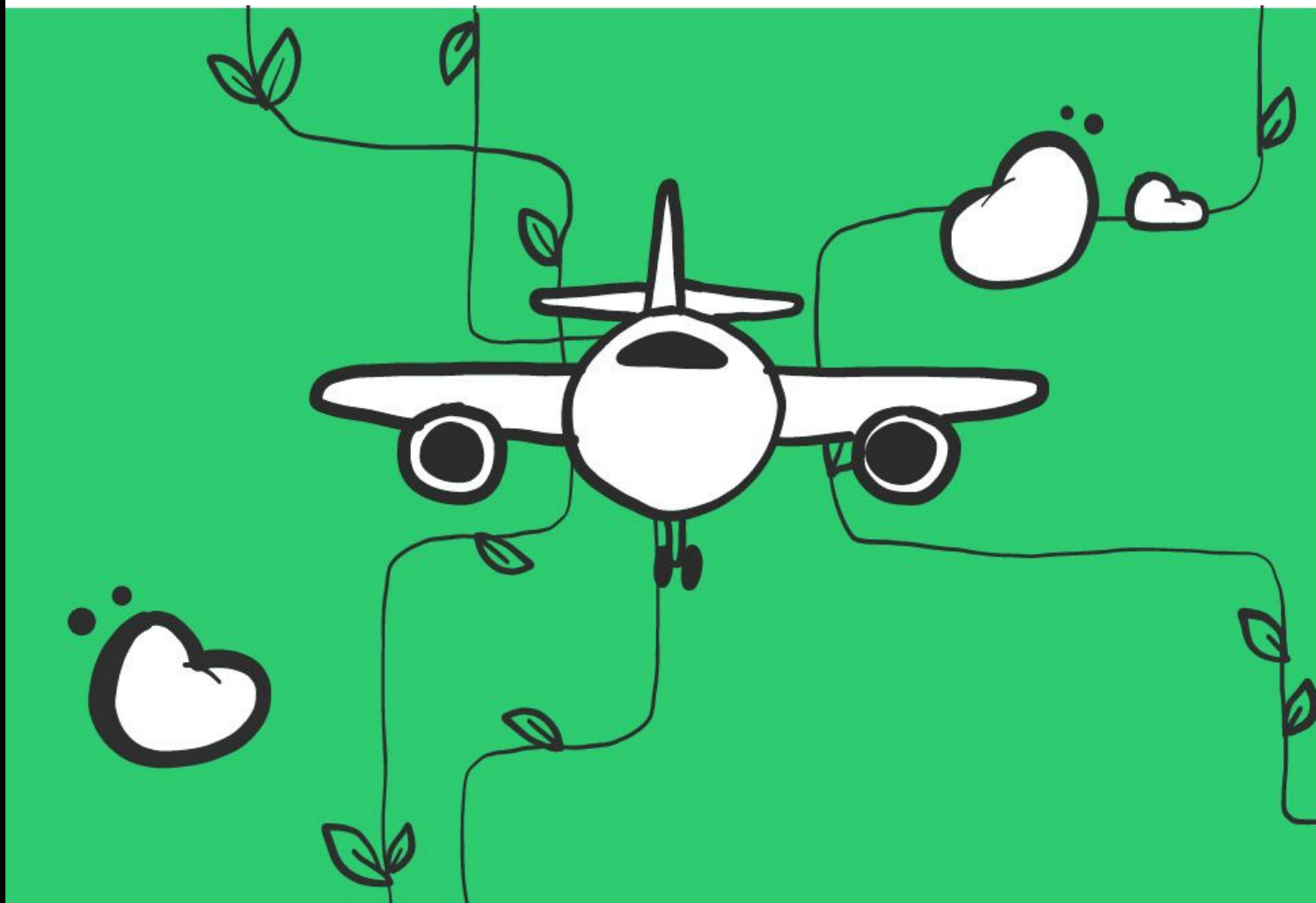


# Ready for a Green Take-Off?

An exploration of the role of airlines and air travellers in a transition towards sustainable aviation and how their interplay manifests in bio-fuel initiatives.



Emma Cuijpers - 940603166100  
MSc Leisure, Tourism & Environment  
MSc Thesis Environmental Policy Group  
Supervisor: Machiel Lamers

5th of July, 2019

I hereby declare that this thesis is fully my own and autonomous work. All sources and aids used have been indicated as such. All texts either quoted directly or paraphrased have been indicated by in-text citations. This work has not been submitted to any other examination authority. The report does not represent the position of Wageningen University on any matters.

*Illustrations cover-page and below by Jodi ten Bohmer, Yieldr: <https://blog.yieldr.com/airline-emissions-sustainability-infographic/>*

Utrecht, 05-07-2019,  
Emma Cuijpers



## Summary

Air travel is one of the most rapidly growing sectors hence scholars are expressing concerns when it comes to the contribution of flying to CO<sub>2</sub> emissions and its impact on climate change. In the last decade, the debate cultivated on how to limit the negative climate impact of flying. Many studies show the problematic insight that consumer changes in air travel are unlikely to happen but are in fact necessary for limiting emissions. On the other hand, the aviation industry has taken up the development of sustainable bio-fuels as a structural solution on the short-medium term. While both playing their part in the pressing need of mitigating emissions, airlines and consumers are at a point where they are both held responsible and have a definable influence on each other. This research therefore aims to explore the role of airlines and air travellers in a transition towards more sustainable aviation, and their interplay in bio-fuel initiatives. In existing literature, there is little focus on the interplay of both parties and the influence it has on a sustainable aviation transition. The concept of political consumerism through two practice approaches provides an opportunity to analyse the interrelations between airlines and air travellers, and the idea of political consumerism behaviour in air travel. A case study is employed, being the newly introduced Amsterdam-Växjö flight-route by KLM. This flight illustrates a sustainable aviation initiative based on bio-fuel. Interviews with main involved employees of KLM and representatives of Växjö as well as an air traveller survey provided the research with interesting insights.

The following main conclusions can be drawn. In general, air travellers perceive bio-fuel driven flights in a positive way and are supportive of such initiatives. Even the vast majority of respondents was open to adjust their air travel behaviour towards being more environmentally friendly. However, one of the most evident conclusions from the survey is that air travellers feel there is not enough information regarding bio-fuel and sustainable aviation being spread, and that airlines do not communicate sufficiently about sustainability efforts in general. Also, KLM employs a modest communication strategy on their environmental efforts and communicating about bio-fuel use for the Växjö-route is acknowledged as a gap. This way, the airline does not seem to facilitate political consumerism behaviour, which is actually seen as an opportunity as the research concludes that at least 42% of the respondents are positively inclined to make political consumerism choices in their air travel behaviour. This study thus adds the idea of a latent form of political consumerism for sustainable aviation to literature. Further, the meaning and construction of bio-fuel initiatives for sustainable aviation might not be clear to air travellers. These dynamics further show that the airline does not actively seek to engage consumers into making aviation more sustainable. This is a shortcoming as consumer support of sustainable flights would be necessary to push other airlines into similar efforts, which would increase the options of sustainable flights and make it easier for consumers to choose them. In a transition path towards a more sustainable aviation sector, this study concludes that a provider-led change process is at play, KLM is the initiator by offering a more sustainable flight even though the airline does not appear to engage travellers in supporting their efforts, and thus involve them in a sustainability transition.

## Preface

This thesis has been written as one of the final parts of my MSc in Leisure, Tourism & Environment at Wageningen University. It has been an extensive process which I would not be able to have fulfilled without guidance and support of other people, therefore I would like to take a moment to express my gratitude.

First of all, I would like to thank my thesis supervisor Machiel Lamers, whom helped me during the development of my thesis subject and has put me in touch with the relevant contact person. During the process of my thesis I have enjoyed our discussions and I highly appreciate the time that he put into our meetings and guidance.

I would also like to express my gratitude to all KLM employees whom made time for an interview with me and provided the research with the perspective of their organization. This research has gained a lot from their participation. Also, the interviews with the Växjö municipality and Växjö airport representative have been a great insight into the construction of a sustainable aviation initiative. Moreover, I would like to thank all the participants in the survey, even though there is a great change that they will not get to see this result.

Last but not least, I would very much like to thank my friends, boyfriend and family for their continuous support, comforting words and motivation to keep me going. This has been an extensive process, and without them I would not have been able to bring it to a successful end.

For now, I hope you enjoy reading this work and get something out of it, as it involves one of the most pressing and complex problems of this time. I am happy and proud to bring this chapter to an end.

# Table of Content

<b>SUMMARY .....</b>	<b>3</b>
<b>PREFACE .....</b>	<b>4</b>
<b>LIST OF TABLES AND FIGURES .....</b>	<b>6</b>
<b>1. CHECKING IN.....</b>	<b>7</b>
1.1 BACKGROUND AND PROBLEM DESCRIPTION .....	7
1.2 RESEARCH OBJECTIVE AND QUESTIONS.....	9
1.3 OUTLINE .....	9
<b>2. PRE-DEPARTURE .....</b>	<b>10</b>
<b>PART I .....</b>	<b>10</b>
2.1 IMPLICATIONS OF CONSUMER BEHAVIOUR, CLIMATE CHANGE AND AVIATION .....	10
2.2 AIRLINES DISCOURSES ON THEIR ROLE AND POLICIES .....	12
2.3 SUSTAINABLE JET BIOFUEL .....	14
<b>PART II .....</b>	<b>17</b>
2.4 POLITICAL CONSUMERISM: INTRODUCTION TO THE CONCEPT .....	17
2.5 POLITICAL CONSUMERISM IN RELATION TO TOURISM.....	18
2.6 POLITICAL CONSUMERISM AND AVIATION .....	19
2.7 WHAT DRIVES POLITICAL CONSUMERS?.....	19
2.8 PROVIDER & CONSUMER IN TRANSITION PATHS.....	22
2.9 SYNTHESIS OF THE FRAMEWORK .....	24
<b>3. TAKING OFF .....</b>	<b>26</b>
3.1 RESEARCH DESIGN.....	26
3.2 DATA COLLECTION.....	27
3.2.1 <i>In-depth interviews</i> .....	27
3.2.2 <i>Survey</i> .....	28
3.3 DATA ANALYSIS .....	29
3.3.1 <i>Interview Analysis</i> .....	29
3.3.2 <i>Survey Analysis</i> .....	30
3.4 LIMITATIONS RESEARCH DESIGN .....	30
3.5 POSITIONALITY, RELIABILITY, VALIDITY .....	31
<b>4. IN-FLIGHT .....</b>	<b>32</b>
4.1 SURVEY RESULTS .....	32
4.1.1 <i>Participant characteristics</i> .....	32
4.1.2 <i>Traveller perception of sustainable flight initiatives</i> .....	33
4.2 INTERVIEW RESULTS .....	39
4.2.1 <i>Project set-up</i> .....	39
4.2.2 <i>Communication &amp; Information issues</i> .....	41
4.2.3 <i>Discourse Aviation and Environment</i> .....	44
4.2.4 <i>Environmental commitment KLM</i> .....	45
4.2.5 <i>Traveller anticipations</i> .....	47
<b>5. TURBULENCE .....</b>	<b>51</b>
<b>6. LANDING .....</b>	<b>56</b>
6.1 CONCLUSIONS.....	56
6.2 RECOMMENDATIONS FUTURE RESEARCH .....	58
<b>LIST OF REFERENCES .....</b>	<b>59</b>
<b>APPENDICES.....</b>	<b>63</b>

APPENDIX 1: SUMMARY OF SCANDINAVIAN AIRLINES DRIVERS OF ENVIRONMENTAL MANAGEMENT.....	63
APPENDIX 2. INFOGRAPHIC IATA 10 YEARS OF FLYING WITH SUSTAINABLE AVIATION FUELS.....	64
APPENDIX 3. DATA COLLECTION INSTRUMENTS .....	65
3.1 Interview guide KLM.....	65
3.2 Interview guide Municipality + Airport Växjö.....	66
3.3 Survey .....	69
APPENDIX 4. SURVEY GRAPHS AND FIGURES .....	70

## List of Tables and Figures

**Figure 2.1** Main aspects of climate change policies for air travel external to tourists

**Figure 2.2** Projected aviation emissions over time (ATAG, 2017).

**Figure 2.3.** Model for political consumerism based on the ABC- framework (Scruggs et al., 2011)

**Figure 2.4a.** Information flows related to ‘direct’ and ‘indirect’ environmental impacts (Spaargaren & Van Koppen, 2009)

**Figure 2.4b.** Relative power of consumers and providers in influencing the (in)direct environmental impacts in production-consumption chains (Spaargaren & Koppen, 2009).

**Figure 2.5.** Two possible transition paths through which (citizen) consumers act as change agents (based on Verbeek & Mommaas, 2009).

**Figure 2.6** Conceptual framework.

**Figure 3.1** Timeline KLM’s main developments in bio-fuel flights (Fitzgerald, 2019).

**Table 3.2** List of interviewees with corresponding codes.

**Table 4.1:** Sample characteristics survey.

**Figure 4.2:** Traveller awareness KLM investing in bio-fuel.

**Figure 4.3:** Bio-fuel compelling factor in airline choice

**Figure 4.4** Weighted average for each of the statements.

**Figure 4.5** Information regarding bio-fuel.

**Figure 4.6** Airline communication about sustainability efforts.

**Figure 4.7** New variable political consumerism

**Figure 4.8** Environmentally conscious choices.

**Figure 4.8** Taking impact of flying more serious.



## 1. Checking in

*This chapter introduces the reader to the background of the topic and the identified problem in this field. The research objective and questions that have been formulated which will guide the research will be explained. Lastly, an overview of how this report is constructed is provided.*

### 1.1 Background and Problem description

Many scholars have expressed concerns when it comes to growing greenhouse gases such as carbon dioxide (CO<sub>2</sub>) and their effect on climate change. Climate change and its associated increase in temperature are at a dangerous level if temperatures rise over 2 °C since it can destabilize the climate system (Peeters & Dubois, 2010). Within this realm, air travel is widely discussed for its contribution to climate change through the high emissions of CO<sub>2</sub> by planes (Birgelen, Semeijn & Behrens, 2011). Flying is being criticized and seems especially problematic taking into account the substantial growth of tourism and air travel, which according to Peeters & Dubois (2010) will make up the whole global allowance of emissions by 2050. Gössling & Peeters (2015) highlight aviation's share in this problem by concluding when going on a holiday, to travel to and from a destination is the main contributor to climate change. Additionally, Gössling et al. (2012) refer to air travel as *"the most energy intense tourism sub-sector"* (p.36). Aviation is one of the most rapidly growing sectors and its emissions are projected to grow 3,6 to 6,2 fold by 2050 compared to 2010, which is significantly more than the 1,7 rate expected of the entire transport sector together (De Jong, 2018).

At the same time, literature grows around consumer awareness and behavioural change when it comes to climate change and air travel. Studies reveal that tourists do not even consider climate change when planning their holiday and the effectiveness of voluntary carbon offsetting schemes is being questioned (Verbeek & Mommaas, 2008; Higham et al. 2014; Davison et al. 2014;). The focus of many scholars here is to understand tourist behaviour towards air travel in order to be able to influence or change this behaviour (Birgelen et al. 2011; Barr & Prillwitz, 2012; Davison et al. 2014; Higham et al. 2014;). These papers refer to social and psychological barriers to behavioural change which are problematic for sustainable tourism or air travel choices. Davison, Littleford & Ryley (2014) describe the attitude-behaviour gap when explaining that especially in tourism, expressed pro-environmental attitudes of consumers are not reflected in their actual consumption behaviour. In particular, they mention that awareness and understanding of climate change does not cast back in consumer behaviour when it comes to transport considerations. Even if people show pro-environmental tourist behaviour by means of their holiday-package, to take a long-haul flight to get there forms a blind-spot and is often taken for granted (Lamers et al. 2018). Actually, even the greenest consumers appear to be the ones who are the most frequent and long-haul flyers (Böhler et al., 2006; Barr et al., 2010). This might be problematic as nowadays climate change is being conceptualized as a problem where mitigation lies with consumers and citizens (Barr & Prillwitz, 2012; McDonald et al. 2015). Thus, even though people do not act on

climate change in their flying behaviour, it seems that emission reduction does in fact rely on behavioural change of consumers as *“technological advances are unlikely to make a significant difference in the short term”* (Davison et al. 2014, p. 13).

International aviation is not included in any global climate agreements since the industries' related emissions are not allocated to any nation (De Jong, 2018). Therefore, industry organization such as ICAO (International Civil Aviation Organisation) and IATA (International Air Transport Association) have been free to draw up their own agreements and efforts. In the last years, there have been growing pro-environmental initiatives from different airlines themselves to reduce CO<sub>2</sub> emissions. For example, Scandinavian Airlines makes use of newer aircrafts of the right size suitable to passenger numbers which can reduce fuel consumption per passenger (SASgroup, 2018), which is however a relative efficiency improvement. Additionally, other companies such as TUIfly are investing in the sustainability of aircraft technology and design, as the introduced Boeing 737 MAX has a reduction in fuel consumption of 14% compared to their previous model (Van der Donk, 2018). Next to aircraft innovations, many airlines have introduced voluntary carbon offsetting schemes through which customers can pay an additional fee on their flight ticket to compensate for the resulting CO<sub>2</sub> emissions. Yet, the effectiveness of these have been questioned. For example, Higham et al. (2014) argue that convenience, costs and time-efficiency suppress climate concerns in tourist transport decision-making and Gössling et al. (2007) question the credibility and efficiency of these schemes.

Since fossil fuel is at the core of the emission problem, a promising innovation is the investment and commercialization of alternative aviation fuels coming from biomass (Hari, Yaakob & Binitha, 2014). Research concerning biofuels for aviation is expanding and De Jong (2018) finds that sustainable jet fuel is one of the main structural solutions to reduce emissions from the airline sector in the short-medium term. As the need for these bio-fuels has been recognized, various collaborations and projects are emerging around the globe including public and private programs with universities, institutes, private companies and governments (Hari et al. 2014). The use of bio-fuels for commercial air travel has taken off as IATA (2018) proudly presents that in 2018, over a 130.000 commercial flights using sustainable alternative fuels have been performed.

Thus, there seem to be growing efforts by airlines in order to mitigate CO<sub>2</sub> emissions and invest in sustainable aviation initiatives such as bio-fuel. Yet, consumers are claimed to be the ones able to make the real change for climate impacts by means of their air travel consumption. Many studies conversely show that pro-environmental behaviour is not reflected in travel choices and climate change awareness does not seem to affect actual flying behaviour. Little is known, about what happens when innovations like bio-fuel flights are being marketed and consumers are offered an option to fly more sustainable without tremendously changing behaviour. The influence of such sustainable aviation initiatives on consumers choices as well as their perception of more sustainable flights is an unexplored area.



Airlines are introducing sustainable bio-fuel flights, but consumers can potentially act on this via their consumption behaviour. While both playing their part in the pressing need of mitigating emissions, airlines and consumers are at a point where they are both held responsible and have a definable influence on each other. This research therefore aims to explore the role of airlines and air travellers in a transition towards sustainable aviation, and how their interplay manifests in bio-fuel initiatives.

## 1.2 Research objective and questions

The objective of this thesis is to explore the role of airlines and air travellers in a transition towards more sustainable aviation, and how their interplay manifests bio-fuel initiatives. The main research question thus can be formulated as followed:

*What is the role of airlines and air travellers in a transition towards a more sustainable aviation sector and how does their interplay manifest in bio-fuel initiatives?*

To answer the main research question, the following sub-questions have been drawn up.

- *What are the perceptions of air travellers towards bio-fuel driven flights, and how do these perceptions relate to pro-environmental consumer choices in air travel?*
- *What are industry anticipations of bio-fuel flights and to what extent do they correspond with actual consumer support of a current initiative?*
- *What is the interrelation between airlines and air travellers and how does this affect the process towards a more sustainable aviation industry?*

## 1.3 Outline

This thesis consists of six chapters which are named after the stages in a flight. Firstly, Checking-in introduces the research topic surrounding climate change, air travel and consumer interest which leads to the contextualized problem statement. Also, the research objective, main research questions and sub-questions are described which guide the thesis research. The next chapter, Pre-departure, exists of two parts. Part one entails the debates surrounding climate change mitigation in air travel and the implications of consumer behaviour and airline involvement. Part two represents the theoretical underpinning of this thesis and the analytical lens based on political consumerism. Taking Off explains the used research methodologies and analysis. After this, the findings are presented in the chapter 'In-Flight', where firstly the survey results are presented following an analysis of the in-depth interviews structured according to relevant themes. The chapter Turbulence represents the needed discussion of the findings as they are linked and references to literature are made in order to place the research in the relevant context. Lastly, 'Landing' brings the thesis to an end as the conclusions are drawn and recommendations for further research are given.



## 2. Pre-departure

*This chapter forms the foundation of this thesis in terms of literature and theoretical approach. The first section will lay-out the topics and issues which form the context of this thesis. Firstly, implications that surround consumer behaviour, climate change and aviation will be discussed. Following will be a reflection of how airlines seem to approach and communicate about their role in climate change. Lastly, bio-fuel for aviation will be shortly described as a development which aims to make aviation more sustainable. The second part, being the theoretical approach, will be introduced later on.*

### Part I

#### 2.1 Implications of Consumer Behaviour, Climate Change and Aviation

To start with, the concept of sustainable tourism received a lot of attention in the past decades. The United Nations defined sustainability goals which are to be met in 2030, of which three are in relation to tourism. Consequently, the World Tourism Organization (UNWTO) has set up the ‘Tourism for Sustainable Development Goals Platform’ in which tourism stakeholders are invited to get involved in the SDG implement strategies. Obviously, tourism is not anymore only being praised for its economic contribution or positive psychological effects on the individual, but concerns grow on its negative environmental impacts. The industry is making progress on the production of sustainable tourism, such as developing niche markets in eco-tourism, voluntourism or conservation tourism (Buckley, 2010). However, the associated transport thus especially air travel contribute highly to negative effects of global climate change (Higham et al., 2014). Lamers, Nawijn & Eijgelaar (2018) argue that especially consumers have a particular important role to play in facilitating change to more sustainable tourism, but progress on the consumption side seems challenging.

An expanding body of literature has investigated sustainable tourist behaviour or pro-environmental tourist behaviour. Many have found that even though consumers have positive attitudes towards sustainable tourism, not many behave accordingly or are willing to pay for sustainable packages, services and transportation (Becken, 2007; Budeanu, 2007; Barr & Prillwitz, 2012; Hall et al., 2013; Davison, 2014). These authors have mainly focused on explaining and understanding this attitude-behaviour gap as they feel this is needed for effectively initiating behavioural change.

While the attitude-behaviour gap is extensively written about and considered a given, the following authors have focused on people’s perception and attitude towards travel and climate change, in particular to air travel. Therefore these insights are relevant for understanding consumer behaviour implications in this field.

To begin with, Barr & Prillwitz (2012) found that climate change was considered less important to tackle in a holiday and leisure context than in daily travel behaviour. They relate this to cognitive dissonance as people express contradictory attitudes to climate change in daily life travel and holiday travel.

Additionally, behavioural change in a holiday setting is much less appreciated by consumers than in daily life as tourism is a *'fundamentally different consumption context, in which behavioural inversions can occur'* (Barr & Prillwitz, 2012, p. 807). This inconsistency between environmental conscious behaviour in everyday life and on holiday has been referred to as the home-away gap, in which tourism is seen as an escape from everyday life. In this sense, a context-specific approach or performativity perspective to tourist behaviour helps to explain that tourism is performed in a different context than 'home' and therefore behaviour is not consistent.

To make a specific connection to perceptions of aviation and climate change, Higham et al. (2014) performed a comparative analysis of attitudes of three European countries (Norway, UK and Germany) towards climate change and air travel. The authors refer to the "flyers' dilemma" brought into life by Rosenthal (2010), as a tension which arises in people as they experience personal benefits of rooted air travel behaviour but which at the same time brings the collective consequences of climate change. Even though people experience such contradictory feelings, the next step towards behavioural change in order to reduce emissions seems a bridge too far. The research finds that in the studied societies there is a high awareness of the connection between air travel and climate change and in fact deeply held consumer concerns. However, there was a profound unwillingness to make concessions in established air travel behaviour. Instead, *"convenience efficiency (time), and cost competitiveness were commonly identified as the key determinants of behaviour, allowing climate concerns to be suppressed or disregarded entirely in consumer decision making"* (Higham et al. 2014, p. 472).

To build on consumer perception of aviation and climate change the following article provides more detailed insight into the opinion of travellers and their held beliefs. Becken (2007) studied tourists awareness and knowledge regarding aviation and climate change, the sense of personal responsibility and their reaction to related climate change policies. The study finds that knowledge, awareness, responsibility as a tourist, and individual feelings of responsibility are internal factors that influence perception on climate change. Participants of this study expressed they feel that responsibility to tackle climate change impacts resulting from air travel lies with governments and international organizations. When it comes to their own behaviour in terms of mitigating negative environmental effects, few links and acknowledgements were made. Furthermore, the research found that tourists view airlines as only being economically affected by climate change policies. The main aspects of climate change and air travel in the external environment has been identified by the respondents and is visualized in figure 2.1. Key factors according to these tourists are highlighted where the participants saw themselves in the background of societal trends.

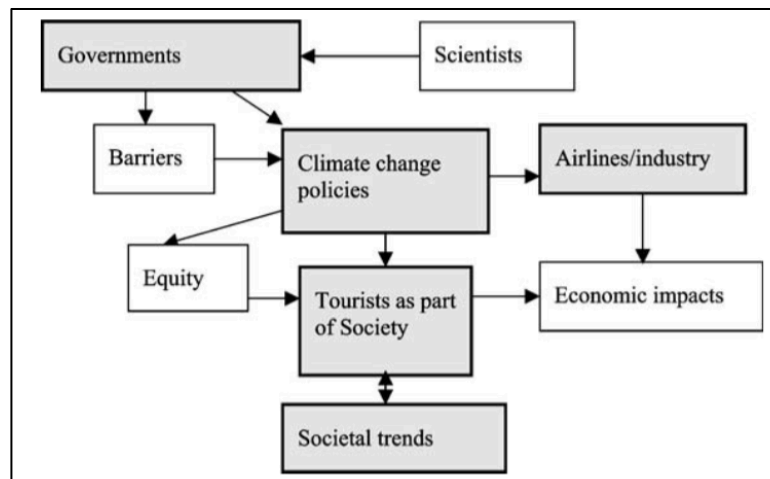


Figure 2.1 Main aspects of climate change policies for air travel external to tourists (Becken, 2007).

The participants shared the opinion that airlines themselves are responsible for emissions, should pay the tax and provide more information when it comes to environmental performance. Conversely, the study also finds that people often see environmental initiatives as greenwashing or advertising and mistrust airlines because of their economic objective.

As seen in the previous articles, the needed behavioural change by consumers seems challenging, the following authors explain why they feel the airline sector itself is responsible for this. Gössling & Peeters (2007) refer to a ‘psychology of denial’ when people think there is no scientific agreement about climate change and therefore believe there is no relevance in changing individual behaviour. The authors mention that especially in air travel this line of thought is strong and hold the sector itself responsible; *“The apparent lack of public awareness of the environmental impacts of aviation might be founded in the fact that the aviation industry puts itself in a good light environmentally”* (p. 413). Also, Burns & Cowlshaw (2014) mention that information provided by the airline sector, in their case UK airlines, has caused confusion in people’s perception of aviation’s share in climate change. They argue that consequently, this confusion is what is causing a barrier to the needed change in air travel consumption behaviour. The next section will further elaborate on both these articles as they provide insight into how airlines communicate about their industries’ relation to environmental issues such as climate change.

## 2.2 Airlines discourses on their role and policies

Gössling & Peeters (2007) performed a study on airline discourses concerning air travel, its environmental consequences and sustainability. This study has identified four major discourses surrounding air travel and environmental impacts used by the aviation industry:

- (1) *“Air travel is energy-efficient. Globally, it accounts only for marginal emissions of CO<sub>2</sub>.”*
- (2) *Air travel is economically and socially too important to be restricted.*
- (3) *Environmental impacts exist, but technology will solve the problem.*

*(4) Air travel is treated 'unfairly' in comparison to other means of transport."*

(Gössling & Peeters, 2007, p.405-406)

The study compared the used discourses to scientific material and data to see whether the arguments by the industry actually correspond with scientific research on these topics. The authors conclude that there is a misrepresentation of data by the airline industry and its representative organizations since it only partly matches scientific results. By presenting selective arguments and not a full picture of aviation and its environmental consequences, the airline industry, maybe unrightfully, tries to illustrate itself as a green, economically and socially valuable sector. This might seem a communication strategy of avoidance rather than taking on the actual problem and leads to confusion when it comes to consumer awareness about environmental impacts of aviation.

Similarly to the above study, Burns & Cowlshaw (2014) have studied how UK airlines have communicated publicly about their role, environmental responsibility and viewpoints to climate change. The study also finds that there are inconsistencies in data, including some discourses which seem trustworthy but others who do not, which is problematic regarding consistency. Also, in their communication the airlines use scepticism towards environmental impacts, claim contradictory priorities and create uncertainty to make their point. The following types of airlines are drawn up based on their communication strategy of climate change: *(1) continuous committed bench markers, (2) realistic technological innovators, (3) minimal practicalities, (4) low-cost innovators, (5) low-cost sceptics and (6) low-cost opposers* (p.750). Interestingly, all the included UK airlines, excluding Virgin Atlantic, put responsibility of mitigating emissions on consumers, and not on themselves as providers of flights. The airline industry here affirms that governments and manufacturers agree together that the golden egg is to be found in the technological developments and that aviation thus might become carbon neutral in the future. It is clear that businesses can influence public perceptions considerably, it is therefore necessary that the messages they spread are in great convergence with scientific knowledge in order to refrain from greenwashing.

Conversely, motivations for the implementation of environmental policies by airlines have been investigated by Lynes & Dredge (2006) by using Scandinavian Airlines (SAS) as a case study. By means of interviewing employees the study has revealed the drivers which shape the environmental commitment of an airline. The drivers were based on the four main subsystems of interest which influence a companies' management approach towards the environment. These subsystems are; *markets, scientific knowledge, the political/institutional system regarding regulations, the social system within and outside of the airline* (p.135). The findings indicate that all the subsystems are equally relevant when it comes to driving environmental management in the case of SAS. The following main motivators for environmental commitment of this airlines have been identified; (1) forms of eco-efficiencies are a

strong motive for SAS, (2) Scandinavian culture influences how the airline values the environment, (3) internal leadership, in terms of ‘environmental champions in senior management positions’ are a key role. The table of primary drivers of environmental commitment and subsets of these primary drivers with an explanation can be found in Appendix 1.

### 2.3 Sustainable jet biofuel

This thesis takes on sustainable biofuel as an initiative to reduce carbon emissions from flying to make aviation more sustainable. Therefore, an introduction to jet bio-fuel and its development is necessary.

For the development of alternative aviation fuels it is essential that these are generated from renewable resources, in particular biomass residues, in order to provide environmental gains (Hari et al., 2015). For ground transportation, the use of biomass for developing alternative renewable fuels has been effective for many years already. According to Yilmaz & Atmanli (2017) biomass will be the best potential as a sustainable energy resource for the fuel used for aircrafts as well. Biomass energy resources are basically any agriculture and animal feed based biological materials which include carbon hydrate, and the fuel which is made from this mass is called biofuel (Yilmaz & Atmanli, 2017).

De Jong (2018) adds that renewable jet fuels can be produced from either biomass or CO<sub>2</sub>, however, to produce renewable jet fuels from CO<sub>2</sub> still lacks mature technology and enough sustainable electricity. He finds that bio-based renewable jet fuel is a structural short-term solution and can reduce the climate impact of flying, if the following preconditions are met;

1. There needs to be a focus on renewable jet fuels which show robust climate impact reductions. *(This is also essential for public acceptance of biofuels)*
2. The development of new conversion technologies needs to be supported. *(Early support is needed because of the growing urgency of aviation emission reduction and the time and resources it takes)*
3. A structural financing mechanism needs to be created to cover the differential costs between cheaper fossil fuels and renewable jet fuels. *(This will increase demand and advocate investment to increase the supply)*

(De Jong, 2018)

Currently there are four generations of biofuels which are produced from different sources. The first generation is derived from traditional food crops, whereas the second generation is made of agricultural residues of food crops, food waste such as used cooking oils or non-food biofuel crops. The third generation of biofuels is made out of algae and the fourth and last generation is produced from genetically modified feedstocks. The first and second generation are at this moment the most feasible ones for producing sustainable biofuels, although the production is dependent on enough available

applicable biomass (Fitzgerald, 2019). Sustainable jet fuels are subject to more strict criteria compared to road biofuels, for example, the fuel needs to be resistant to high altitude and be compatible with existing infrastructure (De Jong, 2018). The climate impact of sustainably produced alternative jet fuel is often measured by the GHG life-cycle assessment which sums up the emissions during the production, logistics, conversion and fuel combustion (De Jong, 2018). The most appropriate sustainable biofuels can save up to 80% of emissions throughout their lifecycle in comparison to conventional jet-fuel (Air Transport Action Group, 2017; IATA, 2018; De Jong, 2018). Although different conversion pathways and supply chains result in a wide range of emission reduction, Climate Solutions (2015) mentions that GHG reduction lies between 55-85%. The aviation sector shows commitment to the development of sustainable jet biofuels as projects and agreements are growing.

The International Air Transport Association (IATA) is committed to reduce carbon emissions and to support sustainable aviation fuels (SAF) - this is the term that the aviation industry prefers and uses. The IATA refers to sustainable aviation fuels as “the only low carbon fuels available for aviation in the short to mid-term” (IATA, 2019). The organization proudly presents on their website an infographic about 10 years of flying on sustainable aviation fuels, it displays what has been done and what can be done better (Appendix 2). The IATA has identified the following main milestones when it comes to the development of sustainable aviation fuel.

<i>2008</i>	The first test flight with sustainable bio jet fuel was performed by Virgin Atlantic.
<i>2011</i>	First commercial sustainable aviation fuel flight was scheduled - KLM Amsterdam-Paris.
<i>Between 2011-2015</i>	22 Airlines performed over 2500 commercial passenger flights with blends of up to 50% biofuel from feedstock including used cooking oil, jatropha, camelina, algae and sugarcane.
<i>January 2016</i>	Regular sustainable fuel supply through the common hydrant system started at Oslo Airport. Alternative fuel producer Neste and supplier SkyNRG as well as Air BP are involved.
<i>March 2016</i>	United became the first airline to introduce SAF into normal business operations by commencing daily flights from Los Angeles Airport, supplied by AltAir.
<i>December 2018</i>	More than 150,000 commercial flights using SAF have been performed.

Source: IATA Sustainable Aviation Fuels fact sheet (2018).

Branch organizations of the aviation industry have set global targets to realize environmental goals in the sector in which sustainable aviation fuels are integral;

- Fuel efficiency improvement of 1.5% on average between 2009 and 2020
- Carbon-neutral growth from 2020 on
- 50% Net emissions reduction in 2050 in comparison to 2005

When it comes to realizing these goals, figure 2.2 shows how the aviation industry envisions the future of emissions in different scenarios. The two goals related to carbon emission are displayed and the light blue zone shows the aimed for scenario in which a combination of new technologies and sustainable biofuels are being used.

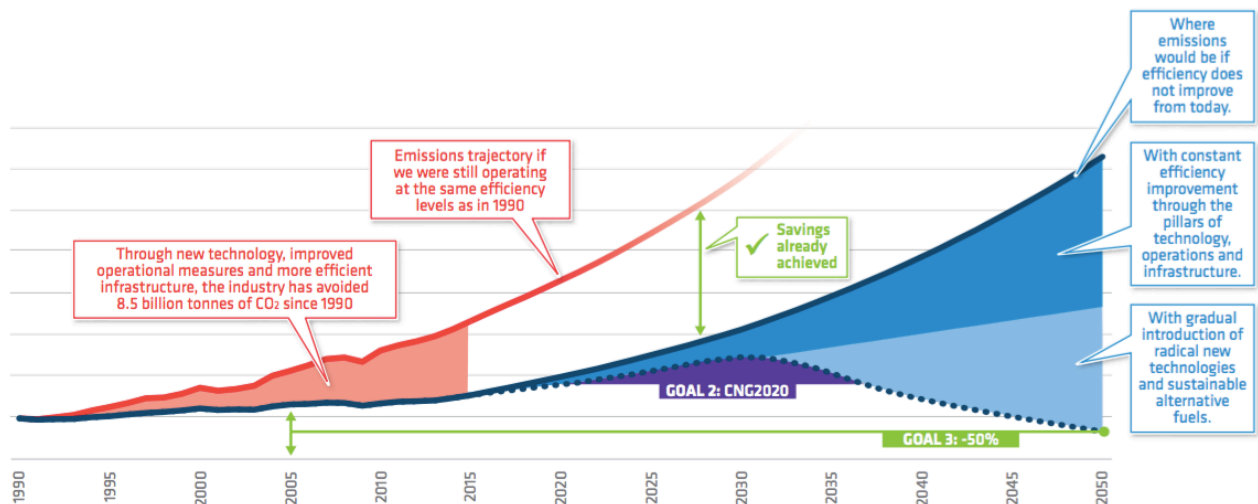


Figure 2.2 Projected aviation emissions over time (ATAG, 2017).

Though it seems that sustainable alternative biofuels are going to play an essential role in reducing carbon emissions from flying, the development is sometimes criticized on the basis of a number of critical issues. Firstly, people assume that there is not enough land to grow crops to feed a growing global population and at the same time produce biofuels, thus biofuels would compete with food production. Professor Osseweijer (n.d) from the Technical University Delft explains in an interview that this is not the case as according to her there is enough land for both, since biofuels are mostly made from residues. Secondly, people think that sustainable biofuels are not in fact that sustainable as they can produce significant CO<sub>2</sub> emissions during production and usage. According to Osseweijer (n.d), the amount of CO<sub>2</sub> that is stored in plants is many times less than the amount stored in crude oil used for fuels. Also, as described before there are many different production pathways for alternative fuel and ones that are being used for aviation need to show a robust climate impact reduction to gain validity. This is one of the reasons why the aviation industry refers to sustainable aviation fuels instead of biofuels, to emphasize the sustainability nature of the fuel.

The first part of this chapter concludes that there is a body of literature that focussed on flying behaviour of consumers and the lack of needed behavioural change for sustainable choices. On the other hand, there is an area of literature on the involvement of airlines and their environmental strategies, with the development of bio-fuel coming from the sector. However, there seems to be a gap in connecting both parties and investigating the interplay of airlines and air travellers and their influence on a transition



towards more sustainable flying. The next part will therefore introduce the concept of political consumerism with two practice approaches which will provide an opportunity to investigate the relation between airlines and air travellers and explore if political consumerism might arise in aviation.

## Part II

*In this part, political consumerism will be analysed as a way to approach the interplay between airlines and air travellers in sustainable aviation and the possibility of political consumerism choices. Firstly, the theoretical underpinning of the concept will be outlined. In the next part, the relation of political consumerism with tourism and in specific with aviation will be highlighted. Further, insight will be given to factors which influence political consumerism behaviour and the relevance of the concept for this research.*

### 2.4 Political Consumerism: Introduction to the concept

Böstrom, Micheletti & Oosterveer (2018) explain that globalization and open trade have caused production and consumption to expand over the globe, delivering consumer goods in large extends. However, often the resources necessary to produce these goods have an unethical or even illegal history, such as child labour or animal abuse. Specific consumer practices such as eating meat are contested nowadays for their destructive production paths and effect on climate change. As such, when consumers perform certain practices or buy goods they are indirectly connected to these alarming societal issues which happen far away from their receipts. Nowadays, increasing attention is paid to these issues by governments and civil society and thus consumer awareness is rising about the global societal problems related to production and consumption.

The concept of political consumerism views consumers as political agents for modern age problem-solving. Stolle & Micheletti (2013) argue “*the emerging framework for political responsibility puts greater pressure on citizens to take daily responsibility in their public and private spheres and should emphasize the role of responsible choice for political problem-solving (p.2)*”. In this sense citizens are empowered by their choices of what to consume and what not as this can contribute to solving public global ‘problems’. Consumer behaviour can thus be of great influence as people buy or do not buy certain products for ethical, political or environmental reasons (Stolle Hooghe & Micheletti, 2005). Various moral deliberations can be involved in political consumerism as well, such as; religion, ethnicity, race, gender relations and our common future (Stolle & Micheletti, 2013). One of the main assumptions of political consumerism entails that people have the potential and sometimes do collectively exert influence on societal developments by means of what they decide to purchase or intentionally not decide to purchase. Moreover, how people are generally concerned with consumption through their discourses and lifestyle (Böstrom et al., 2018).

As political consumerism is a rather complex multilevel phenomenon which involves more than just an

individuals' behaviour and preferences, a categorization of its four basic action forms will provide a more clear understanding. According to Böstrom et al., (2018) scholars distinguish the following action forms of political consumerism: (1) boycotts, (2) buycotts, (3) discursive political consumerism, and (4) lifestyle political consumerism. These different forms show that approaches towards market-based practices differ from being confrontational to cooperative. Boycotts are seen as the 'negative' form of action and involve individuals or groups refusing a certain product, good, practice or even boycott a country. If civil society organizations are behind boycotts they can put pressure on corporations by serious demands in their boycott campaigns. Secondly, buycotts are seen as a rather positive practice of political consumerism. Campaigns about buying organic food or sustainable clothing brands can be seen as facilitating buycotts as they invite people to buy these goods to support positive change in the respective industry. Discursive political consumerism is described by Böstrom et al. (2018) as *'confrontational culture jamming of iconic corporations and their clever logos and slogans'* (p.4). This form can be seen as antibranding activism by which companies are targeted for their lack of environmental or societal efforts. Discursive political consumerism invites people to critically look at their consumption behaviour and can lead to the third form of lifestyle political consumerism. This last form includes the other three forms and means that someone re-examines their whole lifestyle and consumer choices with that. Eventually, in lifestyle political consumerism, someone changes the way he or she lives which entails a serious commitment to conscious and considerate consumer practices.

An area in which political consumerism can be exemplified is the food industry. People around the world are getting aware of global food issues such as food scarcity, animal welfare, unsustainable production and environmental degradation. In the food industry, labelling schemes which provide categorical and simple information about the product and its production are making political consumerism possible (Stolle & Micheletti, 2013). In this way, consumers are offered a choice to buy, for example, a "Fairtrade" product which is organically farmed instead of a conventionally or mass produced good. The following chapters will show how political consumerism has been discussed in tourism literature and in particular its implications for aviation.

## 2.5 Political Consumerism in relation to tourism

In tourism, the issue of political consumerism is not as straight-forward as in the food industry, though it is gaining attention. Ozalp & Zwick (2008) use volunteer vacations or "voluntourism" to highlight how political consumerism can be exerted in tourism. They mention that voluntourism is a form of political consumerism as tourists take responsibility in helping others and try to achieve public virtue through their holiday consumption. Jordan, Wurzel & Zito (2011) add that the products and services in the tourism sector are eligible for eco-labels, arguing that these labels can support environmental responsibility-taking amid political consumers. Budeanu (2007) agrees that eco-labelling is a good mechanism for raising awareness and stimulate tourists to make sustainable travel choices. Furthermore, Lamers et al. (2018) argue that products or packages such as slow travel, conservation tourism, volunteer

tourism and whale watching allow for political consumerism in sustainable tourism as these products can enable a stronger role for the conscious tourism consumer.

## 2.6 Political Consumerism and Aviation

There is not much known about tourism mobility and aviation in particular, in relation to the concept of political consumerism. However, two papers specifically focused on tourism mobility and political consumerism and provide some relevant insight for applying the concept in this research.

In their study on transitions towards sustainable tourism mobility, Verbeek & Mommaas (2008) refer to political consumerism being exerted by either tourists in their citizen-consumer role or as active change agents. The authors agree with Lamers et al. (2018) that tourists are important agents of change as it is their travel behaviour that influences the (un)sustainable development of tourism movement, and therefore, changes in travelling behaviour are necessary to achieve sustainable tourism transport. These authors further emphasize the important role of tourism businesses as they are the ones which need to fulfil the interests and preferences of green, political and/or ethical tourists through the development of new strategies, products and services. Then, developing and going on holidays will become an equal process for citizen-consumers, producers and providers together in order to create “*more sustainable tourism mobility behaviour*” (Verbeek & Mommaas, 2008, p. 640).

When it comes to aviation, Lamers et al. (2018) have set the sector aside as the ‘key weak pocket’ of political consumerism for sustainable tourism. People can behave in an environmentally friendly way and purchase holiday packages with this ideology, but still exhibit carbon-intensive behaviour as they take a (long-haul) flight to get to their destination. As has been mentioned before, people do not often consider climate change when booking their holiday and therefore do not take into account the impacts of their flight. Verbeek & Mommaas (2008) add that a political ‘boycott’ in tourism mobility would be to start travelling with environmentally friendly transport modes such as a bus or train. In this manner, can choosing to fly with a more sustainable flight instead of a regular flight also be seen as a political consumerism boycott in aviation?

## 2.7 What drives Political Consumers?

This thesis will analyse the interplay of providers and consumers in sustainable aviation initiatives and with that the opportunity of political consumerism choices in the sector. Therefore, it is necessary to understand what influences political consumerism behaviour, in order to explore whether this occurs or can occur in sustainable aviation. To understand what facilitates political consumerism behaviour will help to investigate the possible influence that air travellers can have in generating more sustainable aviation, as well as the role of the airline in facilitating this.

Micheletti (2003) explains that the use of virtues and ethics are necessary for taking responsibility in a good manner, thus making consumer choices out of integrity and for public advantages. She adds that

feelings of empathy, social justice and solidarity are an important basis for public virtue decision-making. Consumers whom start to feel concerned for other people's situation are likely to try to find products which expresses these concerns for others. Lastly, she argues that uprightness and fair-mindedness are traits for political consumerism as *"they allow people to embed their concerns in societal and public concerns"* (p. 150).

Neilson & Paxton (2010) investigated the relationship between social capital and political consumerism as they argue that consumer behaviour is rooted in social relations. These authors hypothesize that positive social interactions between individuals as well as between individuals and institutions offer the motivation and information needed for social change. Social capital relies on the degree of the two components; general trust and association membership. The result of these circumstances are two mechanisms which link social capital with political consumerism - information and motivation. *"People with greater social capital have both more access to information that might lead them to consume politically, and more motivation to act on this information."* (Neilson & Paxton, 2010, p.7). So, association membership can provide information about social or environmental issues and also is a source for motivation to take action. However, social capital can thus be seen as a facilitating condition on an personal level to political consumer behaviour.

Shah et al. (2007) explored the relationship of political consumerism with a range of dispositional factors, communication variables and consumption orientations. They used the OSOR model to explain a range of factors which are of influence on political consumerism behaviour. The authors argue information such in conventional and online news stimulates political consumerism indirectly, through the influence it has on environmental concerns and driving political discussions. Shah et al. (2007) see political consumerism arise as a dynamic behavioural response to modern-day information and the orientations that people get from absorbing such news. The factors information and communication can thus be seen as external factors which indirectly drive political consumerism behaviour.

A study by Scruggs, Hertel, Best & Jeffords (2011) can provide more profound insight as they evaluate key factors which influence political consumerism behaviour. In contrast to Shah et al. (2007), these authors have found that individualized social trust does not have a significant impact on political consumerism. The results of their study indicate that information does play an important role in some types of political consumerism. The rationale behind this is that consumers mostly rely on information such as advertising or product labels during decision-making, and therefore, the availability and credibility of such information can influence purchasing choices. Scruggs et al., (2011) have drawn up four aspects of information which seem essential in order to facilitate political consumerism:

- 1) *Easily available information about production characteristics,*
- 2) *reliable information about production characteristics,*

3) high factual knowledge about issues, and

4) wide availability or access to goods that are (or claim to be) produced in more politically desirable ways (Scruggs et al., 2011, p.1106).

This last point highlights a seemingly important aspect which has not been included in other reviewed articles, a person needs to have the option or be in access to more ethically or environmentally conscious products. Logically, if someone simply does not have the choice or option to buy a product or service which supports their social, ethical or environmental conscious beliefs they will probably not be involved in political consumption. Also noteworthy, if people perceive information to be untrustworthy, they will become unwilling to make ethical purchase decisions. As the authors sum up the importance of information for political consumerism;

*“When consumers encounter common, easy-to-understand labelling and appropriate shortcuts in place to help them differentiate how classes of products are made, they will generally be more likely to translate social concerns into consumer action.”* (Scruggs et al. 2011, p. 1106).

Scruggs et al., (2011) have drawn up an explanatory model for political consumerism, which they define as having stopped purchasing products for one or more ethical reasons, thus boycotting (figure 2.3). This model is based on the Attitude-Behaviour-Context (ABC) framework which serves as the foundation. In this regard, behaviour is a function of several attitudinal factors which also form the motivation for this behaviour. Yet, contextual factors intervene and shape the way attitudes are translated into behaviour. Contextual factors are thus seen as facilitating conditions. Based on this model, the authors concluded that people are more likely to consume politically when they are concerned about certain conditions in a particular subject and believe that their consumption choices help to resolve those issues.

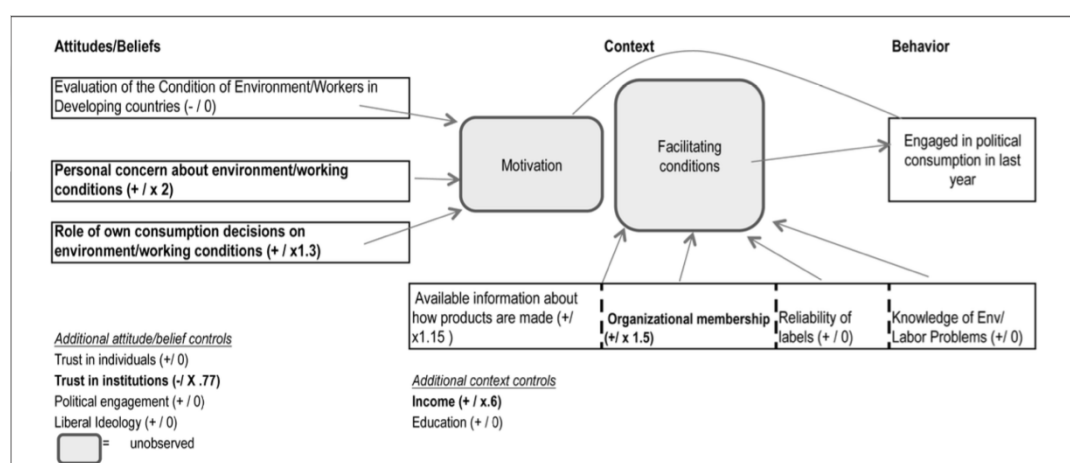


Figure 2.3. Model for political consumerism based on the Attitude-Behaviour-Context framework (Scruggs et al., 2011)

## 2.8 Provider & Consumer in Transition paths

Previous authors merely explained intrinsic drivers and context specific factors which facilitate political consumerism. Not much can be said thus about the role of providers and their interplay with consumers in enabling political consumer behaviour. The following literature is relevant as it includes two practice approaches to analyse in what ways there is an interaction between consumers and providers which also gives substance to political consumerism. First it is important to understand generally where the interplay between consumers and providers exists in production-consumption chains. Later, the study by Verbeek & Mommaas (2008) provides especially relevant insight in consumer and provider interactions in tourism mobility.

Spaargaren & Van Koppen (2009) adopted the social practice approach to develop an info flow model and a power flow model to show where providers and consumers can have an influence on direct and indirect environmental impacts of production and consumption. Direct impacts relate to the environmental impacts that consumers cause themselves by 'direct use' of products. Indirect impacts refer to the pressure on the environment that is the result of all activities before the product is used as well as the impacts after the use phase - the way that it is disposed of. Distinguishing between the two different impact levels is important since it identifies that the environmental behaviour of citizen-consumers is also determined by the impacts caused in the provider stages of the chain. Label systems are again ways through which direct and/or indirect environmental impacts are made visible to consumers, however, in most cases only the phases that contribute the most to the total impacts in the life cycle are included (Spaargaren & Van Koppen, 2009). These ecolabels are forms of communication at the consumption junction - where access and provisioning meet - by providing information about the product's life cycle impact. While it is also a way of consumer involvement in the product chain. When it comes to reducing negative environmental impacts, consumers have more executive power and means to influence direct impacts than they do for indirect impacts. The dynamics of exercising power of consumers and providers is visualized by Spaargaren & Van Koppen (2009) in the info flow model in figure 2.4a and power flow model in figure 2.4b.

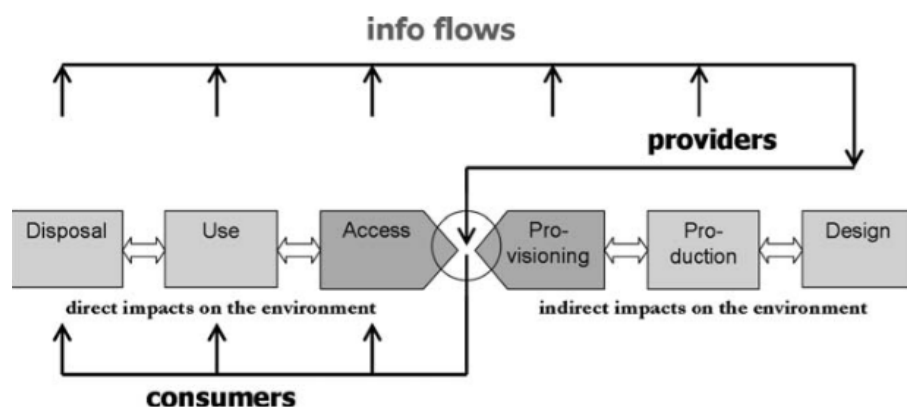


Figure 2.4a. Information flows related to 'direct' and 'indirect' environmental impacts (Spaargaren & Van Koppen, 2009).

The above figure shows how providers collect information about impacts of the production-consumption chain and communicate this at the consumption junction to consumers whom can use this information to decide whether to buy (access) the product, in ways of using it, and how to dispose of it. When we apply this model to the aviation industry however, it can be concluded that disposal is not relevant, as air travellers do not have an influence on the disposal of a flight. In the case of aviation, consumers can only use information to decide whether to buy or not buy a flight ticket or for example compensate their CO<sub>2</sub> emissions.

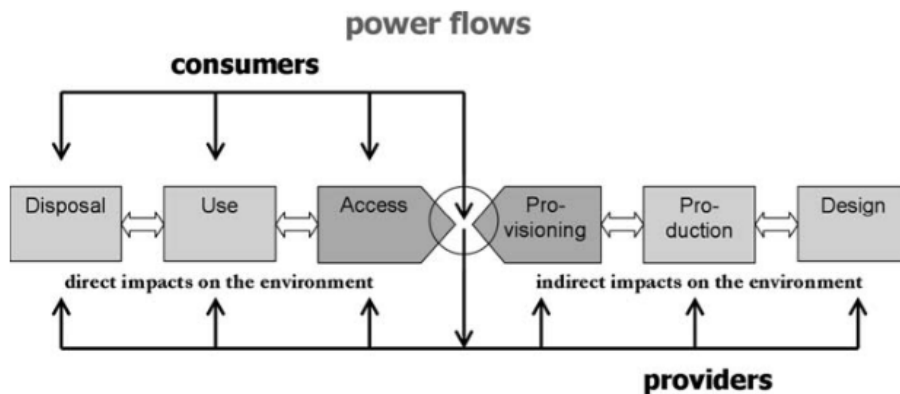
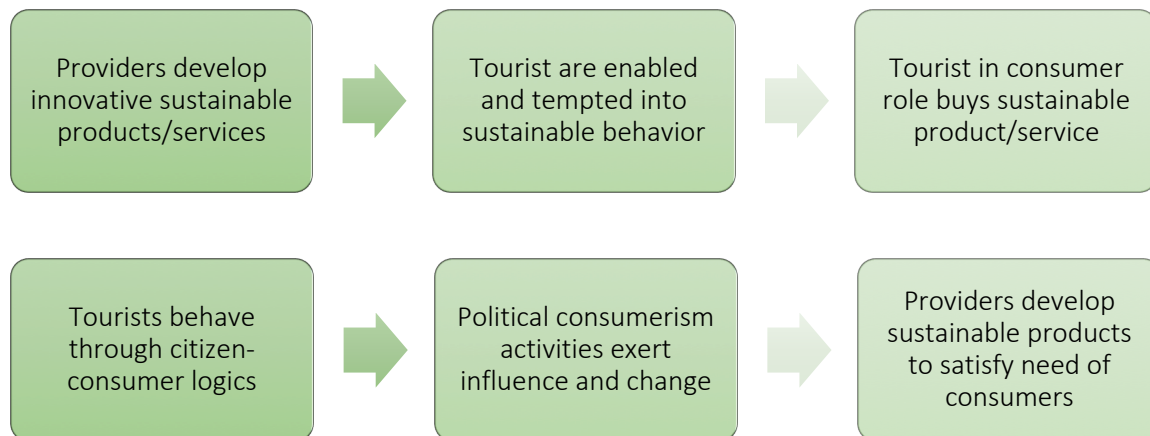


Figure 2.4b. Relative power of consumers and providers in influencing the (in)direct environmental impacts in production-consumption chains (Spaargaren & Koppen, 2009).

Figure 2.4b shows the power of consumers in their ability to directly change the way they access, use and dispose of the product. However, the model also highlights how consumers have the power to influence providers in the consumption junction by buying (buycotts) or not buying (boycotts) certain products. The arrow in the middle shows that by doing this, consumers have the power to affect all phases of the chain as their buying behaviour can for example influence providers to make changes in product design. Also for this model, when looking at the aviation sector as a different consumption domain, the disposal stage is not applicable. In both these models, again the essentiality of information and communication by providers in facilitating certain behaviour of consumers comes back.

Regarding provider and consumer influences when it comes to transitions towards sustainable mobility, the study by Verbeek & Mommaas (2009) is reviewed. The authors also use the social practice approach to link the organizational and technological side of tourism mobility with travellers' attitudes. Their findings are especially relevant for this thesis since they lay-out the influence of the provider as well as the consumer (tourist) in the case of sustainable tourism mobility. The study gives insight in how providers of tourism services and products co-create holiday practices together with tourists as agents of change. Verbeek & Mommaas (2009) argue that to analyse the potential role of tourists in a transition process towards sustainable mobility one can identify two citizen consumer-led change processes, or, "two possible transition paths through which (citizen) consumers might act as change agents" (p. 641). When applying the model to this research though, the focus is not placed on how only consumers act as change agents, attention is given to the influence of both provider as well as the consumer, as they are

both included in the transition path. The first transition path includes tourists in their consumer role and providers which develop sociotechnical innovations through which they enable and tempt tourists to sustainable behaviour. In the second path, tourists behave through citizen-consumers logics and exert influence and change through political consumerism activism such as boycotts, boycotts or social movements. These insights will be used to analyse the outcomes of this research, to conclude which transition path seems to unfold in the specific case study. A characterization of the two citizen consumer-led change processes can be found below in figure 2.5.



*Figure 2.5. Two possible transition paths through which (citizen) consumers act as change agents (based on Verbeek & Mommaas, 2009).*

This chapter shows how two practice approaches offer an opening to analyse the interplay of airlines and air travellers together with the possibility of political consumerism in the sector. These practice theory concepts provide a more complete perspective in analysing human behaviour in a consumption context rather than explaining social phenomena in terms of individual actions like the attitude-behaviour gap.

## 2.9 Synthesis of the framework

This section summarizes the previous insights of the theoretical framework into a coherent overview and visualization (figure 3.4). The concept of political consumerism has been taken as a perspective to look at provider and consumer influences in consumption chains. For this thesis it will be used in the aviation sector, to look at airlines (providers) and air travellers (consumers) in the consumption practice of flying. Political consumerism as ethical, political or environmental consumption behaviour can be divided into four different action forms. Boycotts and buycotts are the basic action forms and most relevant in this study. To explore the potential of political consumerism behaviour the factors of influence on such behaviour have been investigated. Information regarding production characteristics and environmental impacts, communication of this, and the availability of responsible products are main influential factors.



Consequently, two practise approaches offer the possibility to analyse the interplay of airline and air traveller in a sustainability transition, and the opportunity for political consumerism. Firstly, it can be concluded that providers (airlines) can influence the decisions of consumers (air travellers) to buy or not buy a flight by means of information and communication, such as labels. While consumer power lies in buying or not buying a flight by which they can influence the design, production and provisioning decisions of airlines. Additionally, Verbeek & Mommaas (2009) identified possible transition pathways towards sustainable tourism mobility in which tourists can act as agents of change. In this research the transition paths are used to also look at the role of the airline. The two pathways are; (1) Providers develop sustainable innovative products which enables tourists in their consumer role to buy these more sustainable products, (2) citizen-consumers act as agents of change as they exert influence on providers through political consumerism activities, and providers will eventually develop more sustainable products to facilitate this demand. It is therefore interesting to use this lens for analysing the influence and position of airlines and air travellers in a transition towards more sustainable aviation.

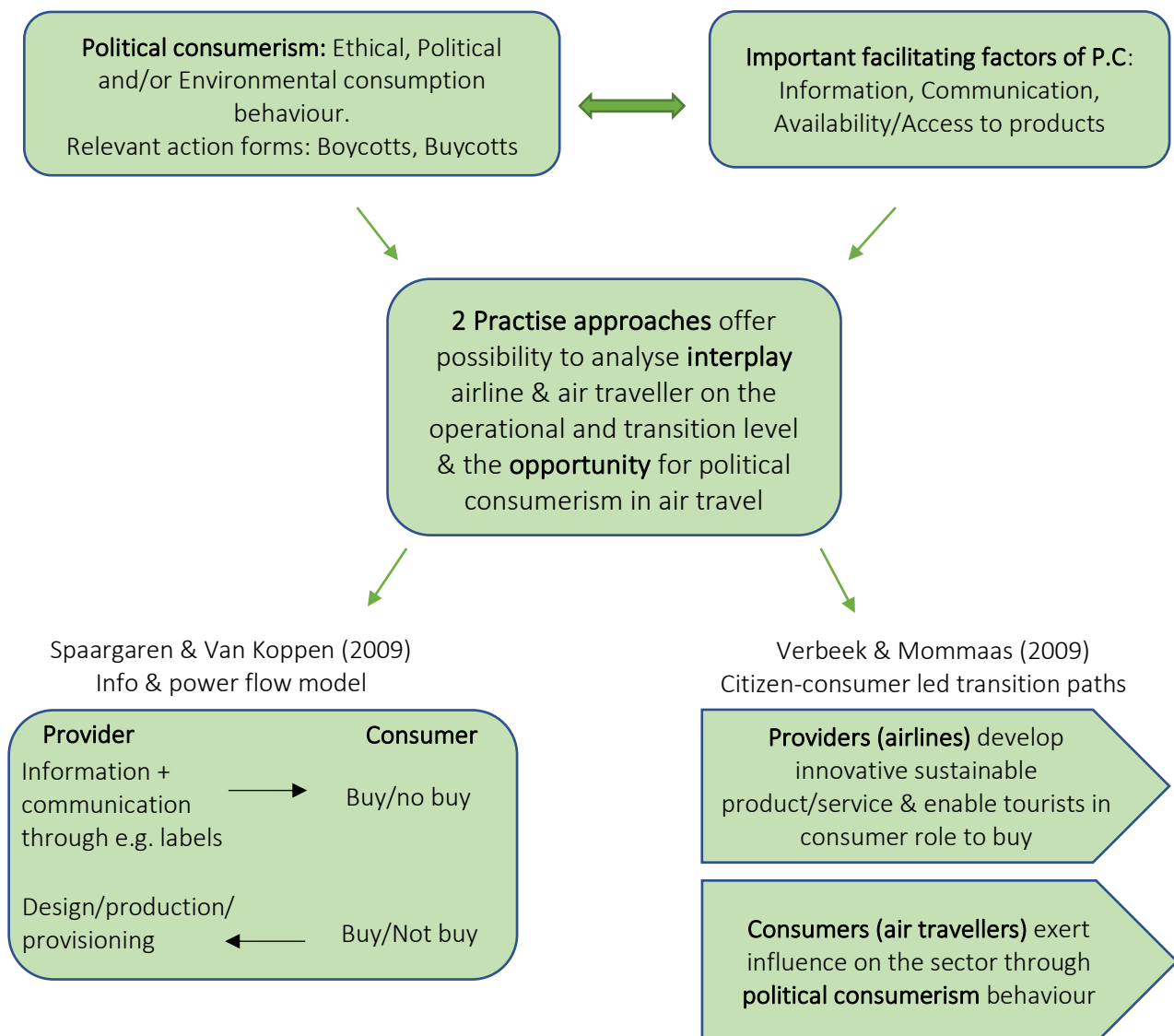


Figure 2.6 Conceptual framework.



### 3. Taking off

*This chapter describes the methods that are used for collecting data to be able to answer the research questions. In the first paragraph the overall research design is explained together with a justification for this general strategy. In the following section the data collection methods are laid out; semi-structured interviews and a questionnaire. In section 3.3 the methods for data analysis are presented which consists of coding and SPSS analysis. Lastly, limitations of the research design are discussed.*

#### 3.1 Research design

This research is from an exploratory kind as it investigates an objective which seemingly has not been studied yet and of which the situation is still undefined (Boeijs, 2010). The research is approached through two different research strategies each having their own data collection method. A case study which illustrates a bio-fuel initiative for sustainable aviation forms the first strategy, for which in-depth interviews have been conducted. Due to limitations described in the end of this chapter, the survey could not be performed entirely in the context of this specific case study. Therefore, the survey was designed for investigating the general opinion of travellers towards sustainable aviation initiatives and bio-fuel, which is then projected onto the case study. An explanation of the survey can be found in the section *data collection*. The case study is described in the below placed grey box 3.1.



##### *Box 3.1 Case Description*

The case study for investigating the interplay of airlines, bio-fuel and travellers is the new flight-route between Amsterdam and Växjö - Sweden, launched May 2018 by KLM Royal Dutch Airlines. A daily flight is introduced with an Embraer 175 carrying 88 passengers. What makes this flight special is the fact that it is the most sustainable flight that KLM is currently offering. The Växjö route is promoted as CO<sub>2</sub> neutral as 5% of sustainable produced bio-fuel is being repurchased. KLM is using bio-fuel that is derived from used cooking oil and provided by SkyNRG, world leader in the supply of sustainable aviation fuels. The remaining carbon offset of the flight is being compensated by KLM and Växjö Småland Airport together through the CO<sub>2</sub>OL reforestation program in Panama which is a Golden Standard certified project aiming to compensate carbon emissions (KLM, 2018). In fact, there is no actual sustainable bio-fuel onboard the Växjö flight itself since there is only one production refinery, in Los Angeles. Therefore, a calculation is made how much 5% of the used fuel of the Amsterdam-Växjö route is, which is then bought in bio-fuel and used for flights leaving Los Angeles. What is unique about this project is the cooperation of KLM with the local community of the Växjö region to make this sustainable flight happen. This has to do with the Corporate Biofuel Program (CBP) of KLM through which companies can purchase bio-fuel for their corporate travels performed by KLM. After opening the Växjö-route, Södra, the largest wood production company of Southern Sweden has joined the CBP as well. On the launch day of the Växjö flight a 'letter of intent' was signed by KLM, the municipality of Växjö and Södra to perform a feasibility study to locally produce jet bio-fuel from the waste of wood production. This has become an important side-project of the Växjö flight-route cooperation.

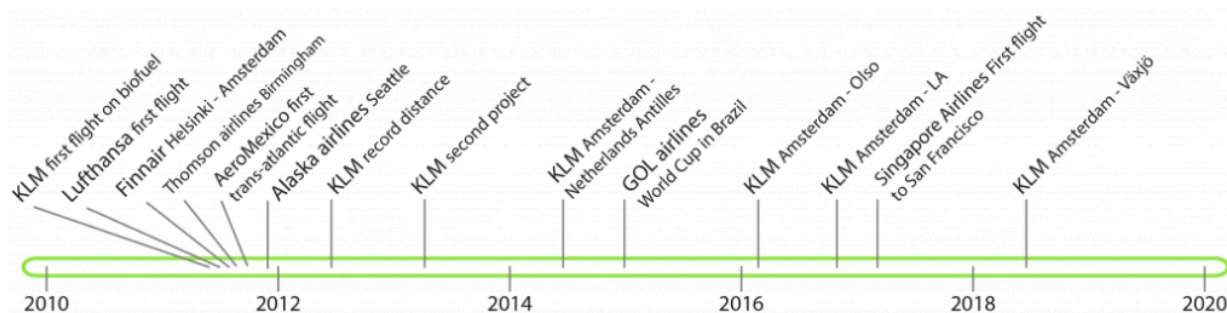


Figure 3.1 Timeline KLM's main developments in bio-fuel flights (Fitzgerald, 2019).

The timeline above shows a short overview of KLM's development of bio-fuel use for commercial flights, with Växjö being the most recent one.

### 3.2 Data collection

To be able to answer the research questions applied in the above described case, a mixed-method design has been chosen. Qualitative methods are useful to understand thoughts, experiences, actions and expressions which help to interpret human behaviour (Boeijs, 2010). Moreover, qualitative methods are useful in this case as the research is of an explorative nature in which it has not yet been clearly defined what is going on. As for quantitative data collection, a traveller survey has been used since this enables the measurement of certain characteristics of consumers and their perception of sustainable aviation initiatives such as bio-fuel. Combining these two methods aims for a first thorough understanding of the role of airlines and air travellers in the context of a sustainable bio-fuel aviation initiative.

#### 3.2.1 In-depth interviews

In-depth interviews were an important technique to gather data for this study. Through interviews it was possible to understand the anticipations of KLM as an organization about launching a project concerning sustainable aviation, in particular bio-fuel use. Also, the role of KLM in investing in such an initiative could in this way be understood from the organization's perspective. A semi-structured approach was chosen for conducting the interviews. A reason for this is that a structured approach would not allow for important unforeseen issues to be discussed and thus limit flexibility of the interview. An interview-guide (Appendix 3.1) was made to facilitate the interview and consisted of predefined topics which included guiding questions, subtopics and probing questions. Even though the interview was semi-structured, an amount of fully defined questions was included as an answer to these were vital to the research. The guide was inspired by a range of sources. Firstly, by the researcher's preliminary knowledge on the case and issues surrounding sustainable aviation initiatives in relation to consumers. Also, important aspects that came out of the theoretical understanding of political consumerism were incorporated into the questions such as 'feeling of responsibility', 'information and communication' and expectations about 'buycotts'. Lastly, questions were also directed at understanding the whole

construction of the Växjö project and the organization's view on their environmental efforts and commitment.

The participants of the interviews were not selected by the researcher but by the contact person of KLM, which was the Sustainability Manager of the airline. She had the knowledge of who was involved in setting up the Växjö project and could therefore provide contact with the relevant people. Eventually, five employees of KLM whom were directly involved in the Växjö project were interviewed, including the General Manager of the Nordic region whom was responsible for the project. Additionally, the person responsible for the Växjö airport and a representative of the Växjö municipality were interviewed as they represent the other main parties which made this project possible.

The list of interviewees with their corresponding codes used in the result section can be found below in table 3.2.

Group	Function	Code
<u>KLM</u>	Sustainability Manager	KLM-SUM
	Sales Manager	KLM-SM
	Marketing Communications	KLM-MC
	Key Account Manager	KLM-AM
	General Manager Nordic	KLM-GM
<u>Växjö Airport</u>	Marketing Manager and Customer Relations	Airport
<u>Växjö Municipality</u>	Environmental Coordinator	Municipality

Table 3.2 List of interviewees with corresponding codes.

### 3.2.2 Survey

To gather data on air travellers perceptions towards sustainable aviation initiatives and bio-fuel use, a survey was performed and can be found in (Appendix 3.2). This survey has been designed by the researcher herself based on the literature concerning political consumerism and to get a full understanding about the opinion of travellers towards sustainable aviation use by airlines.

Firstly, the measurement indicators which Shah et al. (2007) used in their research have been reviewed. The authors used the following three indicators for political consumerism measured on a 6 point agree-disagree scale:

- (1) "I will not buy a product from a company whose values I do not share"
- (2) "I have boycotted products or companies in the past"
- (3) "I make a special effort to buy from companies that support charitable causes"

These three indicators have been used as a basis to formulate statements which fitted the topic of sustainable aviation. The following two statements were the results and were included in the survey;

“ I will not buy a flight ticket from an airline which does not invest in sustainable aviation”

“I would make an effort to purchase a flight ticket from an airline that invests in sustainable aviation”

Next to these statements directly aiming to possibly measure political consumerism, other related factors of political consumerism have been processed in statements. These factors are information, communication and information and responsibility. This selection is based on the theoretical review of political consumerism. Shat et al. (2007) concluded that information and communication have an indirect influence on political consumerism behaviour whereas Neilson & Paxton (2010) also refer to information as a factor which is influential to political consumerism. Next to this, Stolle & Micheletti (2013) state that political responsibility and taking daily responsibility in consumer choices is essential to political consumerism. It is therefore taken as an important factor to see whether consumers feel this sense of responsibility when it comes to sustainable aviation. Furthermore, a statement is included to measure if sustainable aviation initiatives might influence pro-environmental behaviour of travellers. Other statements are created to see whether people consider themselves as environmentally conscious, believe in the concept of sustainable aviation and if investment in bio-fuel has a positive influence on their opinion of KLM.

Due to limitations which will later be described, the survey could not be performed at the departure gate of the Växjö-flight at Schiphol and was distributed online. To be sure that people who frequently use air travel would participate, the survey was posted in traveller-pages on the platform Facebook. The survey was designed via the software SurveyMonkey which enabled sharing of weblinks.

### 3.3 Data analysis

#### 3.3.1 Interview Analysis

All interviews were voice recorded and could be fully transcribed in English. For analysing the transcribed interviews, both a deductive as well as inductive approach to coding the interviews has been used. The purpose of coding is to separate the data into meaningful parts which can then be interpreted and transformed into results (Boeije, 2010). For deductive coding, the theory and literature has been used, the categories or themes that were most relevant for this thesis have been transformed into codes and used when reading the transcripts. Example of such codes were; “responsibility as an airline”, “environmental commitment” and “communication”. These a priori defined codes were important since it enables to connect the interview data to theoretical concepts relevant to this study and make sense of the data.

For the inductive approach, the codes were derived during carefully reading the transcripts by means of open coding (Boeije, 2010). The most striking and relevant topics that came up from the transcripts were highlighted. In vivo code terms, which are the exact words of the respondent (Boeije, 2010), were also

used as they could indicate repetition of that certain word and topic. All fragments were then compared among each other, grouped into categories dealing with the same topic and labelled with a certain code. During the process of selective coding, all codes and fragments were read again to look for connections between and within different categories. After this, the most important categories could be identified and a story-line within each category was drawn up. These categories are referred to as major themes in the result section.

### 3.3.2 Survey Analysis

A total of 102 survey responses were gathered which were first quickly reviewed in the SurveyMonkey website analysis section. This provided a first overview of what kind of data was gathered and assurance of valid responses. Then, the data was exported as xls. file into Excel in which variables were labelled. The data file was then uploaded into the program SPSS Statistics in which the analysis has been performed. Since there was no hypothesis to be tested, the data could be analysed by means of descriptive statistics. Firstly, the demographic characteristics and predominant flying purpose were computed to get an overview of the sample profile. By means of frequencies, the mean responses to each of the statements were derived. Via the separate histograms, the distribution of given (strongly disagree – strongly agree) answers for each of the statements could be analysed. Through the chart builder function, the string variables Awareness\_KLM\_Biofuel and Biofuel\_Compelling\_Factor could be transformed into bar charts. This function shows a clear distribution of what the respondents answered. The CrossTabs function has been used to reveal if there are striking variances in whether people feel bio-fuel is a compelling factor in their airline choice according to their age or flying purpose. The following variables were analysed with CrossTabs; Age groups\*Biofuel\_Compelling\_Factor and Flying\_Purpose\*Biofuel\_Compelling\_Factor. Lastly, in the survey analysis, a reliability analysis has been performed to find out whether the two statements *“I would make an effort to purchase a flight ticket from an airline that invests in sustainable aviation”* and *“I will not buy a flight ticket from an airline which does not invest in sustainable aviation”* aimed to measure political consumerism, are in fact related and measure similar behaviour to a reliable extent. Since Cronbach’s Alpha was not sufficient for these two statements, a new index measuring a latent form of political consumerism has been made, which will be more thoroughly discussed in the results section.

### 3.4 Limitations research design

The design of this research posed some limitations, also during the process of data collection some difficulties were faced.

First of all, this thesis research has been conducted in cooperation with an external company (KLM) providing the case study. Even though the researcher was not employed or given directions by the company on how to perform this study, the thesis would ideally also be of relevance to KLM. This

shaped the research questions to an extent and items included in the survey. Next to this, being reliable on another company for data collection posed some difficulties. Firstly, being a student conducting a thesis research you are not the highest priority to people, which meant that showing commitment and continuous efforts by frequent mailing was important in approaching people.

When it comes to conducting the survey some difficulties were faced. Ideally, the survey was going to be part of the case study, and passengers of the Växjö flight were going to be the participants of the survey. However, it appeared forbidden by Schiphol to do research at the particular gate where the Växjö flight was departing. KLM was allowed to do research at three predefined gates by Schiphol, which affected the research and the design of the survey. For example, it was not possible anymore to ask people if they knew about the sustainability character of this flight, and if this was a factor of their choice for booking it. Eventually, accompanied by survey designers of KLM, testing was done at the predefined gates. However, as there were no flights leaving during that part of the day, there not many people at the gate. Together with being dependent on the survey designers to have permission to perform research at those gates resulted in a limited time at the gate and only 9 respondents. This fall-back had to be overcome and another way of gathering respondents for the survey had to be decided on. Consequently, the survey was conducted online and aimed for a general understanding of traveller/consumer sensitivity of sustainable aviation and biofuel initiatives and not directly connected to the Växjö flight anymore. This mainly impacted the results by not being able to find out whether bio-fuel was a reason for choosing the Växjö flight. However, all statements are formulated in a way that they are relevant to the initiative. Since this thesis is making use of a specific case-study, the interview findings are not generalizable to all airlines or all sustainable aviation initiatives worldwide.

### 3.5 Positionality, reliability, validity

When it comes to positionality of the researcher, it should be noted that there was no contract or employment by KLM at all. Therefore, the study is carried out objectively without favouring KLM in data analysis or influencing participants about this airline. In this sense, the researcher was external to the research. However, since in-depth interviews have been used which require the interpretation of the researcher, it should be mentioned that this might affect reliability of the research, as the outcomes of the research might vary if another researcher will perform this qualitative analysis. However, the developed interview guide and coding scheme could help overcome this issue to some extent. Validity concerns whether the research measures what it is supposed to measure (Boeije, 2010) and is in qualitative studies often referred to as dependability. Validity is more easy to test in terms of entirely quantitative research, since this research is using mixed methods it is more difficult to ensure. Validity in the interviews is ensured through incorporating different aspects relevant to political consumerism into the interview guide. When it comes to the survey, a reliability analysis has been performed to test reliability of the developed measurement index.



## 4. In-flight

*In this chapter the results of the research will be presented, these will be divided into the survey results and interview results. The survey results are presented by tables and figures which show the most striking and relevant outcomes, provided with an explanation. Whereas the interview results are structured according to the most important themes that came out of the transcripts analysis.*

### 4.1 Survey Results

This chapter will describe the outcomes of the traveller survey. Firstly, the characteristics of the participants will be laid out to give a brief overview of the sample profile of the research. In the next sections, the most relevant and striking findings will be shown concerning participants perception of sustainable bio-fuel flights, their awareness of KLM's efforts and statements indicating political consumerism behaviour.

#### 4.1.1 Participant characteristics

A total of 102 valid questionnaires were gathered and accepted for data analysis. Below, table 1 displays the general characteristics of the survey participants. The data in the table shows that the vast majority of the respondents is female (65,7%). Concerning age of the participants, the most represented age group is between 26-35 years old. It is clear that the majority of the respondents was under 35 years old (74,5%)

	Category	N	%
<b>Gender</b>	Female	67	65,7%
	Male	35	34,3%
<b>Age Groups</b>	16-25	34	33,3%
	26-35	42	41,2%
	36-45	11	10,8%
	46-55	8	7,8%
	56-69	7	6,9%
<b>Predominant flying purpose</b>	Holidays	76	74,5%
	Business	11	10,8%
	Visiting friends/family	12	11,8%
	Other	3	2,9%

*Table 4.1: Sample characteristics*

where the mean age is 31,8 years old. This might have to do with the fact that the survey was distributed only via social media on various platforms where age of people was relatively young. A younger group of respondents is relevant for this research as it represents a generation which is perhaps more inclined to make more conscious travel choices and stimulate a positive change. When asked about their predominant flying purpose, the main purpose of participants was holidays (74,5%). After that, business and visiting friends/family were almost equally as often chosen as predominant flying purpose.



#### 4.1.2 Traveller perception of sustainable flight initiatives

This section will show the results of the questionnaire concerning traveller perception towards sustainable aviation initiatives like bio-fuel driven flights.

##### Awareness

Something that immediately stood out of the results was the unawareness of respondents concerning the fact that KLM invests in sustainable aviation fuels for their flights. When asked about this, the majority of the travellers (73,5%) responded that they did not know that KLM is investing in sustainable bio-fuel (figure 4.2) . At the same time, concerning the question ‘*Suppose you can choose between two airlines to get to your destination. Will the use of biofuel be a compelling factor in your choice?*’ the most popular answer was ‘Yes’ (77,5%) (figure 4.3).

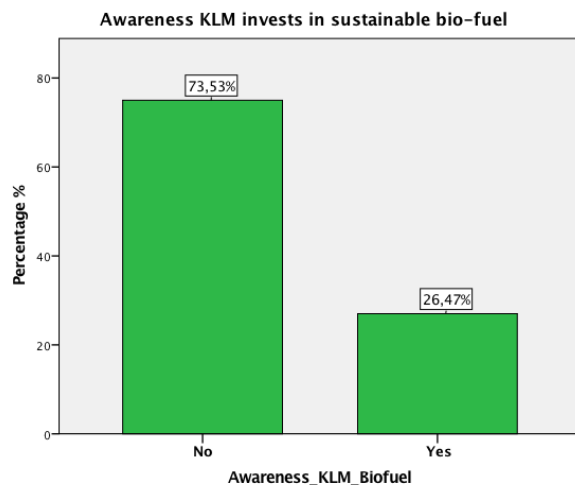


Figure 4.2: Traveller awareness KLM investing in bio-fuel.

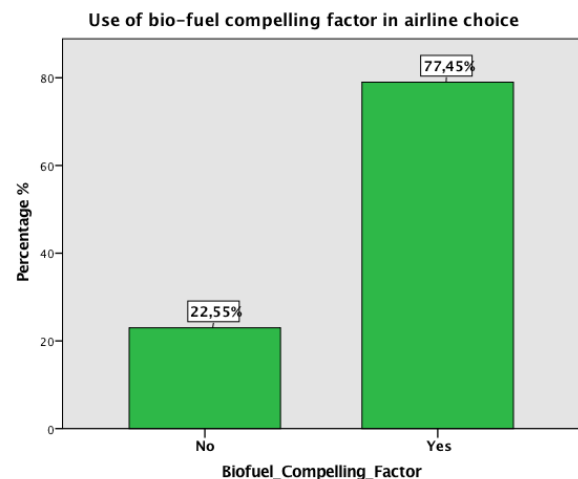


Figure 4.3: Bio-fuel compelling factor in airline choice.

This indicates that sustainable bio-fuel use by airlines is of importance to most of the air travellers that participated in this research, however, they are mostly unaware of the use of it by KLM.

##### Biofuel compelling factor

In Appendix 4.1 the result of two cross tabulations can be found (Age groups\*Biofuel\_Compelling\_Factor; Flying\_Purpose\*Biofuel\_Compelling\_Factor). These tables show if there are striking variances in whether people feel bio-fuel is a compelling factor in their airline choice according to their age or flying purpose. From the first table it can be concluded that the younger age groups find bio-fuel a more compelling factor in their airline choice than the oldest 2 age groups. In the youngest three age groups representing people from 16-45 years old, the vast majority (85,3%, 78,6% and 90,9%) indicated that bio-fuel use would be a compelling factor. The two older age groups representing people from 46-69 years old, were evenly divided in their answer (50% and 42,9% Yes).

The second table compares people's flying purpose and the question whether they find bio-fuel a compelling factor in their choice of airline. What stands out is the fact that 82,9% of the respondents whose predominant flying purpose are holidays find bio-fuel a compelling factor. Whereas for the business travellers this is only 54,5% and for people merely visiting friends and family this is 58,3%, thus considerably less than holiday travellers.

#### General attitudes towards sustainable aviation initiatives

Figure 4.4 shows the weighted average of all responses given to each of the statements in the survey. These statements were measured on a 5-point Likert-scale where 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5=strongly agree. Out of this figure a lot of information can be derived. First of all, the statement that people agreed with the strongest was that airlines do not communicate enough about sustainable aviation efforts (average 4.28). This is in line with the previous outcome that most people were unaware of the fact that KLM is investing in sustainable aviation fuels for their flights. Relatedly, people on average disagreed (1.70) with the statement that there is enough information about aviation and sustainable bio-fuel being spread, and thus feel there is a lack of information on this topic.



Figure 4.4 Weighted average for each of the statements (1=strongly disagree - 5=strongly agree).

Next to this, people agreed-strongly agreed with the first statement 'sustainable bio-fuel driven flights are a good environmental initiative'. In line with that, on average, respondents indicated that they do believe in the concept of sustainable aviation, which is maybe also a reason why they think that bio-fuel

driven flights are a good initiative. When it comes to responsibility, it can be seen that participants feel it is the responsibility of airlines to invest and make flying more sustainable (4.11). Concerning their own responsibility, travellers indicate that they do feel a degree of responsibility to choose a sustainable flight once they are offered (3.63), however to fly less in order to mitigate emissions is less favoured (3.07).

### Information and Communication

To zoom in on the views regarding information and communication of sustainable aviation efforts, the following graphs give a detailed insight. When it comes to the factor information, it seems that the vast majority of the respondents feel that there is not enough information about bio-fuel and aviation being spread. At least 92,16% of the respondents felt there is currently a lack of information around this topic

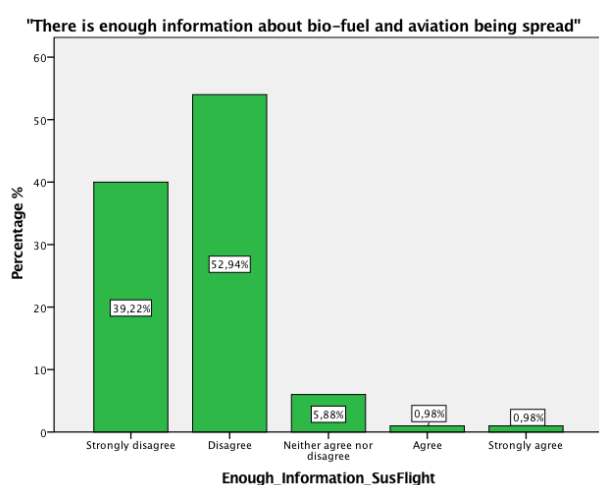


Figure 4.5 Information regarding bio-fuel.

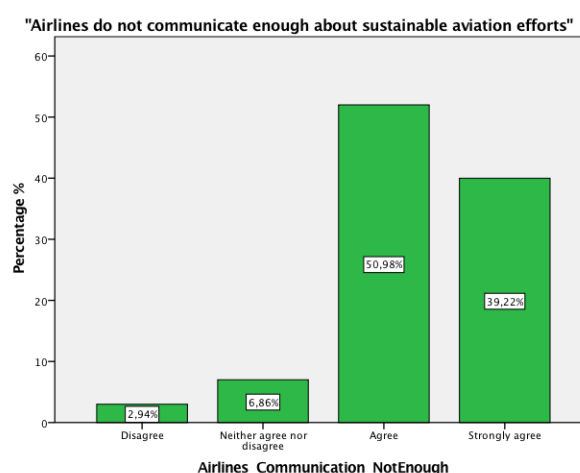


Figure 4.6 Airline communication about sustainability efforts.

Concerning the communication of sustainable efforts by airlines themselves figure 4.6 shows the opinion of the participants. The graph shows that also the large majority of the travellers (90,2%) perceive there is not enough communication around the sustainable aviation efforts by airlines. These two statements are not specified to the case of KLM. However, as almost everyone feels there is a lack of information and communication in general, plus, most of these respondents also did not know about KLM's investments in bio-fuel the results are also applicable for KLM.

### Environmental conscious travel behaviour

The two statements aiming to directly measure political consumerism behaviour in the case of sustainable aviation; "I would make an effort to purchase a flight ticket from an airline that invests in sustainable aviation" and "I will not buy a flight ticket from an airline which does not invest in sustainable aviation" were transformed into a new variable. Computing a new variable based on the mean scores of both these statements combined aims to give an indication of possible political

consumerism behaviour in aviation amongst the respondents. Before making this index, a reliability analysis has been performed which will be explained in the grey box 4.1 below.

*Box 4.1: Reliability analysis*

It should be mentioned that a reliability analysis has been performed when computing the new variable 'Political Consumerism'. This has been done in order to reveal whether the two statements involved are in fact related and measure similar behaviour, in this case political consumerism. Cronbach's alpha has been calculated for internal consistency for the two variables "Consumer\_Effort" and "Will\_Not\_Buy\_Non\_Susflight". The number should be between 0-1 and the higher the score the greater the internal consistency and more reliable the generated measurement is. In this case, Cronbach's Alpha is ,415. Criterion to determine the acceptable level of reliability are varied, however, a common accepted level is 0,7 and higher (Heale & Twycross, 2015). It can thus be assumed that the internal consistency of the two variables is poor.

Based on the performed reliability analysis it can be concluded that the two statements aiming to measure political consumerism behaviour are not reliable enough to form the index of political consumerism. A reason for this could be that the study by Shah et al. (2007) on which the measurement statements are based, used a third statement "*I have boycotted products and companies in the past*". If this statement was included in the measurement index, Cronbach's Alpha would probably be higher. This statement was however not used in this research as it would have to include an explanation of what a boycott is and assumes boycotts are already taken place in the aviation sector.

To measure a latent form of political consumerism behaviour in air travel, a new measurement index can be made, adding statements to the previous discussed two statements. Two statements that are added "*I feel responsible to choose a more sustainable flight-route now they're offered*" and "*I feel the responsibility to fly less to mitigate my own CO2 emissions from flying*" refer to feelings of responsibility in towards more sustainable aviation. These statements are relevant as in the literature came forward that political consumerism is about taking responsibility in a good manner (Micheletti, 2003) and environmental-responsibility taking is a factor in political consumer choices for travellers (Joran et al., 2011). Lastly, the statement "*As airlines invest in sustainable aviation, I intend to make more environmentally conscious travel choices as well*" is included in the measurement index as it refers to the interplay of providers and consumers in facilitating political consumerism behaviour.

The measurement index for political consumerism behaviour in air travel is now based on the following five statements; "*I would make an effort to purchase a flight ticket from an airline that invests in sustainable aviation*"; "*I will not buy a flight ticket from an airline which does not invest in sustainable aviation*"; "*I feel responsible to choose a more sustainable flight-route now they're offered*"; "*I feel the*

*responsibility to fly less to mitigate my own CO2 emissions from flying”; “As airlines invest in sustainable aviation, I intend to make more environmentally conscious travel choices as well”.*

In this case, Cronbach’s Alpha is **,784**, considerably higher than ,415 and above the acceptable level of 0,7 which thus means there is reason to believe these statements measure the same behaviour. It can thus be assumed that these statements together better indicate possible political consumerism behaviour by the respondents, therefore, a new variable has been computed based on these findings (Figure 4.7).

The graph shows the frequency outcome in percentages of the newly computed variable ‘political consumerism2’ which is measured on the scale 1=strongly agree to 5= strongly disagree. Firstly, as can be seen on the right side of the graph, the mean score of the variable Political consumerism2 is 3,29, which indicates that on average people are neutral (neither agree nor disagree) in latent political consumerism in air travel. The percentages of the scores 3,5 and higher are added up as they would represent the group of respondents which agree with statements indicating political consumerism. The total of these scores (Appendix 4.2) is 42,2%. Showing that 42,2%, a considerable amount of the respondents, are positively inclined to make political consumerism choices in their air travel behaviour.

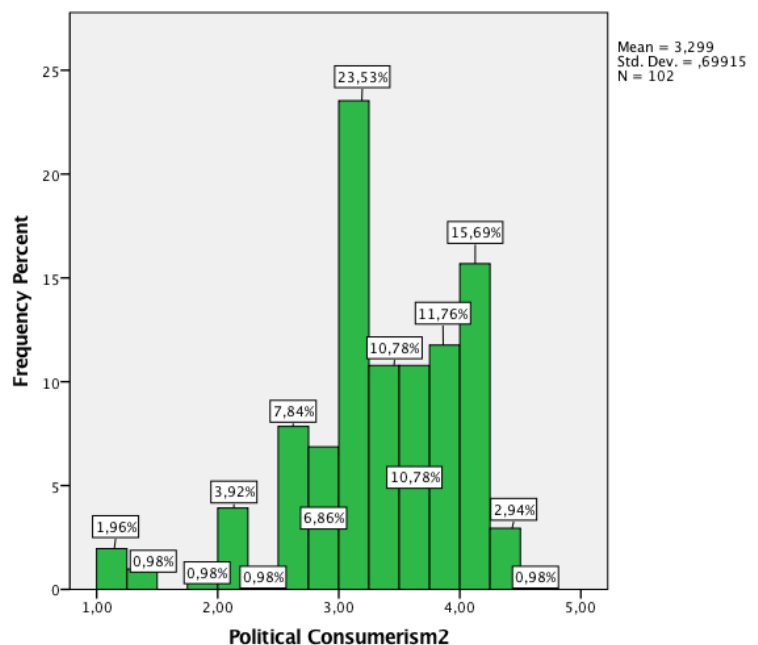


Figure 4.7 New variable political consumerism

Something that stood out in the results was the willingness of the participants to make more environmentally conscious travel choices as they know airlines invest in sustainable aviation. The frequency outcome of this question can be seen in figure 4.8. At least 70,59% of the respondents claimed that they intend to make more environmentally conscious travel choices. Only a small amount of 6,86% of the respondents stated that they would not want to re-think their own travel choices.

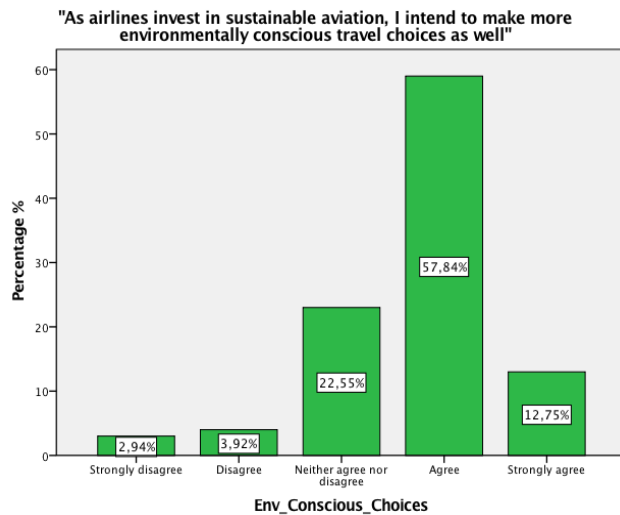


Figure 4.8 Environmentally conscious choices.

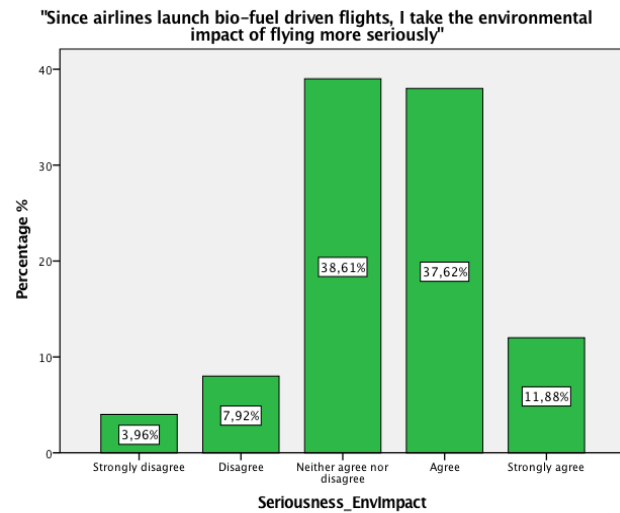


Figure 4.8 Taking impact of flying more serious.

Considering the impact that airline investment in bio-fuel has on the overall awareness of the environmental impact of flying, figure 4. provides some insight. Notably, the percentage of people that agree with this statement is considerably lower than people wanting to change their behaviour. Still, 49,5% of the participants would say they take the environmental impact of flying more serious when seeing more flights on bio-fuel. However, the amount of people that are neutral or disagree with this statement might already be aware of the environmental impact of flying anyway, which is not known.

The results of the survey show various interesting insights concerning air traveller perceptions of sustainable aviation initiatives and in particular bio-fuel use, and how these relate to pro-environmental air travel choices. The next chapter will logically focus on KLM's involvement in sustainable aviation and anticipations of their newly introduced Växjö flight. In this way both the consumer as well as provider side in a transition towards more sustainable aviation is reflected. These findings will be connected in a discussion in the chapter Turbulence.

## 4.2 Interview Results

The results of the interviews are presented according to the following major themes; Project set-up; Communication & Information; Aviation and Environment Discourse; Environmental Commitment KLM; Traveller Anticipations; Biofuel Complications; and Cooperation.

### 4.2.1 Project set-up

In regards to the project set-up of the new Växjö-route, two important subjects were identified; the objective of the sustainable flight and the organization behind the sustainability construction of the flight.

#### Objective

To begin with, KLM first decided that they wanted to open a new route to the Nordic region. When it was certain that Växjö was going to be the destination, quite quickly it was discussed how this route can be made more sustainable. A reason for this is also that Växjö was announced as the greenest city of Europe in 2018 and sustainability is high on the agenda in this town. Considering the goal for making the flight to Växjö more sustainable, the following main reasons were mentioned.

Firstly, several interviewees mentioned that a reason behind the sustainable flight was to position KLM as a sustainable airline. In this way, consumers should become increasingly aware that KLM is being more responsible. In the light of environmental efforts, an interviewee explained that not much people know about KLM's efforts and see other airlines unrightfully as more sustainable, and therefore they wanted to defend their position in the market.

*"I think we wanted really to position ourselves in the Nordic and Swedish market as an important player in this game. (...) because we know that we have much better victory when it comes to this kind of initiatives and we have a lot more experience as well." (KLM-MC)*

Secondly, a reason for initiating a more sustainable flight was to raise more awareness about sustainability in the aviation sector and to get the message across that it is not that easy to make aviation more sustainable. In this way, the new Växjö flight can be an example of what can actually be achieved:

*"So we see this initiative as a pragmatic showcase about what we can actually do in terms of sustainable aviation, and we try to be as clear as possible." (KLM-GM)*

This does not only have to do with reaching the consumers, as it is often mentioned that the flight is as well about challenging the market. The participants expressed multiple times that the aim is also to get more airlines involved in initiatives like this and hopefully they will start to invest in biofuel as well; *"we would have hoped it would trigger more action also from other airlines" (KLM-GM).*

Lastly, the feasibility study on locally producing bio-fuel is mentioned as the objective of the project. Both the Växjö airport representative as the municipality representative saw this as the most important issue, which is perhaps logical as it has to do with the development of their region in which the local community is involved.

*“So by doing this we can probably see the results later on, to have our own fuel later on.”*

*(Municipality)*

Furthermore, the feasibility study is a project that concerns the future of producing bio-fuel and seems also highly valued by KLM; *“In the end preferably you want to produce biofuel locally, that is what we aim for.” (KLM-GM).*

### Construction

The construction behind the ‘green flight’ of KLM is not that straight forward and is important to discuss since it encompasses how bio-fuel is being used by airlines nowadays. It also exemplifies how a ‘sustainable flight’ is being marketed towards consumers and therefore possibly shapes their understanding of such initiatives.

What is striking about the use of bio-fuel for the Växjö-route is that it is not actually being used on the flight between Amsterdam and Växjö. For making the Växjö-route more sustainable, KLM wanted to show their commitment to increase the share of bio-fuel. Since the production place of the approved bio-fuel for jets is in Los Angeles, KLM decided not to ship bio-fuel to Europe but to use this alternative fuel for flights fuelling in LA;

*“We want to reduce CO2 world-wide and then we are going to ship it from one place to another because of marketing reasons. That’s not the right message we think.” (KLM-SUM).*

Thus the 5% of bio-fuel that is being ‘used’ for the Växjö-flight means that KLM calculated how much 5% of the fuel used for the Växjö-route is, and purchases that amount in bio-fuels in LA. For KLM it is now essential that the share of bio-fuel is increased not so much where that is being done, and claims that is also how they communicate it to the public. Another interviewee also confirms that KLM is communicating clearly about this; *“We have never hidden the fact that we are not actually transporting the fuel and putting it into the Växjö plane. I have mentioned it myself several times in press or speeches.” (KLM-GM).* He further explains that usually the reactions are positive and people understand that it is the most logical thing to do. However, if one might quickly read about the new flight in a news article or on the KLM website it might be less clear to them as the whole construction is not explained thoroughly. To buy certain amount of bio-fuel and then allocating this to a flight-route is according to



the Växjö airport representative the ‘common way’ in aviation. Other airlines in Sweden are doing similar things and he also feels that people understand this construction.

The project set-up with the local community of the Växjö region is considered unique by both KLM, the airport and municipality representatives, “*we are the only airport with KLM who is flying with this full 100% compensation.*” (Airport) The parties are proud that they are working together to make this happen and value the feasibility study which investigates the future of bio-fuel production in Småland. An interviewee explains that last autumn another Swedish airline has set up a similar cooperation with an airport;

*“SAS together with another domestic carrier, the two of them made a cooperation at an airport next to us and they copy pasted out set-up. (...) they are helping to get more biofuel and of course to get this more higher up the agenda.” (KLM-MC)*

Another employee gives an example of a local airline which also started to allocate 5% of bio-fuel to their flights and is pleased that the Växjö project seems to have a sort of ‘spin-off effect’. The airline thus does not see the usage of bio-fuel as a competition but rather something that the whole sector should engage in.

#### 4.2.2 Communication & Information issues

There were multiple issues that came to light when analysing the interviews concerning communication and information. This is a very widespread theme in which different subthemes are discovered and which will be elaborated on in this section.

##### Communication Växjö flight

The specific communication and marketing around the new Växjö flight-route seemed inadequate. Overall, the interview participants expressed that there was not much communication around the new flight route concerning its sustainability character. This was even considered as a ‘gap’ or problem in the project:

*“(...) not everybody knows so I think that is actually our gap or problem that not everybody knows that it’s a sustainable flight. We talked about it in a few articles, and we mention it but there is not really a campaign around it. So again I think it could be more.” (KLM-SUM)*

All interviewed employees of KLM were of the opinion that there should be more communication and marketing towards consumers around the flight route and the fact that it is the most sustainable flight that KLM is offering right now. There are several things that seem to have to do with a lack of communication around the flight-route according to the interviewees. First of all, Växjö is a small destination where only one flight per day is flying on. If it was a major destination which was going to

have a sustainable route there was probably more communication and marketing attention around it. Also, the way how to communicate about the Växjö flight-route seems a difficult thing to do. Framing it in the right way so that people understand what is being done on an environmental level is not that easy for an airline: *“You can say things in such a way that it can be approached differently, in a negative way for example. So you need to control how are people explaining about it to control the content.” (KLM-SUM)*. She refers to the sustainability construction of the Växjö flight as an example of sending the right message to people. First, the option was to ship jet biofuel from Los Angeles where it is produced to Sweden or Amsterdam to put in the flight. However, to aim for a reduction in CO<sub>2</sub> worldwide and then ship biofuel from the US to Europe just for marketing reasons would not send the right message.

There seems more promotion for the actual new line than there is about its sustainability character. The airport of Växjö expresses that they focus more on the compensation and the feasibility study of local bio-fuel production:

*“I think we are not so good at marketing the 5% bio-fuel when we talk about it, but we more talk about the compensation and the project (feasibility study).” (Airport)*

There seems to be a difference in opinion on how to frame the flight between KLM and the Växjö airport. Whereas the term “green flight” is not preferred by KLM: *“(…)we don’t advertise it as ‘green flight’ but as our most sustainable flight” (KLM-GM)*. The representative of the Växjö airport does in fact explain that they are marketing the route as a green flight: *“The airport has to be quite environmentally thinking, so the challenge for us was to market it as a green flight.” (Airport)*. This might reflect the modest strategy of KLM in communicating about environmental efforts, discussed in the next paragraph.

#### Communicating about sustainability in general

Next to specific communication issues related to the new Växjö route there was also a strong expressed difficulty in communicating about sustainability in general as an airline. This is also reflected in the way that the sustainability manager refers to the term “greenwashing” as a possible threat when the actual sustainability content of environmental efforts is not ensured. To talk about sustainability issues as an airline is particularly tricky in Sweden as people are increasingly opinionated about climate change, the environment and the impact of flying: *“ (...) people are very opinionated about airlines, and they really believe that airlines are the worst polluters. So to talk about this as an airline it needs to be done in a very open and frank way.” (KLM-MC)*. It seems that to communicate about environmental efforts as an airline requires a strategy as it is such a sensitive topic and people in Northern Europe are more and more opinionated about it. The general manager of the Nordic region explains how KLM is approaching this:

*“When it comes to communicating about our sustainability efforts there is a hard balance. You want to tell everybody what things you are doing and show your commitment but it might be perceived as arrogant. So now we just want to show realistically what we are actually doing and do it in a modest way.” (KLM-GM)*

Thus the communication strategy of KLM for environmental efforts might be characterized as realistic and in a modest way.

#### Consistent communication among airlines

Something that was mentioned as an important aspect in communicating about sustainability in aviation was that airlines should use the same concepts when talking about sustainability issues. Interviewees explained that after the Vaxjo project was launched, a local Swedish airline did a similar project with buying 5% of bio-fuel for a certain flight route. This sort of “spin-off effect” from the Vaxjo project was seen as a positive thing.

*“That more airlines start doing the same thing and using the same kind of branding and concepts that we did which is important and that is kind of what you want to do.” (KLM-SM)*

Furthermore, it was often stated that there is a need for more environmental efforts by airlines and that they especially need to communicate more about it. Which is notable since as previously mentioned KLM employees feel that there is a need for more communication around the Vaxjo flight as well.

#### Information

The sustainable flight-route to Vaxjo might provide a setting in which travellers can be informed about environmental issues in aviation. Some participants expressed that the unawareness of people about flying and the environment possibly has to do with an unwillingness to know the negative impacts of flying. When seeing information about aviation and bio-fuel solutions in another place than regular news, provided by the airline itself, this might contribute to more awareness. As expressed by the sustainability manager:

*“Our Dutch newspapers are full of information on how bad it is for the environment to fly, but not everybody reads that or skip it because they are not interested. But maybe if people see this sort of info in another place, when booking there flight or reading their magazines they will see that there is something.”*

Another interviewee expressed that by advertising bio-fuel and sustainability as an airline it is more likely that people are affected by this. Again, it is striking then that for the Vaxjo-flight the use of bio-fuel is not greatly advertised.

#### 4.2.3 Discourse Aviation and Environment

During the interviews it became clear that the interviewees all used a similar way of talking about aviation and its relation to environmental impacts and mitigation. Both for approaching aviation in general and for approaching the meaning of the Våxjö project for sustainable aviation the same kind of language was used among the respondents. This is valuable to discuss as it expresses the view of an airline about its environmental responsibilities and role. Furthermore, in the literature it came forward that airlines seem to use a certain discourse regarding environmental issues, which thus can be compared with the discourse of the KLM interviews.

##### Aviation and environmental impacts

When discussing the change needed to mitigate negative impacts from aviation almost all interviewees pointed towards the value of aviation for society. Firstly, the economic value of aviation was used as an argument of why aviation was necessary for globalization and businesses.

*“Same goes for leisure passengers, you need to travel since more than 10% of all the workforce in the world are affected by tourism. You can image what would happen if we stop travelling.” (KLM-SM)*

Next to this, the social benefits of aviation was often used as an argument of why aviation should not be restricted and made substantially more expensive to limit growth numbers. Some interviewees referred to the role of aviation in bringing people happiness and entailing a social function in the world:

*“Aviation has brought a lot of good things, it is about connecting people. In my view it will also limit people’s happiness not to be able to travel and see the world.” (KLM-GM).*

Sometimes even a step further was made and an interviewee expressed that people who travel and go abroad and see the world are the ones that broaden their horizon and eventually have a better impact on society.

Next to the societal value of aviation and travelling, often a reference towards technology was made when discussing the future of aviation. The assumption that technology can serve as a solution for mitigating the environmental impacts of flying was often mentioned. As well as airlines will continue to develop innovations themselves to operate as efficient as possible. *“(…) technology will develop and we will have less emissions in general.” (KLM-SM)*. A positive view towards the future of aviation by virtue of technology was clearly expressed by multiple interviewees.

*“For all energy needs there can be a technology breakthrough and maybe that will happen for aviation as well, but probably it takes longer.” (KLM-GM)*

Related to this technology fix was the view that the aviation sector is already highly aware of the environmental problems in the industry. It was mentioned that the airline sector is putting a lot of efforts into sustainability measures. Lastly, aviation was seen as treated unfair in relation to other industries and their pollution. The representative of the Växjö airport explains that he feels aviation is seen as the “*black sheep*” as society and industries are pointing towards flying and not looking into their own sector for improvements. He feels that the discussion is twisted since the steel industry and food industry account for many more emissions.

*“(...) so I told the government and the audience why start in this end of 2% when you can make 5% of the food industry and 5% is more than two. You have to start at the right direction. (Airport).”*

#### Conceptualizing of Växjö flight

What was striking to see in the interviews was that all of the participants used the terms “step” or “start” to refer to the new Växjö flight-route and its meaning for sustainable aviation. The Växjö flight-route combining compensation and 5% of sustainable bio-fuel is thus seen by the initiators of the project not as an end stage of sustainable aviation but rather as a start or intermediate step in the process.

*(...) if CO2 compensating is the **way forward** then that’s what we need to start. If we can **start** there and develop that we can compensate to reduce our emissions. (KLM-SM)*

*(...) I think we are **on a good track** with something really good.” (KLM-AM)*

*(...) I have never regretted the decision to do this for a moment even though it is only a **small thing in the transformation** towards sustainable aviation.” (KLM-GM).*

*This is one of the **first steps** to see if we can make air travel a bit more environmental friendly. (...) there will still be flights and we need to make them as good as possible and this is a start. “But still it is a good step, you need to start walking, there is always a **first step**.” (Municipality)*

Also, the feasibility research that comes out of the Växjö project is seen as a valuable step in the process of sustainable bio-fuel use in aviation. *“There should be more research in the world, if you don’t do that research you will not come a **step further**” (KLM-SUM).*

#### 4.2.4 Environmental commitment KLM

A theme that was important throughout all the interviews was the environmental commitment of KLM. The sustainability policy of KLM in general was often referred to, the companies’ commitment towards bio-fuel in aviation, their responsibility towards mitigating emissions and the importance of the Corporate Bio-fuel Program in their strategy.

#### Expressed sustainability commitment

The communicated strategy of KLM is to integrate sustainability throughout the whole organization. The interviewed employees all expressed a sense of being proud of the environmental efforts of KLM. In comparison with other airlines they thought of KLM as being ahead of them in terms of sustainability measures and the sustainability program was seen as a big priority:

*“We think at this moment, what we do on sustainability is a unique selling point because others in the airline industry are not that far.” (KLM-SUM)*

Several interviewees expressed their concern that aviation has become “ridiculously” cheap in comparison to other transport sectors. It was even seen as an option by the airline itself to make flying more expensive to invest that into sustainability measures, *“It would be realistic to make aviation a bit more expensive and invest that in biofuel.” (KLM-GM)*. The Växjö airport representative was also extremely positive about KLM and its environmental commitment and was proud to cooperate with such an airline; *“we love KLM (...)”, “to have a company like KLM with green thinking (...)”, “(...) KLM is very green.” (Airport)*.

#### Commitment bio-fuel

The results of the interviews indicate that KLM as an organization expresses strong commitment towards the development of bio-fuel for aviation. The Sustainability Manager explains that when discussing the sustainability construction of the Växjö flight-route, the organization did not only want to invest in CO<sub>2</sub> compensation, but *“we thought no we want to do something with sustainable bio-fuel as well and show we are committed to increase the share.” (KLM-SUM)*. The organisation also seems to show its commitment to the development of bio-fuel by participating in the feasibility research to see whether production can be realized in the area of Växjö in Southern Sweden. Together with all the other stakeholders the letter of intent indicated that all companies were committed to contribute to the feasibility study. When discussing the future of bio-fuel and the possibility of expanding a project like the Växjö flight to other routes, a KLM employee expressed: *“We would love to do this in at least one place in every country, so one in Norway and one in Denmark.” (KLM-MC)*. This is however in the context of the Nordic region of Europe, but shows the ambition of the organization. Furthermore, to indicate the strong commitment of KLM towards the use of bio-fuel and playing their role in developing a market for it an interviewee stated:

*“When it comes to biofuel for aviation, I believe KLM is using half of what is being produced now.” (KLM-GM)*

#### Responsibility

The issue of responsibility as an airline towards environmental measures came to the fore often. When discussing who was responsible for initiating change in the airline sector, airlines, governments or

consumers, not surprisingly participants felt it was a shared responsibility. It seemed however, that most of the KLM employees did assign great responsibility to airlines themselves for mitigating emissions. Especially when it comes to the uptake of bio-fuel it was clear that the airline saw their role in advancing this solution:

*“(...)someone has to make the first step, so I think we are on the good way but it takes time and we need to speed things up. And KLM an Air France have a big responsibility for making it happen with biofuel.”*

*(KLM-AM)*

Also, when considering who was actually the initiator of change in the sector, some interviewees expressed that they felt KLM was in this case the initiator. As the municipality representative indicated, *“Airlines must consider in what way can we make our flights more sustainable, that is what KLM has done. I feel that KLM is really interested in this and want to do this (...)”*. *(Municipality)*

#### Importance Corporate Bio-Fuel Program

It became clear that the Corporate Bio-fuel Program is a very important component in the environmental strategy of KLM as well as the Värmdö project in particular. Since KLM has a large corporate consumer base it has become a strategy to involve companies and use their investment to increase the share of bio-fuel. The interviewees explain that this has been a well thought-out strategy since approaching corporate works better than to approach the leisure traveller to cover for the differential costs between normal kerosene and bio-fuel.

*“Also the reason we are approaching corporate is because we want to do it at a bigger scale, we can approach companies and say if you want to reduce emissions look at your travels and we can help. For the leisure passenger I think it is a little bit harder.”* *(KLM-SM)*

Since the corporate bio-fuel program is such an integral part of KLM's commitment towards bio-fuel, an objective of the Värmdö-route is also to expand the program internationally, in Sweden, and get more companies involved.

*“So through the Värmdö route we have signed now 1 company, Södra, and in the coming weeks the second one.”* *(KLM-GM)*

*“We are working hard on it to get more Swedish members in the CBP but so far I think we are still one, Södra that is the only.”* *(KLM-MC)*

#### 4.2.5 Traveller anticipations

When discussing expectations of traveller or consumer perception about the bio-fuel driven flight several issues were identified by the interviewees. These issues also have to do with consumer behaviour and sustainable aviation in general and provide insight into presumptions that KLM as an airline has of its air travellers.

### Consumer response towards bio-fuel driven flights

When conducting the interviews, the Växjö-flight was going for half a year, interviewees thus explained what they knew up until then about how consumers of KLM reacted to the introduction of a new sustainable flight-route. Also, they shared their expectations of how air travellers would respond to it.

Considering actual reactions to the new Växjö route, it was mentioned that people were mostly interested in how this flight came together. One of the KLM employees explains that she feels reactions are mixed, on one hand there are positive reaction from people; *“we have had positive comments like ‘oh I did not know that you are doing this, this sounds great’.”* However, people also expressed scepticism as they found it weird that an airline was doing such things. Other employees explained that they feel that people do not know about the sustainability character of this flight and therefore they cannot say much about the responses they have heard until now. This lack of awareness can be connected again with marketing and communication as discussed before. From the citizens of Växjö point of view, the Municipality representative explains that he thinks people do not care that much about the sustainability of the new flight:

*“I have not heard anybody say big things about it, I mean from the citizens, I think instead of ‘wow we have a sustainable flight’ it is ‘wow we have a connection to Amsterdam’.” (Municipality)*

Moreover, a lot of interviewees also expressed that they feel that people are not that interested in bio-fuel use by airlines and that they also do not know much about the topic. This line of thought by KLM as an organisation is interesting to compare with the survey results of traveller opinions.

*“We hope to make a difference in the future, but at this time I do not think people care that much about bio-fuel.” (KLM-AM)*

Interestingly, some interviewees did express that they think air travellers are ready for initiatives like bio-fuel driven flights to pick up on it. Even though this might still depend on the market, as the sustainability manager feels that Dutch and Swedish people are and other less developed countries are not. When discussing the possibility if the new Växjö flight route could potentially initiate a boycott of sustainable flights there were mixed opinions. Some think or hope that the sustainable flight would make people more willing to purchase a flight ticket because of that. Whereas others think that travellers will definitely not purchase a ticket because of its sustainability character, since the destination and the price will always be leading. Next to this, someone mentioned that if more airlines would start developing flights like this, there would be more attention to it and possibly a boycott could happen.



### Choice

The words 'option' or 'choice' were often repeated when discussing the sustainable flight in relation to air travellers. Even though all interviewees expressed that the reason for making the flight more sustainable was not based on pressure from citizens, the fact that this flight is a new more sustainable option for air travellers seems important. To have a greener option to fly does create awareness about the environmental impact of flying in general and thus people might consider other flights as more environmentally destructive:

*"Because of this flight is existing, people will get aware that there is a greener option, then there should be something (wrong) with the other option, right? If you start having a sustainable option, all the other options are not sustainable." (KLM-SUM)*

Furthermore, the issue of having a choice, and letting people know that they have a choice to fly more sustainable seems important. Some interviewees did mention that if more airlines would start doing similar efforts and communicate more about it, having a choice between sustainable and not sustainable flights will become more clear to people:

*"(...) then hopefully people would at least put them in two categories; 'these airlines do something about sustainability, these airlines don't' and the choice would be between those two categories." (KLM-SM)*

However, other interviewees were of the opinion that people whom are environmentally conscious and would like to travel more sustainably, would not seek for the most sustainable flight but would then search for other travel modes and go for example by train or bus.

### Sustainable travel behaviour

Whether flying with a more sustainable flight would also influence people's pro-environmental travel behaviour was seen as something that might happen in the future. For now, a more sustainable flight seems to have more of an awareness function, *"maybe it can be a starting point for people being more aware of everything they do during their travels"* (KLM-SUM). She also thinks that if people deliberately choose to go with the more sustainable flight, this might result in them booking a more environmentally friendly hotel. Others think that booking a more environmentally friendly hotel is something that is rather done than booking a sustainable flight, since flying is considered as environmentally unfriendly anyway and taken for granted. Another employee feels that pro-environmental behaviour will become a key element in consumer choices and thus will also influence travel behaviour in the future.

The difference between environmental awareness/attitudes and actual behaviour is often touched upon as a problem in involving travellers in sustainable aviation. *"People are talking very much about it, but they do very little about it when it comes to themselves."* (KLM-AM) Interviewees feel that people

actually do know about environmental impacts of flying and its relation to climate change, but the mind-set that travel is supposed to be cheap stands in the way.

### Implications

Interviewees expressed several overall difficulties when it comes to consumers and their interest in sustainable aviation initiatives. As mentioned in the previous paragraph, the mind-set of people that air travel is supposed to be cheap is considered as an important barrier in making aviation more sustainable. If bio-fuel use by airlines is going to be scaled up, an option would be to make ticket prices more expensive to be able to purchase the more expensive alternative jet fuel. This seems however almost impossible if not all airlines will do the same thing as people will go for the cheapest ticket.

*“The problem I think, is the mind-set, what people brag about the most when they go on a holiday is how cheap the ticket was, that is almost more important than how beautiful the destination was.” (KLM-SM)*

As explained by the general manager of the Nordic region, if one airline is investing in bio-fuel and therefore their tickets will be more expensive it is likely that they will lose market share to other cheap airlines who are actually polluting more. Which results in a counter effect, as these airlines try to do good but others are benefitting as they offer more cheaper tickets. He feels that in the future it will be; *“price sensitive vs environmentally sensitive people.” (KLM-GM)* The airport representative also adds that people in Sweden are still very price sensitive but are *“struggling between prices and morals”*. Next to this, interviewees almost all mentioned that sustainability is not the most important in flying, people will want to fly to their destination of choice.

The outcomes of the interviews with KLM employees and the survey with air travellers present a lot of interrelated factors at play in the process towards more sustainable flying. Therefore, in the next turbulent chapter the results of the interviews and survey will be compared and a discussion will show how they relate to each other. Moreover, references to relevant literature will be made to put the research into wider debates, and it will be argued what the findings of this study add.



## 5. Turbulence

*This chapter represents the discussion of the results; the findings of the interviews, and the survey are compared and connected with consulted literature. This section thus places the findings of this study in wider debates and reflects on the whole research.*

In this thesis, the following main research questions has led the way “*What is the role of airlines and air travellers in a transition towards a more sustainable aviation industry and how does their interplay manifest in bio-fuel initiatives*”. For this matter, there are a number of striking results that need some thorough elaboration.

When it comes to the perception of air travellers towards sustainable bio-fuel driven flights a few important issues can be discussed. Firstly, from the survey results it seemed that the respondents showed a general positive attitude towards bio-fuel driven flights. As on average people agreed that sustainable bio-fuel driven flights are a good environmental initiative. At the same time, results show that the vast majority (77%) of the surveyed air travellers declares that bio-fuel would be a compelling factor in their airline choice. This is noteworthy as most of the interviews showed that KLM employees think that people do not care about bio-fuel use in aviation and feel people are often sceptic towards sustainability efforts by airlines. As the airport representative states people in Sweden were more impressed with having a connection to Amsterdam than having a sustainable flight, and KLM employees have heard judging comments why KLM as an airline would talk about sustainability and bio-fuel. In the study by Becken (2007) it was also highlighted that people often perceive environmental initiatives by airlines as greenwashing or advertising and mistrust airlines because of their economic objective. Whether the surveyed travellers in fact trusted the specific initiative by KLM was not investigated, which forms one limitation due to not being able to distribute the survey under Växjö flight passengers. However, the major support of bio-fuel initiatives indicates that the respondents would have trusted the initiative.

Thus, people showed a general positive attitude towards sustainable bio-fuel use by airlines, though, for the case of KLM at least 73% of the respondents did not know that the airline is investing in sustainable jet fuel. This lack of awareness that the flight to Växjö is ‘a more sustainable flight’ was also pointed out by many employees in the interviewees, as such these findings match up. In fact, lack of awareness of the investment in sustainable jet fuel and the Växjö-route is seen as a gap by KLM itself and relates to minimal marketing and communication efforts around it. The airline speaks openly about how difficult it is to communicate about sustainability efforts in the aviation industry as public opinion has become fierce and critical. The strategy that KLM chooses for communicating about its environmental efforts is described by the general manager of the Nordic region as in a ‘realistic and modest’ way. Multiple employees argued that there was not much marketing and communication for the sustainability aspect of the Växjö-route. Conversely then, literature as by Becken (2007) also finds that air travellers are of

the opinion that airlines should provide more and profound information on their environmental performance.

So there seems to be a mismatch, as has been revealed in the survey, people do in fact care about bio-fuel use in aviation but they are in this case simply unaware of the efforts by KLM due to a lack of information and communication. The most obvious findings of the survey show that 92% of the respondents feels there is not enough information about biofuel and aviation being spread and 90% feels airlines do not communicate enough about their sustainability efforts in general. This is problematic as we have seen in literature on political consumerism that information and communication are key contextual factors for consumers to start acting upon their environmental, ethical or political beliefs in purchases (Shah et al., 2007). According to Scruggs et al., (2011) available information of the product characteristics and the availability or access to goods/services that are more politically desirable are essential aspects to facilitate political consumerism. In this manner, air travellers are also not able to make more environmentally conscious travel choices, as they are not aware of the greener options they have. Political consumer behaviour in aviation is maybe thus not stimulated by the airline sector itself as the greener options of flying are apparently not being greatly advertised to the public. KLM's strategy of communicating in a modest way about their environmental efforts is perhaps not sufficient to involve air travellers in a transition towards more sustainable aviation. When referring to the info flow model by Spaargaren & van Koppen (2009), there is no adequate information regarding the production-consumption chain of flights, here in specific the Växjö-route, reaching air travellers at the consumption junction, meaning that air travellers are not able to use this information to make their choices.

KLM does see potential in eventual "buycotts" of sustainable flights if more airlines will start doing similar initiatives with bio-fuel and communicate more about it. In that way, air travellers will be offered a choice between sustainable and not sustainable flights as they can ideally put them in two categories; airlines who do something about sustainable flying and airlines who do not, and the choice would be between those two categories. The aviation sector will then facilitate political consumerism in a similar way as in the food industry where people have a choice between clearly defined categories of differently produced foods. All of this might seem hard to achieve in the aviation sector, being a complex consumption sector. Though, as the results of this study indicate that 42% of the respondents are sensitive to or can possibly be engaged in political consumerism behaviour in air travel, there seems to be an opportunity in facilitating these consumer choices. Also, this is a striking finding as before aviation was seen as the key weak pocket of political consumerism (Lamers et al., 2018).

In the consulted literature on pro-environmental behaviour in tourism, it became clear that travellers generally show a positive attitude towards sustainable tourism but often do not behave alike, referred to as the well-known attitude-behaviour gap (Hall et al., 2013; Davison, 2014). KLM employees also often

referred to the gap between environmental awareness and behaviour as people are talking about the relation between climate change and air travel but not much act upon it. In particular, tourism mobility as air travel, seems a complex consumption form in which people do not prefer to make any adjustments for the greater good. The concept of the ‘flyers’-dilemma includes often held contradictory feelings as people are concerned about climate change but at the same time express their unwillingness to change rooted air travel behaviour (Higham et al., 2014). However in the findings of this study, it became clear that there was quite a strong willingness to make changes in one’s air travel behaviour, seeing airlines starting to invest in sustainable aviation solutions. At least 70% of the respondents indicated that they are willing to make more environmentally conscious travel choices as airlines start to invest in more sustainable aviation. It should be mentioned though that environmentally conscious travel choices might be interpreted differently by each individual, as it is not specified as flying behaviour. These results cannot be compared to the findings by Higham et al. (2014) that cost competitiveness is one of the main determinants suppressing climate change concerns in decision-making. Since in the survey the factor of price has not been included, nothing can be settled about the influence of ticket prices on the respondents’ willingness to make more environmentally conscious travel choices. However, it can be concluded that the surveyed people were generally open to adjust their air travel behaviour towards being more environmentally friendly. This is an interesting finding since no such observation can be traced back in any of the accessed literature.

The previous result also indicates that perhaps air travellers first want to see airlines take on action, after which they are more willing to re-think their own responsibility, involvement and actions. This line of thought can be connected to the study by Becken (2007) in which travellers claim airlines to be responsible for emissions. On the other hand, in the interviews it became clear that KLM as an airline feels that the mind-set held by air travellers that ‘flying is supposed to be cheap’ stands in the way of actual consumer changes. In fact, so called mind-set that air travel should be cheap was seen by many of the interviewees as one of the most important barriers in making aviation more sustainable. These outcomes indicate that air travellers as well as airlines rather put the problem behind making aviation more sustainable on the other party. Though, KLM asserts great responsibility to the airline sector for developing and upscaling the use of sustainable jet-fuel.

Another outcome which needs elaboration is the discourse on environmental issues expressed by the interviewed KLM employees. As pointed out in the literature review, the following four main discourses on environmental issues by the aviation industry were identified by Gössling & Peeters (2007);

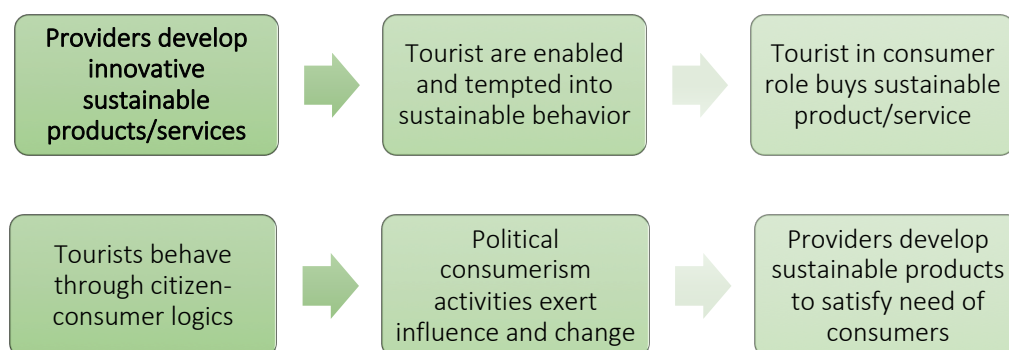
- (1) *Air travel is energy-efficient. Globally, it accounts only for marginal emissions of CO<sub>2</sub>.*
- (2) *Air travel is economically and socially too important to be restricted.*
- (3) *Environmental impacts exist, but technology will solve the problem.*
- (4) *Air travel is treated ‘unfairly’ in comparison to other means of transport.*

(Gössling & Peeters, 2007, p.405-406)

It is striking to see that all of these four discourses were also evident in the interviews with KLM employees and can be found back in the results section 4.2.3. The use of this discourse might influence people's perception of the environmental impact of aviation as explained by Gössling & Peeters (2007). However, as KLM has a clear environmental policy and communicates about its responsibilities and commitment towards sustainable development in the interviews, the usage of these discourses only weakens their efforts. While using these kind of denying discourses, but still showing commitment in the development of sustainable bio-fuel and other environmental efforts might confuse the public and influence their judgement on the credibility of the efforts.

Another discourse issue is the conceptualization of the Växjö-route and its influence on air traveller perception of sustainable aviation. All interviewees used similar language to talk about the Växjö-route as a sustainable bio-fuel initiative. The words 'step' and 'start' were repeated and conceptualize the meaning of the Växjö-flight. For KLM, this bio-fuel initiative is a step in right direction of sustainable aviation. The results show that the feasibility study on biofuel development in Växjö, is of great value in upscaling the use of bio-fuel. This side-project is referred to as a step in the process of increasing bio-fuel, but is not widely communicated to the public. The flight-route and bio-fuel in itself is not seen as an end stage by the airline but a step in the transition towards sustainable aviation, the question is whether this is clear to the air traveller as well. The sustainability construction of the Växjö-route is something which is also not that straight forward and might be misinterpreted by the public. As has been explained, a certain percentage of the fuel used on the Växjö-route is being re-purchased in biofuels, in Los Angeles. The sustainable jet-fuel is then used for flights there, as the remaining emissions of the Växjö flight are being offset through compensation projects. The complexity of all this together with minimal provided information of the initiative might have a negative influence on support of environmental efforts by air travellers.

Lastly, the two change processes towards more sustainable tourism mobility developed by Verbeek & Mommaas (2008) and included in the theoretical framework, can be used to conclude what process is at play in the case of Amsterdam-Växjö.



It seems obvious that the Växjö-route by KLM exemplifies the first citizen-consumer-led change process. In the case of this research, the transition process is not consumer-led, but actually provider-led. KLM as a provider has developed, without any direct pressure from the public, a sustainable innovative service; a more sustainable flight through bio-fuel and CO<sub>2</sub> compensation. Tourists, in this case air travellers, are now enabled into more sustainable air travel behaviour as they can buy a more sustainable flight. Whether the second transition path, led by political consumerism behaviour by air travellers, might occur in the aviation sector depends on the companies involved in the sector as much as on the air travellers themselves.

By applying practice theory concepts this research moves past the attitude-behaviour paradigm in order to connect air travellers and airlines and analyse their interplay which has an important influence on a sustainable aviation transition. The aviation sector is a complex industry for analysing the interplay between provider and consumer as flying is a contextualized consumption form. The influence of air travellers into changing this sector seems limited because there are little options to fly more sustainably and they are highly dependent on what initiatives airlines will develop. Further, questions in this framework arise about the power of governments and non-governmental organisations in stimulating a change in the aviation sector.

Lastly, as the theoretical framework provided an opportunity to analyse political consumerism in aviation, this study has thus added the idea of a latent form of political consumerism in the aviation sector to literature.



## 6. Landing

*This chapter involves the main conclusions of this thesis which will give answer to the defined objective and research questions. After this, the way that the research design has impacted the results will be acknowledged and lastly a few recommendations for future research will be given.*

### 6.1 Conclusions

This research has taken a look at the aviation industry in the context of climate change, industry efforts to minimize CO<sub>2</sub> emissions from flying and consumer involvement. As a focal point in the study, consumers as air travellers and providers as the airlines, have been investigated for their positions and influential power in the transition towards a greener aviation industry. The concept of political consumerism, in which consumers are exerting political influence by means of their consumption behaviour, provided a new perspective in analysing the role of airlines and air travellers in a sustainability transition and exploring how their interplay manifests in bio-fuel flights. Both parties have a strong impact on each other when it comes to steering the aviation industry towards a greener future, these circumstances will be highlighted in the concluding paragraphs below aiming to answer the research questions.

First of all, this research concludes that air travellers perceive sustainable bio-fuel driven flights mainly in a positive way and are supportive of it. This can be traced back in the outcome that travellers generally feel that bio-fuel use for flights is a good environmental initiative, and agree to believe in the concept of sustainable aviation. This favourable perception is also evident as the vast majority of the respondents states that the investment of bio-fuel by KLM has a positive effect on their opinion of the airline.

Seeing that air travellers have an overall positive perception of sustainable bio-fuel flights, when it comes to environmental behaviour, the following conclusions can be drawn. Travellers were open to adjust their air travel behaviour towards being more environmentally friendly, with some nuances involved. People attain great responsibility towards themselves in choosing more sustainable flights when these are offered, but feel less responsible to actually limit flying for mitigating emissions. The research shows that in general, people are prepared to make an effort to fly with a more sustainable flight, but on the other hand, they will not decline a ticket from an airline who doesn't invest in sustainable flying. From this we can deduce that certain conditions are attached to this consumer behaviour, probably as seen in literature and interviews with KLM cost-competitiveness is such condition. Also, convenience and time-efficiency are arguably important which depend on the supply of sustainable flights. Investing in sustainable aviation however, seems to be an important consideration in airline choice as 77,5% of the respondents state it is a compelling factor. Finally, it can be concluded that air travellers first want to see airlines invest in making aviation more sustainable, after which they



will consider their behaviour as well, showing a wait-and-see attitude that lies the ball in the court of the airlines.

Pro-environmental choices can manifest in political consumerism behaviour in air travel to stimulate a change towards more sustainable aviation. This research concludes that 42% of the respondents showed a positive attitude to behavioural indicators of political consumerism. This signifies a latent form of political consumerism for sustainable aviation, and thus a possibility in stimulating this behaviour. It can be stated though that in the investigated case, KLM does not appear to engage their travellers into such behaviour as three important factors influencing political consumerism; information, communication and a wide availability of responsible options, are not deployed. One of the most evident conclusions from the survey was namely that air travellers feel there is not enough information regarding bio-fuel and sustainable aviation being spread, and that airlines do not communicate enough about sustainability efforts in general.

This brings us to the anticipations of KLM of the new Växjö-route as a sustainable aviation initiative. It can be concluded that the airline did not expect great support of consumers for their bio-fuel driven flight. The organisation feels that travellers do not care about bio-fuel use as price and the destination itself will be leading in their choices. Their anticipation is that the flight would have an awareness function of the climate impact of flying, but would not influence any behaviour or result in a boycott of the flight. For KLM, one of the most important factors which stands in the way of making aviation more sustainable is the mind-set of people that air travel is supposed to be cheap. Furthermore, the airline employs a modest communication strategy on their environmental efforts in general and communicating about bio-fuel use for the Växjö-route is acknowledged as a gap. Even though the airline does not hide sustainability construction behind the Växjö-flight, the feasibility study which seems to be valuable in upscaling the use of sustainable bio-fuel seems not well conversed to consumers. Thus, the meaning of such sustainable aviation initiatives, being a step in the process, might not be clear to air travellers. Additionally, the use of a sort of denying discourse on environmental issues, criticized in literature, only weakens their own efforts. These dynamics show that the airline does not actively tries to engage consumers into supporting their initiatives and making aviation more sustainable. This might be a shortcoming as support of sustainable flights would be necessary to push other airlines in doing similar efforts, which would increase the options of sustainable flying and make it easier for consumers to choose them.

In terms of change processes towards more sustainable aviation, a reference can be made to the possible transition paths identified by Verbeek & Mommaas (2009) to argue what is occurring in this research case. It can be concluded that there is a provider-led change process at play, as KLM as a provider of flights has developed a sustainable initiative without any direct public pressure to do so. In the transition

towards a greener aviation industry, it seems that KLM is the initiator of change even though they are not actively involving consumers in the transition. It can be concluded that the concepts by Verbeek & Mommaas (2009) should be used to proceed further to investigate the interplay between airlines and air travellers in a transition towards more sustainable aviation.

In final, in this research the two parties, consumer as air traveller and the aviation industry represented by airlines, both show a willingness to contribute to sustainable aviation. However, there are many factors which play a role in achieving this or not. The surveys and the interviews with KLM both present a preparedness for action but there are enough examples such as cost, offer of sustainable flights and communication which hinder a further progress towards a sustainable aviation industry. Lastly, up front we have seen that aviation was called the key weak pocket for political consumerism, however, this research shows that 42% of the surveyed air travellers are expressing a latent form of political consumerism. This concludes that there is a possibility to stimulate and facilitate such choices in the aviation sector to engage travellers in the transition towards more sustainable aviation; airlines will then have to take a lead in this by communicating credible information about their efforts, the amount of sustainable flights will have to increase and be clearly visible to travellers.

## 6.2 Recommendations future research

This research opens up an array for future research possibilities. First of all, it would be interesting to perform a likewise research which would make use of qualitative interviews or focus groups with air travellers to investigate their opinion towards sustainable aviation and bio-fuel use. In this way, it would also be possible to investigate more thoroughly the possibility of political consumerism behaviour in aviation and underlying factors. Moreover, a qualitative research which focusses on the hindering factors for air travellers to choose more sustainable flights and to investigate how to tackle these would be valuable. Moreover, it would be interesting to investigate qualitatively if the use of bio-fuel is seen by air travellers as a real solution as well, and if so, to which extent they are willing to pay a contribution to such flights if this will help to upscale the use of bio-fuel in aviation.

Furthermore, it would be interesting to approach a research on the transition towards more sustainable aviation from a critical theory perspective. This would enable a focus on power relations and could for example include other parties next to air traveller and airlines, such as governments and branch organisations as the ICAO and IATA.

## List of references

- Air Transport Action Group. (2017). *Beginner's Guide to Sustainable Aviation Fuel*. [pdf document] Retrieved February 5<sup>th</sup> from: [https://aviationbenefits.org/media/166152/beginners-guide-to-saf\\_web.pdf](https://aviationbenefits.org/media/166152/beginners-guide-to-saf_web.pdf)
- Barr, S., Shaw, G., Coles, T., & Prillwitz, J. (2010). 'A holiday is a holiday': Practicing sustainability, home and away. *Journal of Transport Geography*, 18(3), 474-481.
- Barr, S., & Prillwitz, J. (2012). Green travellers? Exploring the spatial context of sustainable mobility styles. *Applied geography*, 32(2), 798-809.
- Becken, S. (2007). Tourists' perception of international air travel's impact on the global climate and potential climate change policies. *Journal of sustainable tourism*, 15(4), 351-368.
- van Birgelen, M., Semeijn, J., & Behrens, P. (2011). Explaining pro-environment consumer behavior in air travel. *Journal of Air Transport Management*, 17(2), 125-128.
- Boeije, H. (2009). *Analysis in qualitative research*. Sage publications.
- Böhler, S., Grischkat, S., Haustein, S., & Hunecke, M. (2006). Encouraging environmentally sustainable holiday travel. *Transportation Research Part A: Policy and Practice*, 40(8), 652-670.
- Boström, M., Micheletti, M., & Oosterveer, P. J. M. (2018). Political Consumerism: Research Challenges and Future Directions. In *The Oxford Handbook of Political Consumerism*. Oxford University Press.
- Buckley, R. (2010). *Conservation tourism*. CABI.
- Budeanu, A. (2007). Sustainable tourist behaviour—a discussion of opportunities for change. *International Journal of Consumer Studies*, 31(5), 499-508.
- Burns, P. M., & Cowlshaw, C. (2014). Climate change discourses: how UK airlines communicate their case to the public. *Journal of Sustainable Tourism*, 22(5), 750-767.
- Climate Solutions. (2015). *Toward sustainable aviation fuels*. Retrieved February 5<sup>th</sup> from: [https://www.climatesolutions.org/sites/default/files/uploads/toward\\_sustainable\\_aviation\\_fuels\\_report-web.pdf](https://www.climatesolutions.org/sites/default/files/uploads/toward_sustainable_aviation_fuels_report-web.pdf)
- Cohen, D., & Crabtree, B. (2006). Qualitative research guidelines project. Retrieved from: [https://www.sswm.info/sites/default/files/reference\\_attachments/COHEN%202006%20Semistructured%20Interview.pdf](https://www.sswm.info/sites/default/files/reference_attachments/COHEN%202006%20Semistructured%20Interview.pdf)
- Davison, L., Littleford, C., & Ryley, T. (2014). Air travel attitudes and behaviours: the development of environment-based segments. *Journal of Air Transport Management*, 36, 13-22.
- Van der Donk, M. (2018). *Nieuwste vliegtuig TUI veel zuiniger en stiller*. Retrieved from: <https://www.duurzaambedrijfsleven.nl/retail/27787/nieuwste-vliegtuig-tui-veel-zuiniger-en-stiller>

Fitzgerald, B. (2019, June). Will Biofuels reduce aviation emissions? Retrieved from:  
<https://www.delta.tudelft.nl/article/will-biofuels-reduce-aviation-emissions>

Gössling, S., Broderick, J., Upham, P., Ceron, J. P., Dubois, G., Peeters, P., & Strasdas, W. (2007). Voluntary carbon offsetting schemes for aviation: Efficiency, credibility and sustainable tourism. *Journal of Sustainable tourism*, 15(3), 223-248.

Gössling, S., Scott, D., Hall, C. M., Ceron, J. P., & Dubois, G. (2012). Consumer behaviour and demand response of tourists to climate change. *Annals of Tourism Research*, 39(1), 36-58.

Gössling, S., & Peeters, P. (2007). 'It does not harm the environment!' An analysis of industry discourses on tourism, air travel and the environment. *Journal of Sustainable Tourism*, 15(4), 402- 417.

Gössling, S., & Peeters, P. (2015). Assessing tourism's global environmental impact 1900–2050. *Journal of Sustainable Tourism*, 23(5), 639-659.

Hall, C. M. (2013). Framing behavioural approaches to understanding and governing sustainable tourism consumption: Beyond neoliberalism, “nudging” and “green growth”? *Journal of Sustainable Tourism*, 21(7), 1091-1109.

Hari, T. K., Yaakob, Z., & Binitha, N. N. (2015). Aviation biofuel from renewable resources: Routes, opportunities and challenges. *Renewable and Sustainable Energy Reviews*, 42, 1234-1244.

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-based nursing*, 18(3), 66-67.

Higham, J. E., Cohen, S. A., & Cavaliere, C. T. (2014). Climate change, discretionary air travel, and the “flyers’ dilemma”. *Journal of Travel Research*, 53(4), 462-475.

IATA. (2018). IATA Alternative Fuel Factsheet [pdf document]. Retrieved from:  
<https://www.iata.org/whatwedo/environment/Pages/sustainable-alternative-jet-fuels.aspx>

de Jong, S. A. (2018). *Green horizons: On the production costs, climate impact and future supply of renewable jet fuels* (Doctoral dissertation, Utrecht University).

Jordan, A., Wurzel, R. K. W., & Zito, A. R. (2011). Consumer responsibility-taking and eco-labelling schemes in Europe. In Politics, Products, and Markets: Exploring Political Consumerism. *Micheletti et al*, 161-80.

KLM. (2018). *KLM flies sustainably to new destination Växjö*. Retrieved from:  
<https://news.klm.com/klm-flies-sustainably-to-new-destination-vaxjo/>

Lamers, M., Nawijn, J., Eijgelaar, E., Boström, M., Micheletti, M., & Oosterveer, P. (2018). Political Consumerism for Sustainable Tourism: A Review. In *The Oxford Handbook of Political Consumerism*. Oxford University Press.

Lynes, J. K., & Dredge, D. (2006). Going green: Motivations for environmental commitment in the airline industry. A case study of Scandinavian Airlines. *Journal of sustainable tourism*, 14(2), 116-138.

McDonald, S., Oates, C. J., Thyne, M., Timmis, A. J., & Carlile, C. (2015). Flying in the face of environmental concern: why green consumers continue to fly. *Journal of Marketing Management*, 31(13-14), 1503-1528.

Micheletti, M. (2003). Shopping with and for Virtues. In *Political virtue and shopping* (pp. 149-168). Palgrave Macmillan, New York.

Neilson, L. A., & Paxton, P. (2010). Social capital and political consumerism: A multilevel analysis. *Social Problems*, 57(1), 5-24.

Osseweijer, P. (n.d.). Bio-energy: not a bad idea. [interview]. Technische Universiteit Delft, Delft. Retrieved from: <https://www.tudelft.nl/en/faculty-of-applied-sciences/research/in-the-spotlight/bio-energy-not-a-bad-idea/>

Ozalp, Y., & Zwick, D. (2008). Market and public sphere: Unpacking political consumerism. *ACR North American Advances*.

Peeters, P., & Dubois, G. (2010). Tourism travel under climate change mitigation constraints. *Journal of Transport Geography*, 18(3), 447-457.

Rosenthal, E. (2010, May 24). Can we kick our addiction to flying? Retrieved January 10th, 2019, from The Guardian web site: <http://www.guardian.co.uk/environment/2010/may/24/kick-addiction-flying/>

SASgroup. (n.d.). *Newer aircraft of the right size creates less emission*. Retrieved from: <https://www.sasgroup.net/en/newer-aircraft-of-the-right-size-creates-less-emission/>

Scruggs, L., Hertel, S., Best, S. J., & Jeffords, C. (2011). Information, choice and political consumption: Human rights in the checkout lane. *Hum. Rts. Q.*, 33, 1092.

Shah, D. V., McLeod, D. M., Kim, E., Lee, S. Y., Gotlieb, M. R., Ho, S. S., & Breivik, H. (2007). Political consumerism: How communication and consumption orientations drive “lifestyle politics”. *The ANNALS of the American Academy of Political and Social Science*, 611(1), 217-235.

Spaargaren, G., & van Koppen, C. K. (2009). Provider strategies and the greening of consumption practices: exploring the role of companies in sustainable consumption. In *The new middle classes* (pp. 81-100). Springer, Dordrecht.

Stolle, D., Hooghe, M., & Micheletti, M. (2005). Politics in the supermarket: Political consumerism as a form of political participation. *International political science review*, 26(3), 245-269.

Stolle, D., & Micheletti, M. (2013). *Political consumerism: Global responsibility in action*. Cambridge University Press.

United Airlines. (2018). *Sustainable Fuel Sources*. Retrieved from:

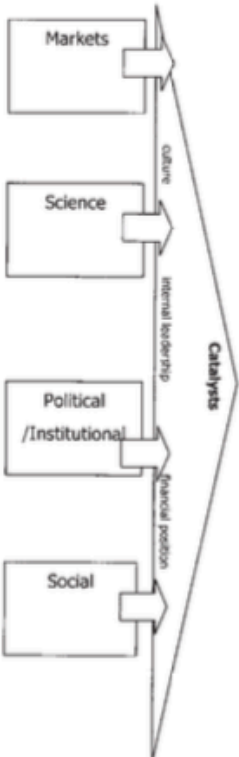
[https://www.united.com/ual/en/us/fly/company/global\\_citizenship/environment/sustainable-fuel-sources.html](https://www.united.com/ual/en/us/fly/company/global_citizenship/environment/sustainable-fuel-sources.html)

Verbeek, D., & Mommaas, H. (2008). Transitions to sustainable tourism mobility: The social practices approach. *Journal of Sustainable Tourism*, 16(6), 629-644.

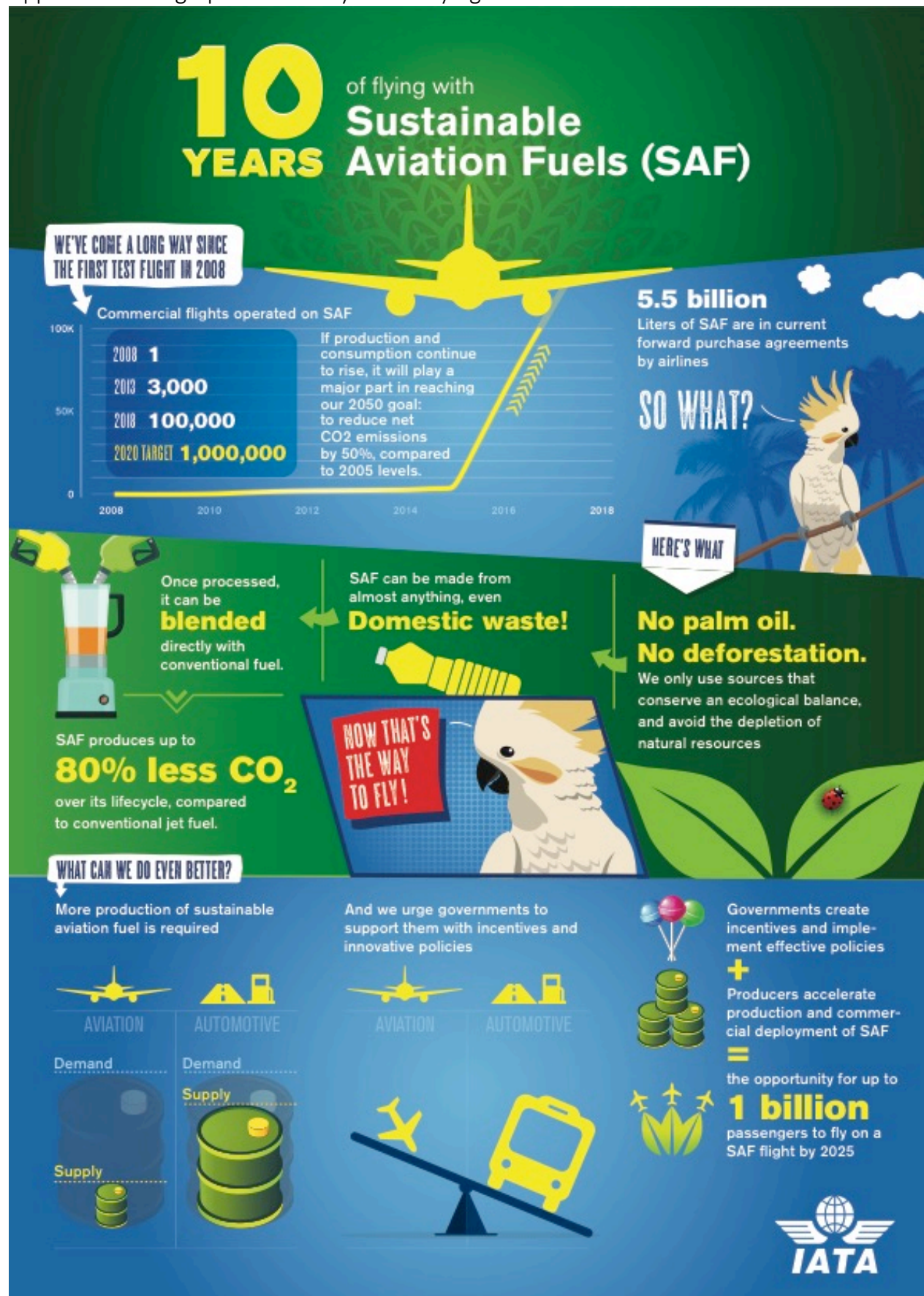
Yilmaz, N., & Atmanli, A. (2017). Sustainable alternative fuels in aviation. *Energy*, 140, 1378-1386.

## Appendices

Appendix 1: Summary of Scandinavian Airlines drivers of environmental management.

<p>Systems of influence on environmental commitment</p> 	Primary drivers	Subsets of primary drivers
	Financial cost-benefit	<ul style="list-style-type: none"> <li>Eco-efficiencies such as energy and water savings</li> <li>Boosted earnings from avoiding charges and taxes</li> </ul>
	<ul style="list-style-type: none"> <li>Immediate or medium-term</li> <li>Long-term</li> </ul>	<ul style="list-style-type: none"> <li>Competitive advantage (e.g. payback from investment in green engines)</li> <li>Better investor relations – environment can be a 'selling point' for the company</li> </ul>
	Regulatory setting	<ul style="list-style-type: none"> <li>Standards and regulations are unquestioningly accepted</li> <li>Anticipating future legislation to gain a competitive advantage</li> <li>Good image lends credibility when dealing with regulatory bodies</li> </ul>
	Being a 'good corporate citizen'	<ul style="list-style-type: none"> <li>Improving image of airline with respect to other forms of transport</li> <li>Wanting to have the image 'we care'</li> <li>Responding to the increased focus society has on the environment</li> <li>Embodying the 'Scandinavian Spirit'</li> </ul>
	Airline image	<ul style="list-style-type: none"> <li>Positive image in the marketplace</li> <li>Positive image with suppliers</li> <li>Positive image strengthens credibility with regulatory bodies</li> </ul>
	Pressures from industry stakeholders	<ul style="list-style-type: none"> <li>Corporate customers are requiring more environmental information be provided to them</li> <li>Coercive pressure from government (threat of more charges and taxes; especially EU and within Scandinavia)</li> <li>Relationships with unions instrumental in implementing environmental management changes</li> </ul>

Appendix 2. Infographic IATA 10 years of flying with Sustainable Aviation Fuels.



ATAG (2017)



## Appendix 3. Data collection instruments

### 3.1 Interview guide KLM

#### **Introduction**

Thank you for making time for this interview. The purpose of this interview is to reveal what your expectations and anticipations are of the sustainable flight-route to Växjö. I want to find this out from your point of view in order to compare it to actual passengers' opinion and support of the initiative. I will have several pre-set questions and will go over topics I want to discuss regarding expectations of the Växjö flight. The interview will approximately take half an hour. Results of the interview will be used for academic purposes only and roles can be anonymized in reporting.

Do you have any questions for me on beforehand?

#### **Topic list and Questions**

##### **Broader opening questions:**

*What is your role in the new flightroute to Växjö?*

*Can you give a short overview how the sustainable flightroute to Växjö came about?*

- *What makes it so special?*
- *Who is involved?*

##### **Reasons for initiating the project**

*Can you describe the main reasons to make the flight to Växjö more sustainable?*

Environmental strategy KLM

- Passenger needs
- Pressure Växjö municipality and citizens

*Probing; What about the timing of the project, is this specifically chosen?*

##### **Expectation passenger reactions**

*How do you think customers of KLM will respond to this more sustainable flight?*

*Probing; What do you hope the general reaction is?*

*Probing; Do you expect a boycott of the flight, so passengers deliberately choosing to go to Växjö because they can fly more sustainably? People in Sweden have a choice to go with KLM or... to longhaul destination*

- Positive opinion or not, why?
- Passengers ready for sustainable flights?

*What is being done to make people aware of the sustainability character of this flight?*

- *Targeting individual consumers of corporates?*

##### **Label Green Flight/ Communication**

*Is "green flight" seen as a sort of label?*

*Do you think it would make a difference to people if they knew the whole construction behind the green flight?*

##### **Expectations influence pro-environmental behavior**

Research shows that in tourism people are not concerned with sustainability or climate change and tourists rather not think about sustainability issues while travelling. Especially compared to other consumption domains, in which people are more easily inclined to make pro-environmental choices.

*In your opinion, do you think sustainable flight-route options will influence passengers' pro-environmental behavior? And how?*

- *Influence flight choice?*
- *Influence pro-environmental behavior in general?*

*Probing; How do you think sustainable flights and the use of bio-fuel influence passengers' awareness of the environmental impact of flying?*

- *What is done to make them more aware?*
- *Ready to pay more for their flight eventually?*
- *More people aware impact flying, take it more seriously*

### **Importance consumer response/responsibility**

*Why is passenger (consumer) response to the sustainable flight important?*

*Probing; Will KLM expand this project to other routes even if passengers don't show positive interest?*

I've read an article in which consumers mention responsibility of mitigating emissions from airplanes lies with governments and the airlines, not so much in their own behavior.

*What is your opinion, do you feel governments and the private sector need to elicit change or does responsibility lie in consumer behavior?*

- *Who is the initiator?*
- *Which actions on which levels?*

*What makes it so challenging about the aviation sector, to create effective, sustainable aviation initiatives?*

### **KLM Strategy and Sustainable flying**

*How does this launch of a sustainable bio-fuel driven flight fit in the business philosophy of KLM?*

- *Possible USP*
- *Optimistic towards bio-fuel development?*

*What is needed for KLM to upscale sustainable bio-fuel flights?*

### **Future sustainable bio-fuel flights**

*Can you tell me what you think the future of sustainable bio-fuel flights will look like?*

*Probing; What role do bio-fuels play in the future for greening aviation?*

- *Feasible*
- *What are the limitations to its success*
- *Other sustainable aviation initiatives*

Is there anything we haven't discussed that you would like to add?

Thank you for your time, your input is very much appreciated. If you are interested I am happy to send you a transcript of this interview. This is my email [emma.cuijpers@wur.nl](mailto:emma.cuijpers@wur.nl) if you would like to add anything to the interview or would like to get in touch with me about the research.

Do you want to anonymize this interview, how?

### **3.2 Interview guide Municipality + Airport Växjö**

Thank you for making time for this interview. The purpose of this interview for me is to reveal what your expectations and anticipations are of the sustainable flight-route to Växjö. I want to find this out from your point of view in order to compare it to actual passengers' opinion and support of the initiative. I will have several pre-set questions and will go over topics I want to discuss regarding expectations of the Växjö flight. The interview will approximately take half an hour. Results of the interview will be used for academic purposes only and roles can be anonymized in reporting.

Do you have any questions for me on beforehand?

### **Topic list and Questions**

#### **Broader opening questions:**

*What is your role in the new flightroute to Växjo?*

*Can you give a short overview how the sustainable flightroute to Vaxjo came about?*

- *What makes it so special?*
- *Who is involved?*
- *Timelines.*

#### **Reasons for initiating the project**

*Can you describe the main reasons why Växjo decided to cooperate with KLM for a sustainable flight?*

- *What is the goal*
- *Passenger needs*
- *Pressure citizens Växjo? Who's interest?*

*Probing; What about the timing of the project, is this specifically chosen?*

#### **Expectation passenger reactions**

*How do you think passengers/the public will respond to this more sustainable flight?*

*Probing; What do you hope the general reaction is?*

- *Positive opinion or not, why?*
- *Citizens Växjo different opinion than others?*

*Probing; What about the framing of the project? Might that influence peoples reaction?*

*Probing; Do you expect a buycott of the flight, so passengers deliberately choosing to go to Växjo because they can fly more sustainably?*

- *Passengers ready for sustainable flights?*

#### **Expectations influence pro-environmental behavior**

Research shows that in tourism people are not concerned with sustainability or climate change and tourists rather not think about sustainability issues while travelling. Especially compared to other consumption domains, in which people are more easily inclined to make pro-environmental choices.

*In your opinion, do you think sustainable flight-route options will influence passengers' pro-environmental behavior? And how?*

- *Influence flight choice?*
- *Influence pro-environmental behavior in general?*

*Probing; How do you think sustainable flights and the use of jet bio-fuel influence passengers' awareness of the environmental impact of flying?*

- *What is done to make them more aware?*
- *Ready to pay more for their flight eventually?*
- *More people aware impact flying, take it more seriously*

#### **Importance consumer response/responsibility**

*Why is passenger (consumer) response to the sustainable flight-route important?*

I've read an article in which consumers mention responsibility of mitigating emissions from airplanes lies with governments and the airlines, not so much in their own behavior.

*What is your opinion, do you feel governments and the private sector need to elicit change or does responsibility lie in consumer behavior?*

#### **Växjo and sustainable aviation**

*How does a sustainable flight-route fit in the image of Växjo?*

*If biofuel is going to be produced in Sweden, what does this mean for other flight-routes?*

- Other airlines also going to use bio-fuel to fly to/from Sweden?

**Future sustainable bio-fuel flights**

*Can you tell me what you think the future of sustainable bio-fuel flights will look like?*

*Probing; What role do bio-fuels play in the future for greening aviation?*

- Feasible
- What are the limitations to its success
- Other sustainable aviation initiatives

### 3.3 Survey



Dear traveler, by filling out this survey you help me carrying out my thesis research which I am writing for Wageningen University in collaboration with KLM Royal Dutch Airlines. I am investigating the perception of travelers on sustainable bio-fuel flights. Filling out this survey will take you a few minutes, your opinion is highly valued!

Age \_\_\_\_

Gender ☐ Female ☐ Male ☐ Other

Flying purpose ☐ Business ☐ Holidays ☐ Visiting Family/Friends ☐ Other:

**1. Did you know that KLM invests in sustainable bio-fuel for their flights?**

☐ Yes

☐ No

**2. Suppose you can choose between two airlines to get to your destination. Will the use of biofuel be a compelling factor in your choice?**

☐ Yes

☐ No

**3. Could you please indicate to which extent you agree or disagree with the following statements considering sustainable bio-fuel and aviation.**

Scale: 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree.

Statements	1	2	3	4	5
Sustainable bio-fuel driven flights are a good environmental initiative.					
Airlines do not communicate enough about sustainable aviation efforts.					
It is the responsibility of airlines to invest in biofuel and make flying more sustainable.					
I would make an effort to purchase a flight ticket from an airline that invests in sustainable aviation.					
I do not believe in the concept of sustainable aviation.					
Since airlines launch bio-fuel driven flights, I take the environmental impact of flying more seriously.					
I feel responsible to choose a more sustainable flight-route now they're offered.					
There is enough information about sustainable bio-fuel and aviation being spread.					
The environmental impact of a flight does not matter to me.					
I feel the responsibility to fly less to mitigate my own CO2 emissions from flying.					
I will not buy a flight ticket from an airline which does not invest in sustainable aviation.					
Knowing that KLM invests in sustainable aviation affects my opinion about this company in a positive way.					
As airlines invest in sustainable aviation, I intend to make more environmentally conscious travel choices as well.					
I consider myself as an environmentally conscious person					

## Appendix 4. Survey graphs and figures

### 4.1

Age Groups * Biofuel_Compelling_Factor Crosstabulation					
Age Groups			Biofuel_Compelling_Factor		Total
			No	Yes	
1,00	Count		5	29	34
	% within Age Groups		14,7%	85,3%	100,0%
	% within Biofuel_Compelling_Factor		21,7%	36,7%	33,3%
	% of Total		4,9%	28,4%	33,3%
2,00	Count		9	33	42
	% within Age Groups		21,4%	78,6%	100,0%
	% within Biofuel_Compelling_Factor		39,1%	41,8%	41,2%
	% of Total		8,8%	32,4%	41,2%
3,00	Count		1	10	11
	% within Age Groups		9,1%	90,9%	100,0%
	% within Biofuel_Compelling_Factor		4,3%	12,7%	10,8%
	% of Total		1,0%	9,8%	10,8%
4,00	Count		4	4	8
	% within Age Groups		50,0%	50,0%	100,0%
	% within Biofuel_Compelling_Factor		17,4%	5,1%	7,8%
	% of Total		3,9%	3,9%	7,8%
5,00	Count		4	3	7
	% within Age Groups		57,1%	42,9%	100,0%
	% within Biofuel_Compelling_Factor		17,4%	3,8%	6,9%
	% of Total		3,9%	2,9%	6,9%
Total	Count		23	79	102
	% within Age Groups		22,5%	77,5%	100,0%
	% within Biofuel_Compelling_Factor		100,0%	100,0%	100,0%
	% of Total		22,5%	77,5%	100,0%

Predominant_flying_purpose * Biofuel_Compelling_Factor Crosstabulation					
Predominant_flying_purpose			Biofuel_Compelling_Factor		Total
			No	Yes	
Business	Count		5	6	11
	% within Predominant_flying_purpose		45,5%	54,5%	100,0%
	% within Biofuel_Compelling_Factor		21,7%	7,6%	10,8%
	% of Total		4,9%	5,9%	10,8%
	Count		13	63	76
	% within Predominant_flying_purpose		17,1%	82,9%	100,0%
	% within Biofuel_Compelling_Factor		56,5%	79,7%	74,5%
	% of Total		12,7%	61,8%	74,5%
	Count		0	3	3
	% within Predominant_flying_purpose		0,0%	100,0%	100,0%
	% within Biofuel_Compelling_Factor		0,0%	3,8%	2,9%
	% of Total		0,0%	2,9%	2,9%
Visiting friends/family	Count		5	7	12
	% within Predominant_flying_purpose		41,7%	58,3%	100,0%
	% within Biofuel_Compelling_Factor		21,7%	8,9%	11,8%
	% of Total		4,9%	6,9%	11,8%
Total	Count		23	79	102
	% within Predominant_flying_purpose		22,5%	77,5%	100,0%
	% within Biofuel_Compelling_Factor		100,0%	100,0%	100,0%
	% of Total		22,5%	77,5%	100,0%

4.2

**Political Consumerism2**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1,00	2	2,0	2,0	2,0
	1,40	1	1,0	1,0	2,9
	1,80	1	1,0	1,0	3,9
	2,00	3	2,9	2,9	6,9
	2,20	1	1,0	1,0	7,8
	2,40	1	1,0	1,0	8,8
	2,60	8	7,8	7,8	16,7
	2,80	7	6,9	6,9	23,5
	3,00	10	9,8	9,8	33,3
	3,20	14	13,7	13,7	47,1
	3,40	11	10,8	10,8	57,8
	3,50	1	1,0	1,0	58,8
	3,60	10	9,8	9,8	68,6
	3,80	12	11,8	11,8	80,4
	4,00	10	9,8	9,8	90,2
	4,20	6	5,9	5,9	96,1
	4,40	3	2,9	2,9	99,0
	4,60	1	1,0	1,0	100,0
	Total	102	100,0	100,0	