become inevitable to use biofuels where the demand will increase and due to economies of scale the price of production will drop. However, there is a risk as when a good is scarce, the price will increase. Therefore, there is a risk of extremely high fuel prices for the aviation industry as they are adapting to the biofuel restriction, which might take time to overcome until the production has increased and dropped in price. (KLM, 2022)

2.2.4 Customer price sensitivity on sustainability adaptations

According to Williams (Williams, 2020) within the airline industry there are already four factors that influence pricing in normal circumstances. The four factors are what you buy, when you buy, when you fly and finally where you fly (Williams, 2020). Borenstein and Rose (1994) suggest that price dispersion increases with competition, and flights have a usual increase of price dispersion on routes with high competition, lower flight density as well as the willingness of switching to alternatives of consumers (Borenstein and Rose, 1994). Thus, flights often range in price depending on several factors mentioned by Williams (2020) and

Borenstein and Rose (1994), to which consumers are able to choose between these factors and therefore price. However, with the biofuel and green goals becoming a reality starting in Denmark, and also the aviation industry's commitment to make it a reality internationally, the prices will increase. As mentioned, the prices of biofuels are five times higher than their current fuel, and the costs will be carried between consumers and the industry. A concern of the aviation industry is that the price increase, which is needed to make it possible, might be too significant for the consumers, and will drop in sales.

According to a study by Rahman and Haque (2011), customers will be sensitive to price changes, but how sensitive depends on many factors. If price increase occurs due to sustainable changes, certain factors influence how sensitive certain customers will be towards said price increase. These factors are (1) gender, where studies have shown that women are more likely to become green consumers and will be less sensitive to the price changes than men. (2) age, where younger consumers are more concerned of the environmental issues and are less sensitive to price changes than older consumer groups which according to studies is 30+. (3) education, studies have shown that higher educated consumers are more understanding and sensitive to the environmental issues and will be less sensitive to price changes than lower educated consumers. (4) purchasing power, where studies suggest that consumers who have a higher-than-average purchasing power might be less sensitive to price increases than consumers who earn average or low income. (Rahman and Haque, 2011) It suggests that consumers with stronger environmental sensitivity are more willing and acceptant of price increases for sustainable options and pay a price increase of up to 10 percent (Bang et al., 2000; Paladino, 2006 through Rahman and Haque, 2011).

2.3 Competitive position

As the research will analyze how the airline industry is affected by the Danish government sustainability goals, it is important to define and clarify the term competition as well as what a competitive position is for a company. The term competitive advantage will also be researched as it influences a competitive position of a company.

Competition is a rather broad term with different definitions depending on the context. However, within this research the definition of Stigler (1988) will be used, which states that competition is '*a rivalry between individuals (or groups or nations), and it arises whenever two or more parties strive for something that all cannot obtain*' (Listra, 2015). In this case the rivalry is between companies within an industry that strive for market share, where not all can

own the whole market, and therefore compete amongst each other. There are different levels of competition, which can either be firm, market and industry level, location, region to country level as well as firm, cluster to countries (Listra, 2015). Within this research the national inland transport of Denmark and its competition will be looked into, to explain further changes in the international competitive airline industry of Europe.

Competitive advantage can be defined as an above average performance in the long term (Porter, 1985). According to Barney and Hesterly (2008) a competitive advantage is distinguished by two types, temporary competitive advantage and sustainable competitive advantage. Temporary competitive advantage can be obtained through strategies which eventually can be imitated by competitors. Whereas if competitors cannot imitate the strategy, then the company has obtained sustainable competitive advantage. Barney (1991) states ‘‘a firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy’’ (Barney, 1991). According to Day and Wensley (1988) two main factors are involved in the creation of competitive advantage, which are superior skills and superior resources. While according to Porter (1985) competitive advantage can either be obtained through low cost or differentiation. To continue, a company’s competitive position is defined by their competitive strength and competitive advantage (Porter, 1985). If a company is positioned in the competitive market as performing above average, it has a competitive advantage and vice versa. Therefore, a company’s competitive position is defined by their performance and their competitive advantage (Porter, 1985).

2.3.1 Competitive position customer role

When looking into the competitive position of firms, it is important to note what role the consumers play in it and how they influence the competitive position. As stated by Songling, Ishtiaq, Anwar & Ahmed (2018), governmental financial support is crucial for industries to maintain a sustainable competitive position. However, as the Danish government has announced, that they are not supporting the aviation industry with funding to assist the sustainability goal placed upon the industry and that the costs should be carried between consumer and the firm. This could mean that the aviation industry is partly relying on the consumers' financial participation in order to achieve this goal, and with that, can influence their competitive position. According to Waterson (2003), consumers play a role in the

competitive position of firms. Depending on the number of players in the industry and the price difference, when consumers have multiple choices and price options, they have a stronger influence on a firm's competitive position. To clarify, when the firms and prices are at monopoly level, consumers can only choose one price option and have no direct substitutes, then the consumers have a lower impact on the competitive position than when there are many players in the industry and at various price levels. This would mean that firms' competitive position is also dependent on the consumers' choice. (Waterson, 2003)

As a firm's competitive position is defined by their performance and their competitive advantage (Porter, 1985), customers can influence their competitive position by choosing other players in the industry and with that negatively affecting their performance or vice versa. If firms have advanced technology, economies of scale or unique resources as their competitive advantage, it does not necessarily guarantee the consumers choice and won't necessarily improve their competitive position. If consumers choose airline substitutes as an example, this will decrease revenue, profit, and market share of the airlines and this would negatively impact the competitive position.

2.3.2 Customer price sensitivity influence on competitive position

Continuing on the statement of Waterson (2003), that consumers play a role and influence a firm's competitive position, as well as the statement of Rahman and Haque (2011) that consumers are sensitive to price especially in a market with a lot of price differentiation, it can be argued that with significant price change in the aviation industry, certain consumers might opt for other choices in the transportation market and with that influence the competitive position. As mentioned, the aviation industry has many international players who have various sustainable strategies and price ranges and has several substitutes. With the focus on the Danish in-land routes, the consumers have a wide range of price choices for air travel as well as the choice of substitutes such as train, bus and ferry and different price choices. As stated by Waterson (2003), when consumers have more choices between players and prices, they can have a stronger influence on the firm's competitive advantage. Combining this information with the statement that the consumers are price sensitive and are assumed to only be willing to pay a premium price of 10% extra for greener choices. As well as the statement of the Danish government and the aviation industry that the prices might increase significantly to cover the costs of the biofuels, it can be said that the price sensitivity of consumers and their impact on the competitive position of firms, might limit firms in the aviation industry to undergo

significant price increases to cover the costs of operating on biofuels as it might have a negative influence on their competitive position.

2.4 Consumer choice

After having looked into consumer price sensitivity related to sustainability and its influence on competitive positions, it is important to understand that consumer price sensitivity and consumer choice go hand in hand. When a consumer is sensitive to price alterations, it might change their preferences as a consumer's income or budget can constrain their choices. Since the research will be looking into how consumer choice is affecting competitive position, it is vital to understand the definition and its link to the competitive position.

Consumer choice can be defined as the subjective preference of the individual customer of various groups of goods or services, such as in this case mode of transport, within their budget (Pettinger, 2017). As the term itself states, consumers choose one option over the other and with that take the opportunity cost. According to Currim and Sarin (1984), there are two classes of consumer choice, which are their preferences under certainty and preference under uncertainty. They state that it depends on the environment of the consumer and if it increases the risk of purchasing certain goods or services or if the environment is stable. This means that the environment of the consumer could influence their subjective choice of goods or services. Furthermore, according to Muro-Rodriguez, Perez-Jiménez and Gutiérrez-Broncano (2017) the consumer behavior in the choice of mode of transport is mainly defined by the comfort and price of the transport in comparison to other variables. The theory of consumer choice will be further explored in the theoretical background chapter.

2.4.1 Consumer choice effect on competitive position

Besides looking into the consumer price sensitivity influence on the competitive position, it is also important to look how the customer choice is affecting the competitive position of the airline companies. Therefore, the connection between consumer choice and competitive position will be researched. As stated by Muro-Rodriguez, Perez-Jiménez and Gutiérrez-Broncano (2017), certain variables define the choice of consumers. Similar to the influence that consumer price sensitivity has on the competitive position, the choice of consumers can influence the performance of companies. It could affect the performance of firms negatively if consumers choose competitors, as this will decrease their sales and revenue.

It can also have a positive effect on performance if consumers are loyal to the company or more consumers choose said company and thus increase their sales and revenue. For example, when a company has a competitive advantage through for instance green innovations, it could attract more consumers if the good or service is priced reasonably in relation to the other competitors and the good or service offered. However, if the price is too high according to the consumer and loses its utility, then consumers might choose other options in the market. As a result, it might harm the performance of the company due to drop or lack in sales and have a negative influence on the competitive position. Simply put, companies are dependent on consumers for sales and earnings and if consumers pick their competitors, they will lose revenue and profits and decrease in performance. The change in performance creates the change in competitive position. (Porter, 1985)

Chapter 3: Theoretical Background

The theories chosen to conduct the research are Consumer Choice theory, Porter's Five Forces and Porter's Competitive Advantage, which will be explained in this section to create an understanding of the theories as well as how they can assist the research.

3.1 Consumer Choice Theory

The theory of consumer choice is examining the human consciousness surrounding the allocation of rational consumers income on a range of goods or services. The theory is based on consumer behaviorism and the axioms to measure consumer choice through marginal utility. (Gowdy and Mayumi, 2001) Marginal utility is defined as "the additional satisfaction or benefit that a consumer gains from buying an additional unit of a commodity or service" (Nolen, No date). The theory assumes that consumers will choose one option over the other if it increases their utility and fits within their budget. Marginal utility assumes that if a consumer purchases more of a certain good, it will increase their utility even more.

The theory uses a set of axioms to measure consumer choice, which are:

- 1) When consumers are faced with different combinations of commodities that can be measured in quantities, neither risk nor uncertainty is involved.
- 2) When consumers are given two different commodity bundle options, they will prefer one over the other or be indifferent to the options.
- 3) The choice of the consumers does not alternate during the time period of the study.
- 4) There is no saturation, meaning consumers will choose one over the other by adding at least one commodity
- 5) The lack of preference is transitive.
- 6) "The principle of complementarity"

(Gowdy and Mayumi, 2001)

The consumer choice theory uses the axioms to measure the marginal utility of consumers to predict or calculate which of the commodity bundles a consumer would choose. Furthermore, according to Georgescu-Roegen (1968) (through Gowdy and Mayumi, 2001), the consumers are "middle class individuals" and assumes that the budget of the consumers can be spent on conveniences. These axioms and assumptions are made in order to measure their choices within constant environments.

The theory uses mathematical equations to calculate the consumer's optimal choice. By calculating the optimal bundle on the budget line, it can be predicted which choices consumers will make. The figure shows that certain options are outside of the consumers' budget, and others can be optimized. However, this paper will not go in further depth on the mathematical part of the theory since the mathematical equations will not be used in the analysis. (Emerson, 2019)

3.2 Porter's Five Forces

The Porter's Five Forces theory will be used to examine the current competitiveness of the airline industry as well as attempt to predict any changes in the competitiveness when airlines implement biofuels. This can assist the research to understand changes in their competitive position.

The theory of Porter's Five Forces was found by Micheal Porter in 1979 published in Harvard Business Review. The theory recognizes the different outside forces that influence an industry's competition besides the existing competitive rivalry amongst competitors. The theory helps to understand the different competitive factors as well as which players in the industry hold high or low power and can determine the activities within the industry. (Bruijl, 2018) Bruijl et al states that in the quickly changing and innovative business environment, the theory of Porter has shifted from looking at the existing competitive environment to seeking opportunities for new innovation within the market or new markets (Bruijl, 2018). Considering the theory and its use to understand the changing environment of the airline industry, the following statement helps to understand how the theory can assist in examining the change in the airline industry. "individual forces and their collective impact will change as the government policies and macroeconomic and environmental conditions change"(Mohapatra, 2012). As stated by Mohapatra (2012), the individual forces of an industry's competition will change by government policies, for which this theory is chosen to understand how the competitive factors are changing.

The theory is based on a model, showing the five different forces in an industry or environment. The different forces mentioned in the theory are (1) Competitive rivalry, (2) Threat of potential new entrants, (3) bargaining power of suppliers, (4) bargaining power of buyers and lastly (5) the threat of substitute products or services (Bruijl, 2018) (Porter, 1979).

The first factor of existing competitive rivalry looks into the significance of the rivalry which might influence the profitability of the industry. Depending on the intensity of competition, companies might introduce competitive measures such as marketing or service improvements, new product releases, or discounts on price and special offers. Other factors determining the existing rivalry are the number of players in the industry, the costs and growth rates amongst others. (Bruijl, 2018) (Porter, 1979)

The second factor influencing the competition of an industry is the threat of new entrants. According to Porter (1979), new entrants in the industry will have the desire to gain market share which puts pressure on prices, costs, and need of investment (Porter, 1979). In order to understand the extent that new entrants can put this pressure on the competition within the industry, it will need to be known how high the entry barriers are. If the entry barriers are high, and there are limited players in the industry, there will not be a sudden disruption in the industry affecting the competitive position. However, if the entry barriers are low and there are many companies competing for market share it can disrupt the competitive market. Since the demand in the industry does not suddenly increase it might decrease profit margins or affect competitive advantages. (Bruijl, 2018) (Porter, 1979)

The third factor is bargaining power of suppliers, which looks into the extent that suppliers can determine prices in the market. If suppliers have high supplier power, they could increase the prices of their own products and services and if the companies cannot carry the increase of cost then it will result in an increase of their own prices. The supplier power can be defined by different indicators, such as the number of suppliers. If there are only a few suppliers within the industry, it might mean that companies are more dependent on them for products as it is more concentrated than the industry. Another indicator can be if the suppliers have multiple industries they sell to and the industry is not the main or most important consumer. Lastly, if suppliers are dependent on the industry as the main consumer or collaborate closely and are dependent on each other for profit, it could decrease the supplier power. (Bruijl, 2018) (Porter, 1979)

The fourth factor is the bargaining power of buyers, which helps to understand the extent that buyers can influence prices. Buyers can either be other organizations or companies or customers. If the number of buyers is high and can easily switch suppliers, the buyers will have a high bargaining power. Like supplier power, there are multiple indicators that show the extent of the buyer power such as the number of suppliers compared to the number of buyers. If there are only a few suppliers and many buyers, a monopoly, buyers have little power to influence the prices since they cannot change suppliers easily. High switching costs in an

industry can also limit a buyers' capability to switch to other suppliers and lower their buying power. To summarize, a buyer has low bargaining power if there are many buyers, few supplier options, and are segmented (Bruijl, 2018). Buyers have high bargaining power if there are many suppliers, limited buyers or large buyers, and are sensitive to price changes with low switching costs. (Bruijl, 2018) (Porter, 1979).

The fifth and the last factor of Porter's Five Forces is the threat of substitute products or services. If there are other substitutes products or services in the market, it can influence the competition due to the substitutes competing for the same market share. A substitute is a product or service that can fulfill the same or similar purpose as the industry (Bruijl, 2018). There are certain aspects that can influence the threat of substitute products, such as switching costs. If the switching cost between the industry's products and the substitute products are low, buyers might switch to the substitute when experiencing price increases and vice versa. However, if the switching cost is high, then the existence of substitutes will have a lower impact on the competition within the industry. Another aspect is how closely related the goods are and the buyers' willingness to switch. If the products or services are very similar to one another, buyers might pick the product with the lowest price. However, if the difference is big between substitutes and the industry's product, the buyers might evaluate on multiple factors if the change is satisfactory or if the price increase is small enough to not switch. (Bruijl, 2018) (Porter, 1997)

To summarize, the theory of Porter's Five Forces will look into the five different factors influencing the competition of an industry and assist in examining the current competition of the airline industry as well as how the government goals are changing the competition.

3.3 Porter's Competitive Advantage

Since the airline industry is expected to make certain changes, such as using biofuels, it can change the industry's competition, as will be analyzed with Porter's Five Forces. The theory of Porter's competitive advantage can help to understand what their current competitive strategy is as well as if this changes their strategy and if it can give them a competitive advantage or disadvantage.

The theory of Porter's generic strategies for competitive advantage was written by Michael Porter in 1985 and released in Harvard Business Review. The theory discusses how companies can adapt certain competitive strategies in order to obtain a competitive advantage. The position of a company in the competitive market is important to know as when it can be

below or above the industry's average and having a good position can earn high rates of return (Porter, 1985) By obtaining an above average performance in the long run is equal to a sustainable competitive advantage (Porter, 1985) According to Porter, there are two generic types of competitive advantage a company can possess which is low cost or differentiation. Having a cost advantage or differentiation comes from industry structure and the company's ability to cope with the competitive five forces better than its competitors (Porters, 1985). Including the scope of activities, there are three strategies to achieve a competitive advantage, which are cost leadership, differentiation and focus, where the focus strategy has two variants of cost focus and differentiation focus.

		COMPETITIVE ADVANTAGE	
		Lower Cost	Differentiation
COMPETITIVE SCOPE	Broad Target	1. Cost Leadership	2. Differentiation
	Narrow Target	3A. Cost Focus	3B. Differentiation Focus

Figure 4: Porter's model of generic strategies (Porter, 1985)

The first strategy is cost leadership, where a company aims to be the lowest cost producer in the industry. This can be obtained through different means, such as economies of scale, technology, or access to cheaper raw materials, depending on the structure of the industry. In order to become a low-cost producer, a company must exploit all means of cost advantage and if it can do so it can position itself as an above average performer (Porter, 1985).

The differentiation strategy focuses on being different and unique than its competitors within certain aspects that are highly valued by buyers. For example, ecological sustainability is highly valued in nowadays society, and a firm could implement measures to become the

sustainable player in the industry to differentiate from its competitors and increase market share or increase price. (Porter, 1985)

The third strategy of focus concentrates on a narrow competitive scope within the industry (Porter, 1985). The company selects a certain aspect or target within the industry, for example specific products or customers, and adapts one of the previously mentioned strategies to the specific target or segment. The theory has two variations, cost focus and differentiation focus. Cost focus concentrates on obtaining a cost advantage within its target segment. Differentiation focus concentrates on differentiation and uniqueness within its target segment. The company might use the focus strategy if there is a significant difference in needs or have different operating processes within the specific target segment. (Porter, 1985) (IFM, no date)

Chapter 4: Theoretical conceptual framework

The theoretical conceptual framework aims to summarize the findings literature review and create the framework for the analysis of the research. Figure 5 shows the theoretical conceptual framework.

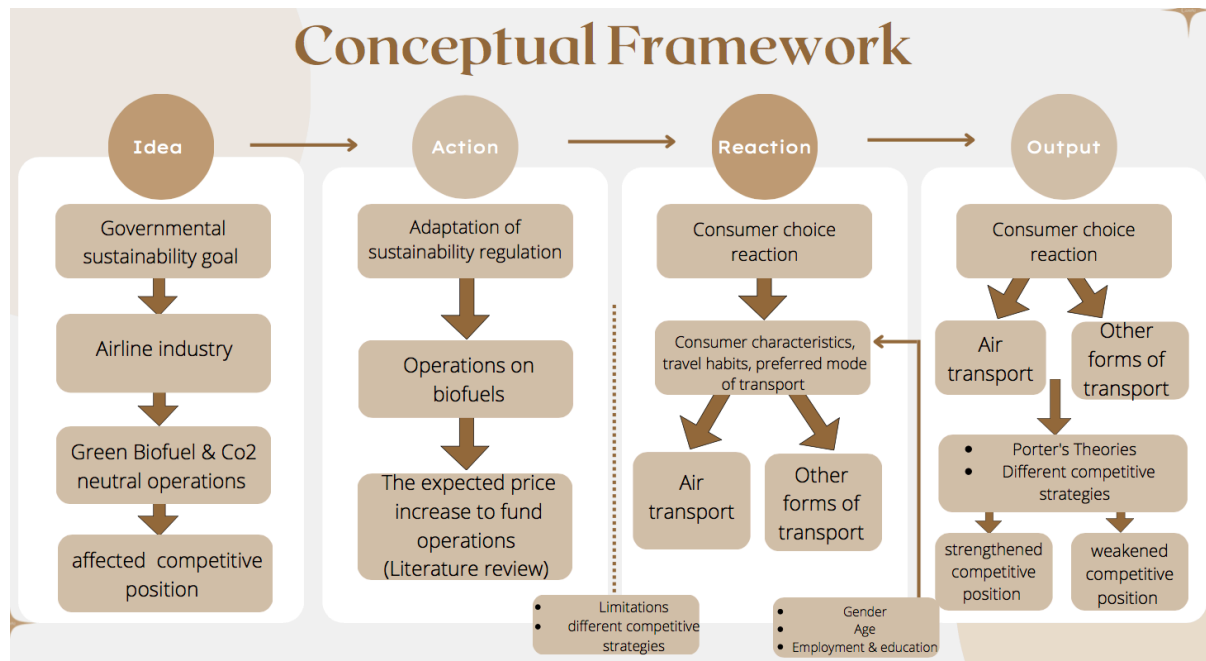


Figure 5: Theoretical conceptual framework, (Author's compilation)

Idea:

The idea of the research is based on the sustainability goal towards the airline industry which is for them to decrease Co2 output by 70% and eventually become Co2 neutral. The first regulation to achieve this goal is to change their fuels for biofuels. Denmark is the first country to speed up the sustainability goal to push it to the year of 2025-2030. This means that the airlines flying within the Danish airspace have to change their operations to function on biofuels. This goal is expected within the entire Europe by 2050.

The literature review explains the governmental sustainability goals of Denmark towards the airline industry, as well as the competitive field of the airline industry within the danish national borders, which is made up from international airlines, national airlines and substitutional transport such as trains and buses.

The government expects this goal to be achieved with biofuels and has released information on the refusal of governmental funding and stated that the costs of the adaptation of this goal will need to be split between consumer and the airline. This sparked concern

amongst airlines of how this might financially affect them and created the interest of the research.

Action:

To realize the sustainability goal, the airlines need to adapt to the regulation by adapting their operations and implementing biofuels. As the airlines adapt to the regulation and implement biofuels, the cost of fuels will have increased by five times the original cost. Furthermore, the change to biofuel also requires adaptations of the airplanes itself to run on said fuels, while also changes in their supply chain to obtain the fuels. As KLM stated, who are the first in the airline industry to have started production of biofuels, there is a scarcity of biofuels which might drive up the prices even further as demand will increase. Due to the costs increasing for the airlines to fund the adaptation of the sustainability regulations, the statement was made that the increased costs will need to be split between airlines and consumers. This means that the ticket prices for the consumers will increase.

Reaction:

The literature has explored the price increase for consumers as a result of the adaptation to biofuels to reach the government sustainability goal. So, what will the reaction be to this change? The consumer choice theory, price sensitivity, and the price sensitivity on sustainability changes has laid the foundation of knowledge in what the reaction might be from the consumer side. The consumer choice of mode of transport will help to understand and define if the change to sustainable operations of the airlines will result in the strengthened competitive position as the government is expecting, or not.

The literature on consumer choice suggests that income and budget ultimately define a consumers' range of choice and within the field of transport, the price of the transport plays a significant role in the consumers choice. Their price sensitivity shows to what extent they are willing to pay the increased price which is estimated to lie around a ten percent increase for price increases for sustainable goods and services. The literature examines how the consumer characteristics can influence their price sensitivity, as it states that characteristics such as higher education, young age, female gender and average to high income makes consumers less sensitive to price increases of sustainability adaptations. The consumer characteristics, according to the literature, will influence a consumer's choice and willingness to pay a premium price for green options. Based on their willingness and capability of paying the increased ticket price of airlines, the consumers can choose to either support the airlines and

continue to use air transport or refuse to carry the costs of the sustainability innovations of the airlines and prefer to use other modes of transport.

Output:

Based on the literature review, it suggests that the consumers of the airline industry are sensitive to price changes even if it is related to sustainable innovations. The customers' price sensitivity and their preferred mode of transport after the implementation of biofuels of the airline industry will be measured through a survey, to see if this applies in this specific case. This will be conducted and investigated in the analysis. From the data of the survey, a conclusion can be made if the consumers choose to continue using air transport or other modes of transport. As the literature review states, the choice of the consumers influences the competitive position of the airline companies either positively or negatively. This will be tested through the models of Porter to analyze how the consumer choice will influence the competitive position of the airlines. With the data of the survey, the porter model will be used to analyze if the concluded customer choice will strengthen or weaken the competitive position of airline companies.

Chapter 5: Methodology and Philosophical Considerations

5.1 Philosophical Considerations

Before going into the methodological approach of the research and its framework, the philosophical considerations will need to be outlined. Philosophy of science aims to outline the science and how it should be perceived, as well as the reality of what the knowledge used in paper is. Ontology, epistemology and methodology are the branches of philosophy of science which help to answer questions about what constitutes reality and how to find the truth.

Ontology deals with the beliefs of reality and examines whether one or multiple realities has to be used in order to obtain knowledge and uncover the truth.

Epistemology outlines the knowledge, how it is used, how it came to be used as knowledge and how reliable this knowledge is. Finally, methodology describes the practices and the plan used in the research, obtaining the knowledge, reasoning behind the decisions made throughout the research as well as the argumentation for the methods used.

Following the onion model of Saunders, Lewis and Thornhill (2009) the philosophy, and approach will be defined, and the strategy, choices of methods, time horizons and data collection will be discussed in the methodology.

Within this research, the author has used the pragmatic paradigm, which means that the reality cannot be understood or researched through one single methodology or theory, but a combination of methods is needed to uncover the truth and obtain new knowledge. In turn the reality of the research cannot be interpreted by a single person. Due to the use of the belief systems of the pragmatic paradigm, the methodology supports the use of multiple or any theories and methods that support the research question. (Kivunja & Kuyini, 2017) This scientific approach was chosen in order to assess the competitive position of firms and examine its change of the airline; multiple aspects of the industry needed to be researched. The competitive rivalry and its intensity, the competitive advantage of the airlines as well as their performance. The competitive rivalry will be measured through the Porter's Five Forces model, the competitive advantage through Porter's competitive advantage model and the performance of the airlines through the change in consumer choice. Therefore, multiple theories were used in order to conclude on the competitive position of airlines.

To continue, the deductive approach was used in the research as the research explores the consequences of a phenomenon. The research found different cases and knowledge within the literature review to build the hypothesis of change in the consumer choice and competitive

position of airlines with the implementation of biofuels. This was tested with data obtained through surveys and the use of theories and secondary data. Afterwards, the findings were discussed to examine the findings and conclude on the influence the consumer choice has on the competitive position.

5.1.1 Ontology

The ontological view of the research helps to reflect on the reality on which the research is based. As the research is using the pragmatic approach, it accepts the fact that multiple realities exist, as there is the reality for the individual airline, the airline industry as a whole, the airlines operating in the danish air space or in Europe, which all can have different realities. Also, the reality of the consumers can differ depending on various factors. In this specific case, the combination of realities is used by combining methods.

To summarize, the author believes and accepts that the reality is unique and changing both from the perspective of the consumer, as well as the airlines. Airline decisions and the need to reach the sustainability goals might affect consumers choices and in return the consumer decisions will further affect the competitive advantage of the airlines. The truth and reality both from the perspective of the consumer and the airlines will be ever changing depending on many variables, therefore the knowledge obtained by the author will be interpreted as objectively as possible in order to create new knowledge.

5.1.2 Epistemology

The ontology assists us to understand that the reality is defined through different individuals or societies, and the reality can differ from individual to individual. It defines the scope of reality within the research. Based on this, using one specific method would not add value to the research, as it is important to understand the complexity of the different realities and consumer behavior and its effects on business. It is to be assumed that different views on the phenomenon of sustainability will differently affect the consumers, while airlines will be required to make changes independently of the subjective nature of the consumer views. Thus, the author views the consumer with an anti-positivist approach, which means that the author believes that the differences between each individual's reality perception (consumers), will have influence on the airline's competitive advantage.

5.2 Methodology

The strategy of the research was surveys, and this research strategy was chosen in order to obtain data on the consumer choice, their travel habits and how price changes influences their mode of transport. Surveys were chosen as it enabled the research to gather data in the given time period of as many respondents as possible. The goal was to obtain a minimum of hundred responses without specific requirements to whom, in attempt to obtain a representative sample. The research could have used interviews as well, however, only a limited number of interviews would have been able to be collected and the author decided this might not be representative of the population. The use of interviews could have enabled the research to obtain more in-depth data on the consumer choice, such as income, reason of travel, amongst other factors through open-ended questions. The chosen strategy of surveys has provided a limitation due to the closed-ended questions and restricted answer possibilities.

The methods chosen for this research, as mentioned in the philosophical approach, were mixed methods. The research uses multiple theories with qualitative and quantitative data to research the different aspects of the competitive position of airlines. The theories used are consumer choice theory, Porter's Five Forces and Porter's competitive advantage.

The time horizon or also called the time frame of the research, was cross-sectional as the data was obtained through surveys and based on statements that are true in this point in time but might change.

	Obtainment:	Purpose:
Primary Data	<ul style="list-style-type: none">Obtained through the survey conducted. The data is a collection of 121 responses of convenience samples released on online public platforms.	<ul style="list-style-type: none">To examine the consumer travel habits, their preferred mode of transport, green sensitivity and price sensitivityTo analyze if the consumer preferred mode of transport shifts with significant price increases
Secondary Data	<ul style="list-style-type: none">Obtained through various sources, airline webpages, airline cluster webpages, prior researchstatistical sources such as Statista and Statistik Denmark	<ul style="list-style-type: none">To map out the competitive intensity of the airline industry through P5FTo examine the airlines current competitive strategy, how it could alter with the adaptation of the sustainability goal and how this might affect them generally and independently.

Figure 6: obtainment and purpose of data. (Author's compilation)

Finally, the data that was used in this research was both primary data and secondary data. The primary data was obtained through surveys and was quantitative and the secondary data was obtained through the airlines and prior research which was predominantly quantitative data but also included qualitative data on transport.

The objective of the research is to examine how the governmental sustainability goals are affecting the competitive position of European airline companies operating in Danish airspace. In order to achieve this, the research will include the theories of Porter's Five Forces to examine the current competition of the airline industry, as well as how it would change with the implementation of the sustainability goals. Continuing, Porter's competitive advantage will be used to analyze how the adaptation of the sustainability goals could create a competitive advantage or disadvantage for the industry within the different scenarios and how their current competitive advantage might change. The data that will be used within the two Porter theories is secondary data, both quantitative and qualitative, obtained through the airlines' sustainability reports, airlines webpages and statistical sources such as Statista and Statistik Denmark.

Furthermore, as mentioned, a survey will be conducted in the analysis aimed at the customers of the airline companies operating in lands to examine if the customers would be willing to carry the cost of sustainable flying to further analyze how the said goals would influence the airlines' competitive position. This will be done using the consumer choice theory, to examine how the consumer choice might or might not shift their preferred mode of transport and to what extent their preferred mode of transport is air transport. Consumer choice is a part of consumer behavior theory, which was also considered, but it is more specific and based on their budget and their willingness to choose a certain product or service over the other. Consumer switching was also considered but that would eliminate the factor of price of their choices, while the knowledge of the literature review suggests that consumers are highly price sensitive and price oriented within the transport industry. Therefore, consumer choice theory will be used, and it will be supported through the survey. The survey will be aimed at any gender, age, income and education level respondent, in order to obtain the most accurate and representative results of the consumer choice.

The theory of Corporate Social Responsibility and Triple bottom Line could have been used in the research, to define how the industry can improve their sustainability and through which strategy. However, this would have led the research in a significantly different direction as in this specific case the industry does not necessarily have a choice if they wish to operate in the Danish market in the near future. Those theories were not chosen as they will not assist the research in examining the research objective or assist in filling the knowledge gap.



Figure 7: Research design (Author's compilation)

Thus, the research framework was set up as follows, as seen in figure 7, in order to reach the objective of the research. The literature review will assist the research to create a solid base with information on the industry, its current competitive position and its players in the danish in-lands routes and the sustainability goals as well as consumer choice and the role of consumers. Firstly, the analysis will examine the results of the survey, which is based on the demands and reaction of the customers of the industry, to measure if there is a shift in the consumer choice. The survey will be aimed to discover if consumers would prefer to fly with the airlines or prefer to take other forms of transport, their substitutes and why. The survey will assist to measure the shift in consumer choice and with that be able to outline if it can influence the performance of the airlines in the industry. Continuing on the pre-existing literature, the analysis will define the competition and its different factors considering the sustainability goals through the Porter's Five Forces, as well as Porter's competitive advantage to analyze if the sustainability goals can increase competitive advantage or if it gives a disadvantage and changes their current competitive advantage. The discussion will connect the information of the literature review together with the findings of the analysis, in order to see the changes in the competition of the airline industry and how this will affect their competitive position. As is mentioned in the literature review, the competitive position is defined by performance and competitive advantage according to Porter's methodology. The consumer choice of their preferred mode of transport influences their profit, market share and revenue and with that their performance. As consumers influence their performance, it can consequently have an effect on their competitive position. In order to look at the influence on the competitive position as a whole, Porter's five forces and Porter's competitive advantage are used in the analysis to determine the competitiveness of the industry and the change the biofuels might bring on their competitive advantage.

5.2.1 Limitations:

Throughout this research, there are multiple limitations that must be taken into account. One of the limitations is the influence of the COVID-19 pandemic that has influenced the traveling behavior of customers, as well as influenced the airlines capabilities to operate. This has affected the data of number of flights, transport, costs and growth among others. In order to overcome this limitation, the influence of COVID-19 on the data will be taken into account and data time period will be extended to have an overview of the information prior to the pandemic.

Furthermore, another limitation is the data and information available for the government released statement of green operating airlines. Since it got released on January 1st 2022, it is a new concept with limited to no peer reviewed scholar literature or research available on the matter yet. Therefore, the information and statements are obtained through the ‘‘Statsministeriet’’ homepage about the prime ministers’ sustainability goals and plans as well as political news articles about quoted statements made by the government and politicians. The research will take into mind that the information on the sustainability goals and strategy is limited, but in order to avoid biases and false information, it will solely use the information that is thus far released by the government and politicians.

To continue, another limitation that must be taken into consideration throughout the research is that it’s a new and ‘‘hot’’ topic where politicians, researchers and airlines are developing new knowledge, statements and information which may alter the currently available data and the outcome in the time the research is being conducted. In order to overcome this limitation, the research will have to stay updated of any new information and statements being released during the writing process in order to keep the research valuable and true to the current situation.

Lastly, as the research will be based on surveys, it needs to be considered that surveys can have limitations with the biasness or incompleteness of the answers. According to Krosnick (1991) surveys can be problematic concerning the satisficing of the answers. By taking this notion into account, it assists the author to be aware of the problematic satisficing of the answers in the survey and take it into account within the research. This is due to the fact that the respondents of the survey will be limited to the close ended questions and limited answers set out by the author.

5.2.2 Data collection and data analysis:

To explain the research approach further in depth, the data collection and the approach of analyzing the data will be explained. The data that will be used throughout this research will be obtained through various peer reviewed articles, within the literature review, government statements, data from airlines and transport within the Danish borders through statistical sources such as Statista and Denmark Statistik. Data on the competition will be found through previous literature, statistics and existing statements and predictions by the industry themselves. Information and data on the in-lands transport competition will also be obtained through literature and statistics on the competitors such as trains, buses and ferries. Furthermore, the research will obtain data through statistics, statements and available literature on the so far known strategies to adapt to the sustainability goals, and if and to what extent it would increase costs for both the airlines as well as the consumers.

Finally, the research will produce data obtained through a survey based on consumer choices and behavior regarding the sustainable changes of airlines. The survey will be used to create statistical data based on the answers. The aim for the survey is to reach over a hundred responses in order to have enough data to be valid for the research, and directed at different age groups, genders, and income levels in order to receive data from the different types of customers to make the best assumption about their choices.

In order to analyze the data and use in the research to reach the objective, the data will be used to conclude on the consumer choice as well as the theories of Porter's Five Forces and Porter's competitive advantage to outline and examine the current competitive position and the competitive strength of the industry to determine how the sustainability goals of the Danish government are influencing the competitive position of the airline industry. The secondary data of various airlines, such as Norwegian air, Ryanair, KLM and British airways will be used to examine the different approaches taken within the market to obtain competitive advantage.

Chapter 6: Analysis

The analysis will investigate the consumer choice through a survey conducted by the author, followed by the porter models to analyze the competition in the industry and how the implementation of biofuels could affect the competitive position.

6.1 Survey

The survey is divided into three parts, the characteristics of the respondents, their air travel frequency and habits, followed by their choices regarding the sustainability regulations of the airline industry. As discussed in the methodology, the target goal of respondents was a minimum of 100, and the survey obtained 121 responses. The survey can be considered representative in terms of gender, frequency of flying. However, in regard to the age of the respondents, the responses of the survey are skewed towards the age groups of 15-44. Thus, not representing the age group of 45-60+ fully. This might be due to the fact that the data has been obtained through online platforms. Due to this being a survey of convenience (no specific groups targeted for obtaining the sample), the data is not representative for the variables: employment and education. The survey was based on closed ended question about the respondents' characteristics, travel habits and their choices regarding preferred mode of transport and willingness to pay a premium price for sustainable adaptations. (Lavrakas, 2008)

6.1.1 Consumer Characteristics

The survey received 121 responses, whereof 91 are danish, 27 are from European origin outside of Denmark, and 3 are outside of Europe and considered international consumers. To put this in better perspective, 75,25% of respondents are of Danish nationality, 22,31% are European and 2,44% are international.

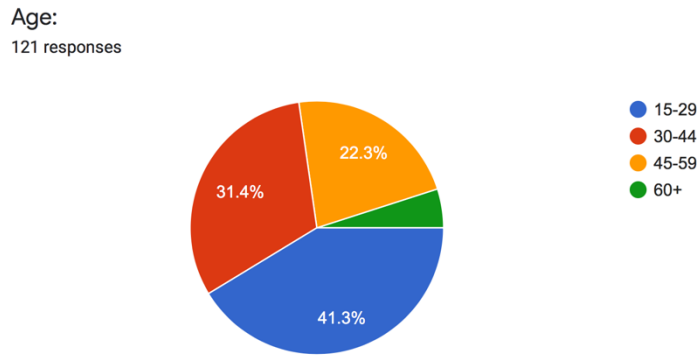


Figure 8: Respondents age. (Author's compilation)

The age group of the consumer was asked in order to evaluate which age group is most willing to pay the premium price or most sensitive to environmental issues. Figure 8 shows that most respondents, 41.3%, are from the age group of 15-29, whereas 31.4% is between the ages of 30-44, 22.3% of respondents are between 45-59 and the remaining 5% is 60+. As mentioned in the literature review, the young age group is assumed to be most willing to pay increased prices for sustainable goods and services.

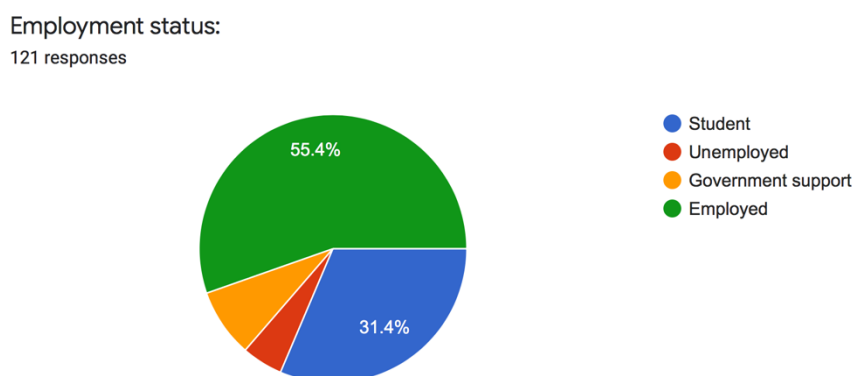


Figure 9: Employment status of respondents. (Author's compilation)

As shown in figure 9, the majority of the respondents are employed, 55.4% and considered average income. Whereas 31.4% are students and considered low income alike the remaining 13.2% who are either unemployed or on government support. Like the age characteristic data, the majority of the respondents are considered employed which is the employment status group that is most likely to be willing to pay the premium price for airline tickets according to the literature review.

Education status:
121 responses

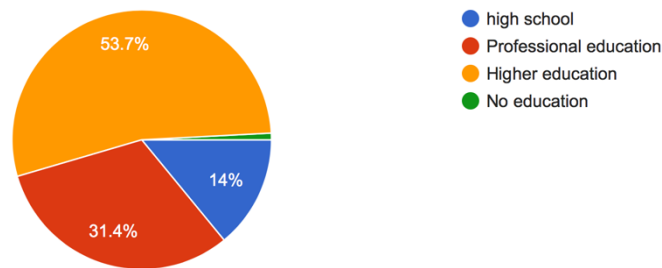


Figure 10: Education status of respondents. (Author's compilation)

Figure 10 depicts that most of the respondents, 53.7%, have obtained or are obtaining a higher education. 31.4% of respondents have obtained or are obtaining a professional education. 14% have obtained or are obtaining a high school education and 0.9% do not have an education. The literature has suggested that people that have obtained/are obtaining a higher education are more willing to pay the premium price.

In summary of the consumer characteristics, the majority of respondents are in the "young" age group of 15-29, are employed and have a higher education, which are the traits of the consumers that are most willing to pay the premium price. The gender of the respondents as shown in Appendix A, is 45.5% male and 54.5% female, so even though it can be said that most of the respondents are female, it is close to being an equal amount of male and female respondents, and therefore the argument will be made that the answers are representative for both genders equally. Based on the literature review, the majority of the respondents in this case have the characteristics that would assume they are willing to pay the premium price for sustainable flights.

6.1.2 Consumer Travel Habits

After having gathered data on the characteristics of the consumers, to know what type of respondents the data is based upon, it can be predicted based on the literature review that the consumers are willing to pay a premium price for sustainable air travel. In order to research the consumer choice further, data surrounding the travel habits of the respondents will need to be collected and analyzed.

How often do you use air travel (per year)?
121 responses

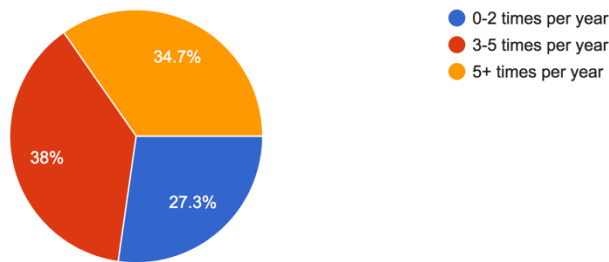


Figure 11: Air travel frequency of respondents. (Author's compilation)

The data of the survey shows that the respondents are divided in three groups with how often they use air travel in general. About 27.3% of respondents have limited air travel and only travel 0-2 times per year. 38% use air travel 3-5 times per year and the last group of respondents, 34.7% use air travel more than 5 times per year.

How often do you fly inlands in Denmark (per year)? For example from Copenhagen to Aalborg.
121 responses

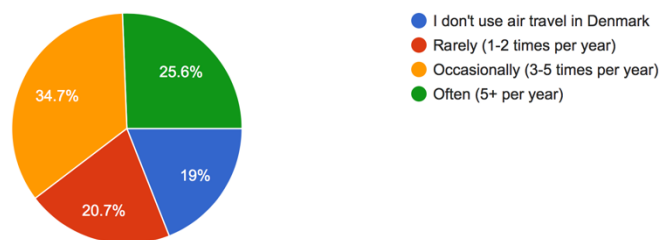


Figure 12: Air travel frequency in Denmark. (Author's compilation)

Figure 12 shows the frequency of the respondents' air travel habits. 19% of respondents do not use air travel within the Danish borders. 20.7% rarely uses air transport within Denmark and only fly about 1-2 times per year. 34.7% percent uses air transport within Denmark occasionally, about 3-5 times per year. 25.6 % of respondents use air travel frequently in Denmark and fly more than 5 times per year.

What is the main reason you choose air travel as mode of transport in Denmark?
121 responses

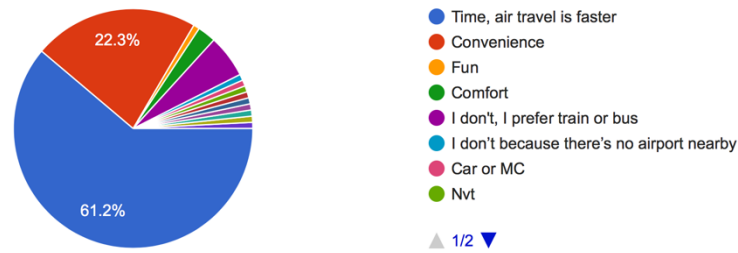


Figure 13: Respondents' motivation of choosing air transport in Denmark. (Author's compilation)

The respondents were asked what their reason for choosing air travel was, and the majority of the consumers, 61.2%, answered that the fact that air travel is the fastest mode of transport was their motivating reason to choose air transport. Whereas convenience was the second most chosen reason, with 22.3%. 5.8% stated that they prefer train or bus as a mode of transport over air transport. The remaining 10.7% of respondents were divided between fun, comfort, driving themselves or not having an airport nearby and thus not having easy access to air transport.

When booking flights, do you consider the Co2 impact and consciously choose green flight options?
120 responses

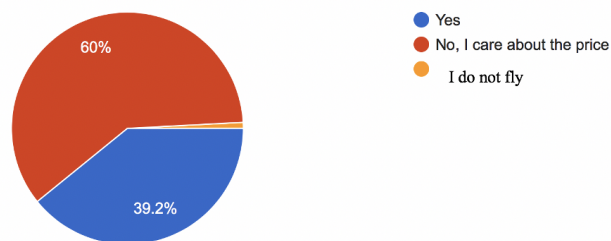


Figure 14: Respondents' green conscience and choice. (Author's compilation)

The respondents were asked if they consider the Co2 impact when using air transport and if they actively make green flight choices when booking flights. 60% of respondents stated that they do not actively consider the Co2 impact and are more concerned with the price of the transport. 39.2% stated that they are aware of the Co2 impact and attempt to choose greener flight options when choosing air travel. 0.8% stated that they never fly and thus do not consider the Co2 impact nor make green flight choices.

To summarize, the flight habits of the respondents show that the frequency of air transport amongst the respondents vary, also within Danish borders. The main motivation for their choice of air transport is the time, as it is the fastest transport option and its convenience. Furthermore, the majority of respondents have stated they care less for the Co2 impact of the air transport and are more concerned about the price. The last statement argues against the knowledge of the literature review, considering the majority is also higher education, employed and in the younger youth group, while being more concerned of the economical personal cost than the Co2 impact of the mode of transport.

6.1.3 Consumer Choice

After having collected data on the respondents' characteristics and air transport habits, it shows that the flight habits differ besides their motivation of flying, which the majority agreed on its time advantage. The respondents were also somewhat divided on if they take the Co2 impact in mind, with a split of approximately 60%-40%. Therefore, to investigate the consumer choice regarding the specific situation in Denmark with the implementation of biofuels and its consequences of pricing, the respondents were informed about the situation and asked what their choice would be in said circumstances.

Would you be willing to pay an additional fee of 50 kr on the normal flight costs to decrease your flights Co2 foot print? This fee would not cover th... costs originating from the necessary innovations.
121 responses

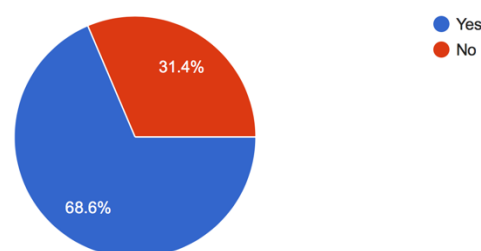


Figure 15: Consumers' willingness to pay additional fee for Co2 decreasing innovations.
(Author's compilation)

As figure 15 shows, the respondents were asked if they were willing to pay an additional 50 kr fee on top of their ticket price in order to support the necessary innovation of airlines to decrease Co2. Whereas 68.6% of respondents stated that they are willing to pay the additional 50 kr to support Co2 decreasing innovations to decrease their Co2 footprint. The fact that the majority of respondents are willing to pay this additional fee, supports the literature review,

where certain consumers are seemingly willing to pay a price increase of approximately 10%. However, 31.4% of respondents have stated that they are not willing to pay the additional fee.

When airplanes fly on biofuels, the costs will increase by 5x according to the Danish government and the airline industry. Would you be willing to pay...times the usual price) to fly nationally in Denmark?
119 responses

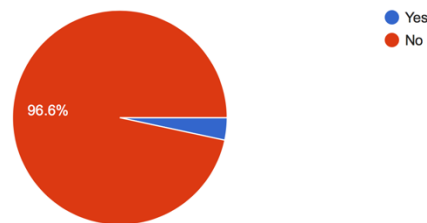


Figure 16: Respondents' willingness to pay the increased ticket price when operating on biofuels. (Author's compilation)

The respondents were asked about their willingness to pay the ticket price increase when airlines operate on biofuels and must split the costs with their consumers. The vast majority of respondents, 96.6%, stated no, they are not willing to pay for air transport with the price increase. The remaining 3.4% stated that they are willing to pay the price increase when airlines operate on biofuels.

If the prices of inlands flying in Denmark would increase to such an extent, would you still use air travel or consider other options such as bus, train or car? Choose all options you would consider
121 responses

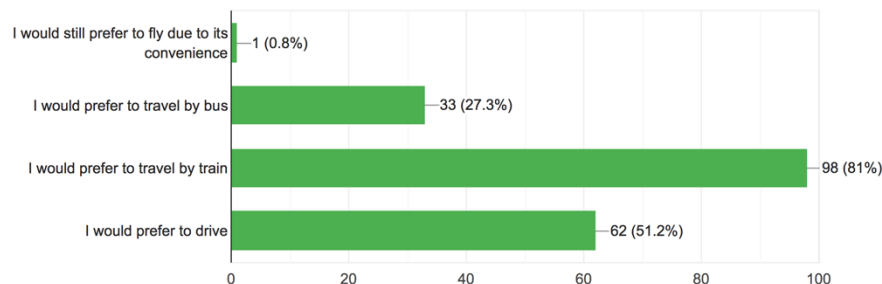


Figure 17: Choice of mode of transport when airlines operate on biofuels. (Author's compilation)

The respondents were asked what their preferred mode of transport would be when the prices would increase when airlines would operate on biofuels. Only 0.8% of respondents would still choose air transport as mode of transport in Denmark. 27.3% would choose taking the bus, 51.2% would choose to drive themselves and the majority would choose to take the train, 81%. The respondents were able to choose more than one option, however the statistics

shows that only one respondent would still be willing to fly. This person was contacted to understand the choice of continuing to fly, where the respondent stated that their flight costs were covered by their employer, and therefore the costs of flying does not affect their choice of transport.

What is the maximum you would be willing to spend on a flight ticket to fly in lands in Denmark?
121 responses

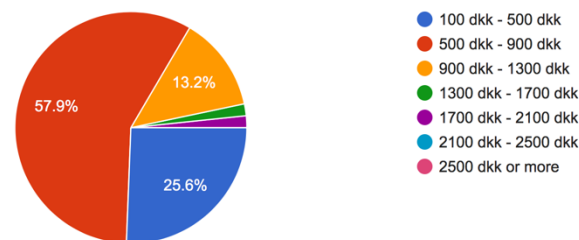


Figure 18: The budget that the respondents are willing to spend on air transport in Denmark.
(Author's compilation)

The data is showing that the consumers are overall not willing to pay the assumed price increase and would prefer other modes of transport. Thus, the respondents were asked what their budget limit would be to spend on air travel in Denmark per ticket. As shown in figure 18, the majority of respondents, 57.9% stated that their budget is between 500-900 dkk per ticket. Followed by 25.6% of respondents who state that they are willing to spend 100-500 dkk per ticket. 13.2%

6.2 Porter's Five Forces

In order to measure the change in competitive position of the airline industry, an outline of the competitive field is needed. Porter's Five Forces will be used in order to outline the competitive factors and the intensity of competition. The model of porters is divided in five sectors to analyze the different forces influencing the competition of the industry. (Bruijl, 2018) (Porter, 1979).

The first sector is competitive rivalry. As mentioned in the literature review, the airline industry has a high differentiation in prices of their flights based on the timing of the sales of the tickets and the destination of the flight. There are several different airlines operating within

the Danish national borders, such as SAS, DAT, AlsieExpress, KLM, Norwegian Air, LuftHansa, British Airways, RyanAir and Air France, who are competing in the Danish in-land's routes. The different airlines operating within the Danish borders offer flights at different price ranges, times, destinations, and add-on services such as a meal on board or extra luggage. The airlines, as also mentioned in the literature review, use different strategies surrounding sustainability and differentiation focused, such as RyanAir with the cheapest flights or KLM with the most sustainable and comfortable flights to mention a few. This wide range of variety to choose from within a flight transport, gives the consumer various options to choose from depending on what they value or deem important on a flight. Figure 18 shows the leading airlines in Europe (operating within Danish borders as well) based on number of passengers. With Ryanair Group, Easyjet and LuftHansa leading in the top, which are UK and Germany based airlines.

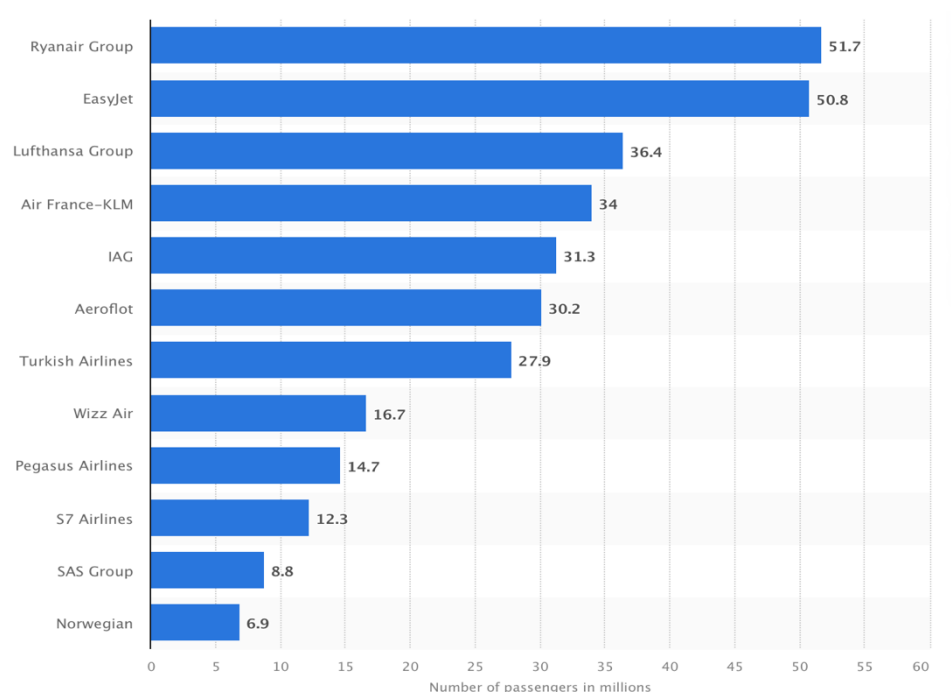


Figure 19: Leading airlines in Europe, based on passengers. (Statista, 2020)

Since there are many airlines operating within the competitive field at different price ranges and various offers, it can be said according to Porter's model that the competition between rivalry of the airline industry is strong with a few major players dominating the market as shown in figure 19.

The second sector looks into the threat of potential new entrants, which analyzed the barrier of entry for newcomers. The barriers of entry for the airline industry are high, where cost plays a large role in hindering new entries. The cost of a fleet ranges from a small plane

of 11 million dollars to a Boeing 777 of around 320 million dollars, which without a significant starting capital is a large cost that can be difficult to bring up when entering the airline industry (Evans, 2017). Furthermore, according to Mouawad (2012), one of the largest costs for airlines is fuel, making up about 50 percent of their costs. This statement was made back in 2012 and with the current prices of fuel it can be assumed to be even higher. Without a significant budget or financial strategies, it can be complicated for startups to navigate through the fluctuating fuel prices (Evans, 2017). Mergers have also taken place between smaller airlines in an attempt to dominate certain powerful airports to avoid competing head-to-head with the larger players (Mouawad, 2012). To continue, the competition can be quite fierce at larger airports that for new entrants it can be a barrier to access gates in order to operate (Evans, 2017). As also mentioned in the literature review, government regulations also create a barrier of entry within the airline industry. An example of regulations besides the sustainable demands, are mandatory compensations, notices and handling delays which costs approximately over 1.5 billion dollars annually for the industry as a whole to comply with (Evans, 2017). Lastly, high qualified staff is required, in this case pilots and engineers, to operate the aircrafts and, according to Carey (2014), there is a shortage of pilots in the market and they prefer well established airlines. All these different barriers to entry; high cost of aircrafts and fuel, strong competition and difficulty in access, governmental regulations and need of highly qualified staff of which there is a shortage, makes it difficult for new entries to enter the airline industry.

The third sector is the bargaining power of suppliers which looks into the strength and position of suppliers to control cost and prices in the competitive field. The three main needs of an airline, fuel, aircrafts and staff are influenced by external factors. As mentioned previously, one of the highest costs to operate for airlines is their cost of fuel and the price of fuel is determined by the fluctuating global market of oil. The aircrafts that the airlines need in order to operate come from two suppliers, either Boeing or Airbus. And finally, the need for limited available trained staff has support by unions. This means that the bargaining power of suppliers in the airline industry is very strong. (Juneja, 2015) To continue, as mentioned in the literature review, KLM has discussed the issue of changing to biofuels due to the scarcity of the fuel, its high cost as well as the steep increase in price it may experience and its increased demand when it is required to use. This indicates that the supplier power would increase more when the airlines are demanded to change to biofuel.

The fourth sector is looking into the bargaining power of buyers, meaning the influence that the buyers have on the pricing and cost. As there are airlines present in the market that carry low-cost fares such as RyanAir, it has resulted in intensified price wars which benefit the

consumers. Consumers also have access to different platforms to purchase tickets to determine the cheapest fares through different channels. With this in mind, the easier access for tickets dropped the need for intermediaries to purchase tickets which gave the consumers more freedom to select the cheapest tickets without intermediary costs. Finally, the buyers also have the favor of the protection of regulators. (Juneja, 2015) Combining these factors shows that there is a medium to high bargaining power of buyers.

The final and fifth sector is the threat of substitute products or services, which in this case would mean other forms of in-land passenger transport. In Denmark, but also in Europe overall, the public transport connections are highly functioning with differentiation in prices, duration and destinations, for both short and long travels. Keeping the focus on in-land transport, the train, bus, ferry and automobiles are close substitutes to the airline industry. According to Rallis, Meulengracht and Vilfoh (1984), for long distance travel, often between Copenhagen to Aalborg, Aarhus, or Odense, there are multiple options for the public. This includes train transport, where DSB is the only long-distance train company in the market. There are other train companies in the market, such as Arriva Denmark, Lokaltog, Nordjyske Jernbaner, öresundståg and Statens Järnvägar, who operate within specific regions or international routes. In figure 19, the network managed by BaneStyrelsen, DSB, shows the highest number of passengers compared to the other rail networks. Once again taking COVID-19 in mind, the national railroad travels within the same routes as the airlines have approximately 35,000 passengers as an average which is 14% of the passenger average of the airlines.

Rail transport of passengers

Unit: 1000 passagerer | Type of transport:

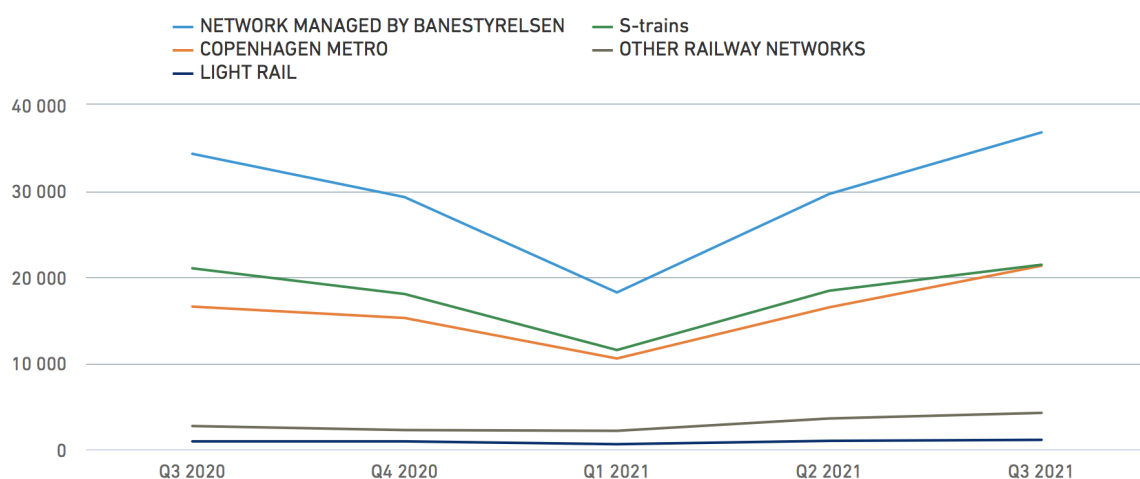


Figure 20: Railroad transport in Denmark. (Statistik Denmark, 2021)

Another substitute competitor within the industry offering the same routes is the Danish ferry transport. It offers transport from Aalborg, Aarhus, Odense and Copenhagen, which are also the most frequently flown routes (Statistik Denmark, 2021). The ferry offers people with a vehicle crossing over the waters to their destination. As can be seen in figure 21, the average of passengers traveling nationally long distance by ferry is 1,400,000. This is significantly more than either rail transport or air transport.

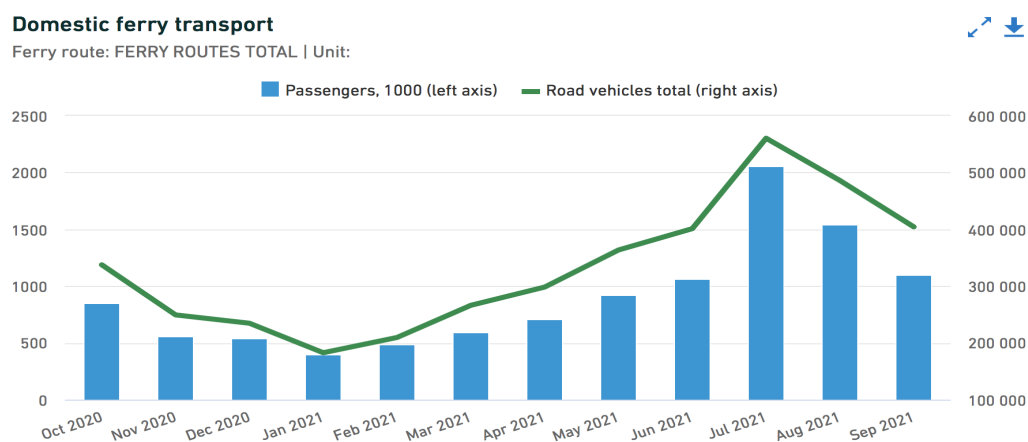


Figure 21: Danish Domestic Ferry Transport (Statistik Denmark, 2021)

Besides air travel, rail travel and travel by vehicle and ferry, the public can also choose transport by bus. Long distance bus transport is offered by Kombardoexpressen and Flexbus, as well as connecting NT bus routes. In general, traveling long distances by bus is the most affordable option for the public, followed by the ferry (not taking private vehicle costs into calculation). The cost of the train and flights are most expensive, but the prices vary depending on the advance and the time of the travel. Air travel is the fastest route in comparison to the other options of travel but depending on the destination and location of departure as well as the time it takes to board and exit the airplane. To summarize, the different forms of long-distance travel within Denmark are available to the public at different price ranges and duration of transport, where depending on the passengers' demand and needs might be desired over the other.

As there are numerous close substitutes to the airline industry, it can be said that the threat of substitutes is high according to Porter's Five forces methodology.

The different factors influence the competition and are playing a significant role in making it a highly competitive field. With high buyer and supplier power, strong competitive rivalry, high threat of substitutes creates a highly competitive environment for the airline industry. The threat of new entry within the airline industry however is rather low, even though there aren't necessarily strong restrictions that prohibit new entrants, the costs to entry are immensely high among other barriers. However, this factor being low risk has little influence on the high competition within the industry. Considering the increase of prices due to the implementation of biofuels, the supplier power and rivalry can increase. With increased supplier power due to biofuels and intensity from buyer power could tighten the flexibility of the industry of both sides putting them in a strained position with limitation on competitive freedom. In conclusion, the competition in the airline industry is high and the government regulation of implementing biofuels could amplify the intensity of competition.

6.3 Porter's competitive advantage

After having analyzed the competitiveness of the airline industry, the competitive advantage will be looked at. As mentioned, performance and competitive advantage defines a firm's competitive position. By looking at the competitive advantage that the airlines might obtain with the adaptation to biofuel, it helps to understand their competitive position. As mentioned, the competitiveness is considered high according to Porter's methodology and the fierce competitiveness within the airline industry drives the players to find ways to gain a competitive advantage over its rivals. A competitive advantage can either be sustainable, also called long term advantage, or a short-term competitive advantage. By looking at Porter's framework of competitive advantage, there are four ways to achieve a competitive advantage.

		COMPETITIVE ADVANTAGE	
		Lower Cost	Differentiation
COMPETITIVE SCOPE	Broad Target	1. Cost Leadership	2. Differentiation
	Narrow Target	3A. Cost Focus	3B. Differentiation Focus

Figure 22: Porter's model of generic strategies (Porter, 1985)

Currently in the airline industry' competitive field, some leading airlines have chosen the cost leadership approach, by offering low fares to their customers. Taking Ryanair as an example, they are known for their low prices and low-cost flights, upholding the average lowest prices in comparison to other airlines in the industry. This approach has proven successful for Ryanair as they have been the fastest growing airline as well as dominating the market share of the aviation industry (Statista, 2020). Other airlines, such as Norwegian air, use the cost focus strategy by offering discount deals and memberships to students and the younger age group. This has helped Norwegian air gain more customers of their targeted youth segment. On the other hand, some airlines are attempting to differentiate by implementing sustainability goals and practices prior to the biofuel regulation. According to the ACI, more airlines such as KLM, British Airways and Norwegian air to mention a few, have in the past years increased their efforts to implement sustainability strategies in order to differentiate and target the demand of consumers for sustainable flights (ACI, 2019). The approach of increasing their sustainability falls under the differentiation strategy to obtain a competitive advantage.

	Strategy for obtaining and upkeeping competitive advantage	How will the implementation of biofuels affect the competitive advantage
Airline 1 - KLM	<ul style="list-style-type: none"> • Differentiation through sustainability changes 	<ul style="list-style-type: none"> • Own biofuel production to suppress costs • Chance to upkeep prices and increase cost advantage.
Airline 2 - Ryanair	<ul style="list-style-type: none"> • Cost leadership • Low prices • differentiation through sustainability leadership goals (not compatible with the biofuel demand) 	<ul style="list-style-type: none"> • Decreased competitive advantage due to increase in costs • Increase in ticket prices → loss of cost competitive advantage • Generic sustainability focus with implementation of biofuels → loss of differentiation advantage
Airline 3 - Norwegian	<ul style="list-style-type: none"> • Differentiation focus through sustainability changes • Cost focused within target groups 	<ul style="list-style-type: none"> • Increase in ticket price → loss of cost competitive advantage • Generic sustainability focus with implementation of biofuels → loss of differentiation advantage

Figure 23: overview of different competitive strategies of airlines. (Author's compilation)

By looking at figure 23, it depicts the different strategies for obtaining/upkeeping their competitive advantage of different airlines. The figure shows the different competitive strategies of KLM, Ryanair, Norwegian as well as how this might result in different outcomes

regarding to the effect of biofuels on the competitive advantage. KLM uses the differentiation competitive strategy through implementing sustainable innovations and efforts. One of their current sustainable efforts includes the establishment of their own biofuel production facility. Based on this fact, it might be argued that KLM will be less affected by the cost increase of implementing biofuels due to their own supply. This enables them to be in more control of their costs and expenses and could enable them to keep offering fluctuating prices to their customers. This could give KLM a competitive advantage in comparison to their competitors in relation to costs and price differentiation. Another example of a different competitive strategy is that of Ryanair, who uses the approach of cost leadership by offering low prices to their consumers, and since very recently have started to focus on sustainability as well alike its competitors. Ryanair is currently changing its focus from offering low fares as their marketing point to being the “leading airline in sustainable flights”, while low fares is still their main competitive advantage (Ryanair, 2022). It can be argued that Ryanair will lose its competitive advantage of being the leading low-price airline in Europe when the biofuels are being implemented and will increase their costs significantly. On top of that, the competitive advantage gained by focusing on differentiation through sustainable practices might decrease when it becomes a generic adapted strategy for the airlines operating in the Danish airspace and eventually Europe. The last example is that of Norwegian, who uses the differentiation approach combined with cost focus, by focusing on specific customer niches and green flight options. Norwegian offers certain customer groups, such as students or customers under 26, discounts and cheaper fares on their flight tickets (Norwegian, 2022). This, however, might change when costs increase and might not be able to offer discounts to the specific customer groups and with that lose their competitive advantage on this aspect. Also, alike Ryanair, they might lose their advantage of offering green flight options due to generalized green flight operations on biofuels.

Continuing on this, through the government demand of using biofuels in the airlines’ operations, it could shift the competitive advantage of firms. Thus far, since certain firms are differentiating through the adaptation of sustainability practices, it can give them an advantage in the market. However, if all airlines operating within a certain market are required to make sustainable adaptations with biofuels, it does not differentiate airlines to the same extent. This could mean that the airlines that had obtained a competitive advantage through differentiating with sustainability practices will lose their advantage in the market. Furthermore, with the implementation of biofuels, the costs of the airlines will significantly increase due the fact that fuel is about 50 percent of an airlines’ cost, and the price of biofuels is approximately five times the amount of normal fossil fuels, as mentioned in the literature review. This could mean, by

looking at Porter's model, that the cost advantage would diminish for airlines, as they cannot offer tickets at the same low prices as before the use of biofuels. Through Porter's methodology, it would mean that this would result in a shift and assumingly a decrease in competitive advantage for the majority of airlines. It can also be said that the competitive advantage of airlines would overall decrease with the implementation of biofuels due to the cost increase. As the cost of fuel increases, the price of tickets also increases as mentioned in the literature review. The price increase of airlines would give the airlines a disadvantage in the competitive field in comparison to their substitutes such as bus and train transport. The price increases would also mean intensified price wars and less significant variation in price for consumers in the air transport segment.

All in all, it can be said that the current competitive advantages in the airline industry is made up between cost and differentiation strategies, which have proved successful. With the adoption of biofuels in the airline industry, it would give the airlines a disadvantage in the transport market amongst their substitutes due to the price increases. It would also shift the current competitive advantage of airlines due to the price increases and generalization of sustainable operations in the industry.

Chapter 7: Discussion

After having analyzed the survey, the competitive field of the airline industry and the competitive advantage of airlines prior to and with the use of biofuels, the results will be discussed to see how the consumer choice is changing with the implementation of biofuels in the airline industry and the influence this has on the airlines' competitive position.

7.1 Consumer choice

The analysis of the survey has shown that the preferred mode of transport shifted as the idea of biofuel and its increased costs were introduced. Prior to introducing the idea of biofuels and its consequence of increased ticket prices, 81 percent of respondents use air travel in Denmark yearly with only 5.8 percent of respondents preferring train or bus transport over air transport. About 83.5 percent answered that the main reason of air travel being their preferred mode of transport is due to the time it saves to get from A to B and its convenience. On top of that, about 60 percent of respondents answered that when it comes to flying, they do not consider the Co2 impact but are more conscious about the price of the tickets, and only 39.2% of respondents answered that they do consider the Co2 impact when flying. Comparing these results with the knowledge of the literature review, the results have proven to be different in this specific research. The literature review argued that consumers within a certain age group, income level and education level, but also in general are aware of the Co2 issue within the airline industry and would be willing to pay a premium price of up to 10 percent for increased sustainability. However, the majority of respondents fall within the categories and over 60 percent have responded that they care more about the pricing than the Co2 impact.

After having introduced the idea of biofuels and its consequential ticket price increase with the estimated amount according to the knowledge of the literature review, 68.6 percent of respondents would be willing to pay an additional fee of 50 danish krone to support sustainability innovations. However, almost all, 96.6 percent, of respondents answered that they are not willing to pay the expected price increase on flight tickets. On top of that, only 0.8 percent of respondents would still choose air travel as their preferred transport mode. The other 99.2 percent would prefer to travel by train, bus or car. This shows a strong shift in the consumer choice, from air transport being the preferred mode to travel, to it being the least preferred mode to travel, with the shift being from 83.5 percent to 0.8 percent of respondents who prefer air travel. The maximum on average that the consumers are willing to pay is 500-900 DKK according to the survey, which is far below the expected price when operating on

biofuels. The data has shown that consumers of air travel are very sensitive to price fluctuations and price oriented when choosing air travel, especially with steep price increases as predicted by the airlines and government when using biofuels.

With the drastic change of the consumer choice from air travel being the preferred mode of transport to it being the least preferred mode of transport to travel long distances in Denmark, it can be argued that regardless of age, gender, income and education groups, the consumers are not willing to pay the price increase. Due to consumer choice, people choosing bundles of goods, if the price of tickets increases significantly, they will be unable to buy other goods, changing their marginal utility. As it has shown that consumers drop the choice of airplane tickets as it's either above their budget or has decreased their marginal utility, and therefore prefer another option, such as taking the train, as it strains less on their budget and leaves options to buy other things too to increase utility. The data from the analysis have proven within this research that the consumer choice changes from air travel to its competitive substitutes such as trains/buses/cars.

7.2 Competitive position

To recall the conceptualization framework, if the consumer choice shifts then it might have a negative impact on the competitive position of airline companies. The methodology of Porters and the literature review will be used to discuss if such consequences are at play in this case with the concluded shift of the consumer choice.

As Porter states, the competitive position is defined by the competitive advantage and their performance. Currently the airlines are using both cost and differentiation strategy and with that certain airlines have obtained a competitive advantage. Their current competitive advantage deems important in the strong competitive field of the airline industry, and especially cost strategy have shown to have given great advantage to firms such as Ryanair. This can be seen as the airlines that offer low prices and price variety have the largest market share in the European market.

However, as the airlines are working towards a future based on biofuels, and the European governments are sharing this goal for the near future, it is important to investigate how this might affect the airlines if no government funding is offered. Since Denmark is the first European country to make the goal a reality already in 2025, it is used as an example to discuss how this will impact airlines operating in Denmark, and also might impact airlines on a more international level when the goal is set for the rest of Europe as stated in the literature

review. Taking in mind the highly competitive field of the airline industry as is being shown in the analysis, having a competitive advantage and a flow of customers is important for airlines to stay competitive in the market. As the analysis suggests, with the implementation of biofuels and its consequential cost increase, airlines might lose the ability for low-cost strategies and be forced to significantly up their prices to cover the cost. This would give a shift in their advantage strategies and could result in a competitive disadvantage instead. Combining this knowledge with the previously mentioned fact of it being a highly competitive field, with high buyer and supplier power, it gives the airlines little room to decide the pricing themselves. Also, the advantage of differentiation would be limited if all airlines would be operating sustainably due to the biofuels and would make the differentiation strategy of sustainability more generic, losing its advantage. This would mean that airlines are put in a position where new ways of gaining competitive advantage would need to be used.

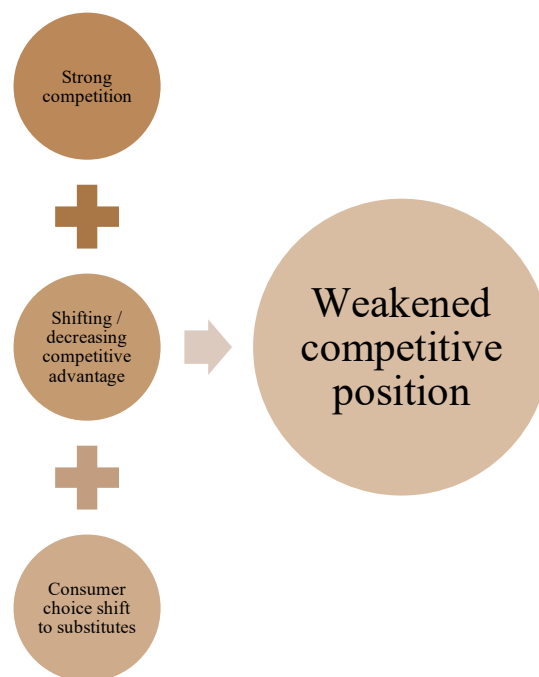


Figure 24: Competitive position of airlines in the airline industry operating in-lands in Denmark. (Author's compilation)

The change in consumer choice from airlines as preferred mode of transport to its substitutes, means that airlines could experience a significant drop in sales while operating on biofuels. The performance of a firm is defined by a firms' revenue, market share and profitability according to Porter's methodology. Taking this in mind, if airlines experience a

drop in sales due to the shift of consumer choice, it will decrease their revenue and profitability as well as a drop in market share. With the highly competitive industry and shifting of the airlines' competitive advantage, it would complicate the competitive strength of the airlines to regain their market share. By looking at figure 23, it shows how the combination of a highly competitive industry, weakened competitive advantage (competitive disadvantage) and the consumer choice shift to substitutes would negatively affect a firm's performance and with that create a weakened competitive position for the airline industry.

Chapter 8: Conclusion

In order to conclude on the research, the sub questions will have to be answered first. The first sub question is ‘‘What are the adaptations expected of the airline industry in order to comply with the sustainability goals of the Danish government?’’. This question lays the foundation of knowledge to understand the changes within the airlines’ operations that are expected of the government, in order to understand where changes in consumer choice and competitiveness are based upon. The airline industry and the European governments have over the years established certain goals for the airline industry in order to decrease their Co2 outputs and work towards a greener future. One of these goals that the governments and airline industry share is to work towards aviation operations on biofuels, and the goal is set for 2050 with some airlines aiming for even earlier such as 2030 as mentioned in the literature review. However, the Danish government announced on January 1st, that they have moved this goal to 2025, and stated that the airlines operating in-lands in Denmark should aim to operate on biofuels by this time. The government pushed this goal even further and hopes to achieve Co2 neutrality by 2030 and wish to be the head runners of Europe within sustainability in the airline industry. In order for the airlines to comply with the new regulations and goals of the Danish government, they are required to change their operations from fuels to biofuels accordingly. This change seems easier than it will be in reality, as for some airlines this means new engines that can function on biofuels or in some cases new aircrafts. On top of that, the cost of biofuels is estimated to be five times the cost of normal fuels due to its scarcity and limited production. The cost increase for airlines might influence the airlines even more to change further aspects within their business model such as prices, suppliers and technology amongst other things.

The following sub question focuses on the extent that the customer preferred mode of transport is defined by price alterations. As the literature review acknowledged, consumers within the airline industry are price sensitive. Complimentary, the data of the analysis has proven that consumers are highly price sensitive and price focused when making transport decisions and are not willing to pay a significant price increase to support sustainable change, as the literature originally suggested. Since consumers are highly price sensitive and price focused within their transport choices, the data of the survey showed that the consumer choice preferred mode of transport shifted when a price increase was introduced. This suggests that the consumer choice is highly influenced by price alterations when choosing the preferred mode of transport.

Lastly, how does the change of consumer choice of transport influence the airline industry's competitive position? The competitive position is influenced by competitive advantage and performance of a firm. The analysis has shown that the competitive advantage will decrease and shift when operating on biofuels, while the performance will be influenced by the shift in consumer choice to substitutes due to the decrease in profits and market share. When consumers choose the airline industry's substitutes such as train, bus or car, it will decrease the airline industry's market share and simulate their profit and revenue. Thus, the consumer choice is affecting the airline's performance and with that their competitive position.

After having answered the sub questions, the research question can be answered based on its foundation.

How are the Danish government sustainability goals regarding the airline industry affecting the consumer choice thus the competitive position of European airline companies operating in the Danish airspace?

As the government thus far has decided to not financially support the transition to biofuels or the cost of operating on said biofuels, the costs are expected to drastically increase for airlines as well as consumers. Based on the information of the analysis, it can be concluded that consumers will change their choice of transport to the airline's substitutes. This means that ultimately the goals of the government push the consumer choice to shift to substitutes due to their high price sensitivity within the transport section. Continuing, the shift in the consumer choice of preferred mode of transport negatively affects the performance of airlines in the industry. As the performance of airlines as well as their competitive advantage is negatively affected by the adaptations to the government goals, it negatively impacts the competitive position of the airlines operating in the Danish airspace. However, depending on the competitive strategy of the airlines, it can affect them differently. As the analysis has shown, KLM would be in the most advantageous position in comparison to its competitors as they have their own biofuel production. Ryanair, who is currently one of the leading airlines in Europe, would be strongly affected in a negative way as they would no longer be able to be low-cost and would lose their strong competitive position on the market. By taking these examples in mind, it can be said that generally the airlines will experience a loss in market share, decrease in revenue and profit and a decrease or loss of competitive advantage and an overall weakened competitive position. However, the airlines will be affected to different extents based on their competitive strategy.

8.1 Conceptual framework

To conclude on the research, the conceptual framework will be looked at again to conclude on how the literature review, theories, analysis and discussion are bound together and if it achieved the goal of the research. The goal of the research was to identify the consumer choice and if it would change with the government goal of biofuels for the airline industry, as well as identifying what effect it would have on the competitive position of the airline industry operating in the Danish airspace.

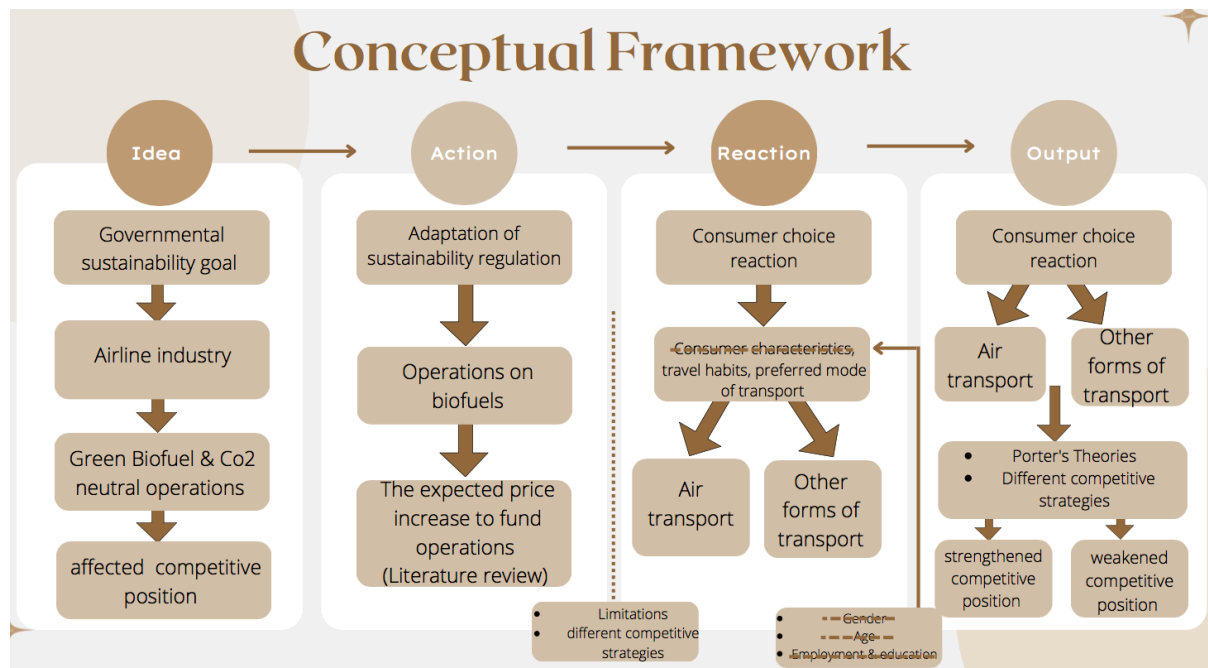


Figure 25: Adapted conceptual Framework. (Author's compilation)

The knowledge of the literature review laid the foundation of knowledge of what the governmental goals for the airline industry are, as well as knowledge on the consumer choice and how it is influenced by price changes, competitive position and the role of consumers, and the airline industry itself and how they adapt to regulations and the pressure of sustainability. Based on the knowledge of the literature review, certain statements were used to base the research upon, such as the expected price increase and the lack of government funding in this process.

Throughout the analysis, data was found through surveys to observe the change of the consumer choice when airlines would operate on biofuels as well as the theories of Porter's to measure the intensity of competition and observe the shift in competitive advantage with said biofuels. Through the analysis and discussion, it was concluded that the consumer choice of preferred transport shifts from flights to its substitutes of train, bus or car, and that there is a

high threat of switching. In comparison to the literature, the data of the survey found that the respondents characteristics such as age, gender and employment and education played little to no role in their choices in transport, but that the consumers base their choice on pricing. This can be concluded since regardless of their characteristics, nearly 100 percent of respondents were not willing to pay the increased price. By combining the knowledge of the literature and the findings in the analysis, it was concluded that through the shift of consumer choice, the high competitiveness of the industry and the decrease in competitive advantage would weaken the competitive position of the airlines within the industry operating in the Danish airspace. By looking at the conceptual framework, the analysis could have either shown no change in consumer choice and a strengthened competitive position or the concluded shift with the results of a weakened competitive position. The research achieved its objective through the conclusion on the consumer choice shift and its resulting change in competitive position.

8.2 Limitations and suggestions

Throughout the research, there were found multiple limitations in the research that affected its quality. One of the main limitations of the research is that it is based on goals for the future which still lacks development in its plan, as well as certain statements on the execution of the plan. If the goals or its execution changes, it would devalue the research. Statements such as the division of cost between airline and consumer were used to predict the consumer choice and the possible consequences it might have for the airlines. However, as these statements are for a future goal and did not actually happen yet, the research becomes hypothetical and might not be based on truth in the future as it might change. Another statement that the research is based upon is that Europe and the European airline industry carry the same goal as the Danish government has implemented but for further in the future. The research attempts to predict the consequences for the airlines operating within the danish airspace and how it could play out for Europe as well assuming no other strategy is taken.

This assumes that Europe and the European airlines also do not receive funding and also must split the costs and that the consumer has similar behavior when choosing transport. These assumptions, however, have multiple gaps. As it is both based on future goals which might change, as well as the implementation, funding, access to substitutional transport, distance, time, and culture influences which might influence the consumer choice and costs of biofuels for airlines amongst other factors. However, to simplify the research, these factors and

gaps were not included as it would be too broad but need to be taken into mind. Another factor that affects the quality of the research is that because it is based on assumptions and events that have not happened yet, it needs to be considered that the assumed weakened competitive position and the shift in consumer choice that is concluded upon in this research, is not permanent. With scarcity of a product such as biofuels, multiple manufacturers might enter the market and suppress the prices, changing supplier power and the cost of airlines. The market might adapt to the situation and change the consumer choice and competitive position accordingly. This research is based only on the statements and assumptions that are so far known, and the immediate result of the implementation of biofuels and not the market changes that might follow afterwards.

After having concluded on the research, certain suggestions can be made. When looking at the results from the competitive advantage analysis, it can be advised that airlines find alternative ways to gain a competitive advantage. KLM has started their own production of biofuels, with which they can both be cost efficient, differentiate and have a foot in the biofuel market. This is an example of changing strategies to avoid a hard hit in the costs and loss of advantage when implementing biofuels. Furthermore, it can be said based on this research that actively demanding government funding or alternative forms of funding to support the implementation process of biofuels is necessary for airlines.

Some suggestions for the improvement of the research can also be made. One of the main improvements to the research would be obtaining a fully representative survey sample or conducting open question interviews, both with consumers and airline representatives. Further in-depth data on the characteristics of the consumer, their purpose of traveling and their views on green transport could have improved the quality of the research in regard to the consumer choice and what drives their choices. Furthermore, the research could be continued and improved by acknowledging long term effects on the airlines due to the weakened competitive position, for example, more detailed outcomes of the effects for specific airlines. Since airlines would be affected to different extents, it would be valuable for the research to look further into depth of the different strategies and its output in terms of competitive position variations. Another suggestion to continue the research would be to examine how European airlines could upkeep a stable position in the market when adapting to biofuels and implementing the sustainability requirements, by for example possible changes in their business model and operations.

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Appendix

Appendix A

Gender:
121 responses

