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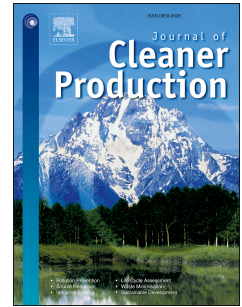
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## An Eco-label for the Airline Industry?

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### Abstract

Air travel plays a vital role in today's life because it makes remote destinations accessible and short getaways possible. Despite its benefits, air transportation contributes heavily to climate change. Behavioral change is seen as a key driver in mitigating the environmental impacts of air travel. One way to encourage behavioral change is to use eco-labels. This study explores how an eco-label could be developed for the airline industry to function as a potential driver for behavioral change. 12 interviews with airline industry experts were conducted and thematically analyzed. Empirical results were then combined with prior research and the following five criteria essential for the development of an airline eco-label were identified: credibility, comparability, clarity, transparency and participation. Out of these five criteria, participation seemed to be the most challenging to realize. Based on these criteria, this paper could be understood as a first step towards the introduction of an industry-wide eco-labelling scheme for the airline industry that could help reduce the environmental impacts of aviation through behavioral change.

**Keywords:** airline; eco-label; environmental label; behavioral change; sustainability.

## 1. Introduction

Since the transformation of air travel from a luxury product into a mode of mass transportation, long-distance travel and more frequent vacations, also referred to as hypermobility, have become a reality (Gössling and Peeters, 2007; Hares et al., 2010). However, although air travel opens up new opportunities, it also heavily contributes to climate change. It is estimated that for a vacation including air transportation, 60% to 95% of the impacts on climate change are caused by the flight itself (Gössling and Peeters, 2007; Peeters and Schouten, 2006). Aviation currently accounts for about 3.5% of worldwide CO<sub>2</sub> emissions (Penner et al., 1999). However, because its growth is projected to continue at a level of about 5% annually and the industry itself is still not facing any restrictions on its emissions growth, it is estimated that aviation's share of worldwide CO<sub>2</sub> emissions could reach a level between 15% and 40% by 2050 (Cohen and Higham, 2011; Gössling and Peeters, 2007).

Under these circumstances, there is a possible risk that regulation might restrict air transportation's future growth (Gössling et al., 2007). To avoid the possible risk of restrictions and to put aviation on a sustainable growth path, it needs to reduce its environmental impacts (Adler and Gellman, 2012). According to Hares et al. (2010), the environmental impact of air travel can be reduced through technological changes, market-based changes and behavioral changes. Gössling et al. (2007) identified behavioral changes as the key to reducing the environmental impacts of air transportation. One approach to encourage behavioral change is the use of environmental labels as described by Anderson et al. (2013), who studied the impact of a newly released eco-label on the North American motorcoach travel tour industry. Eco-labels are tools that provide the buyer with information on the environmental impacts of products (Bratt et al., 2011; Buckley, 2002), allowing them to compare different products based on their environmental performance. Eco-labels can help change consumption patterns by stimulating more sustainable purchases, and at the same time they can also motivate producers or service providers to raise their environmental standards (Gallastegui, 2002).

This study explores how an eco-label could be developed for aviation to function as a potential driver for behavioral change, which so far hasn't received much attention in the literature. Previous studies by Gössling et al. (2009), Hagemann et al. (2015) as well as Lynes and Dredge (2006) have outlined the importance of making flights environmentally comparable by using environmental indicators. Gössling et al. (2009) found evidence for air travelers' interest in

integrating environmental information into their booking decision once the information would become available. Araghi et al. (2014) confirmed these findings in their study, based on a stated choice experiment, demonstrating that an eco-label had strongly influenced the participants' airline choice. Nevertheless, none of the above mentioned studies discussed the idea in more depth by asking how an eco-label should be developed for the airline industry to potentially support behavioral change. This study explores the views of airline industry experts regarding the development of the eco-label to support behavioral change. This research question was addressed inductively based on interviews with 12 airline industry experts. The results of the study suggest that an airline eco-label should be developed based on the following five criteria: credibility, comparability, clarity, transparency, and participation.

## **2. Eco-label development and behavioral change**

### **2.1 Eco-labels**

Eco-labels are aimed at informing consumers about more sustainable consumption decisions without compromising their freedom of choice. The main function of eco-labels is to serve as a component of consumer choice (Buckley, 2002), but eco-labels are supposed to also act as a reminder to take environmental issues into account (Bratt et al., 2011; Thøgersen et al., 2010). Based on the eco-label, consumers should be able to compare different products regarding their environmental impacts. Eco-labels help close the asymmetrical information gap between consumers and producers over the question of what the environmental attributes of products are (De Boer, 2003; Rex and Baumann, 2007). The eco-label needs to define, compile, test, and summarize the environmental performance of each product and present it to the consumer in the easiest way possible (Buckley, 2002; Gallastegui, 2002).

### **2.2 Eco-labels and behavioral change**

Although eco-labels can create environmental awareness, this alone will not necessarily lead to behavioral change (Pedersen and Neergaard, 2006). In order for an eco-label to lead to behavioral change, it needs to provide information on an environmental concern that already exists among the consumer, making him or her alter the purchase decision in favor of the eco-labelled product (Teisl et al., 2002). Hahnel et al. (2015) found that under some circumstances

the presence of an eco-label might even override other product information. Behavioral change among consumers selecting more eco-labelled products can also lead to behavioral change among producers, because the eco-label provides an incentive for environmental product differentiation (Bleda and Valente, 2009; Teisl et al., 2002). Teisl and Roe (2005) emphasize that only a subset of consumers responding to an eco-label is needed in order to make producers modify their existing products or develop new ones, change their marketing strategy or target green consumers. A vast amount of studies, covering various fields and industries, revealed that eco-labels can lead to behavioral change among consumers such as in purchasing washing machines (Sammer and Wüstenhagen, 2006), eco-labelled seafood (Brécard et al., 2009), fair trade coffee (Loureiro and Lotade, 2005), eco-labelled wines (Delmas and Lessem, 2014), dolphin-safe tuna (Teisl et al., 2002) or even when buying a new car (Noblet et al., 2006). However, there also exist a fair amount of studies (e.g. Leire and Thidell, 2005; Rahbar and Wahid, 2011; van Amstel et al., 2008; Young et al., 2010) that have questioned whether eco-labels can really lead to behavioral change. Prior research has identified three possible reasons that might explain the lack of behavioral response to eco-labels: the multiplicity of eco-labels that leads to confusion (Budeanu, 2007; Font, 2002), the lack of awareness among consumers of the existence of eco-labels (Fairweather et al., 2005; Puhakka and Siikamäki, 2012), and deficits in the communication of what the eco-label stands for (Gössling and Buckley, 2016; Kozak and Nield, 2004). Thus it seems that the lack of behavioral response to eco-labels can, to a large extent, be explained by deficiencies in the design and governance of eco-labels. Design and governance need to be taken into account in the development of a new eco-label in order to overcome the lack of behavioral response.

### **2.3 Design and governance of eco-labels to support behavioral change**

Prior research has identified multiple issues as being important for the development of eco-labels. Those can be divided into design factors and governance factors (Castka and Corbett, 2016; Marx, 2013). First, the design of an eco-label should be based on the identification of need. Before introducing an eco-label into a new industry or market, it is essential to determine whether there is demand for such a label (Anderson et al., 2013; Gallastegui, 2002). Second, the eco-label should be designed so that it supports consumers in their decision making when they compare different products regarding their environmental impacts. The eco-label needs to define,

compile, test, and summarize the environmental performance of each product and present it to the consumer in the easiest way possible (Buckley, 2002; Gallastegui, 2002). Third, in order to make flights comparable the eco-label should be designed in the form of an energy label. Energy labels allow for both positive as well as negative product labelling (Grankvist et al., 2004). Prior research on energy labels has found that consumers with no or weak interest in environmental issues do not respond to any eco-label; consumers with an intermediate interest avoid products with negative (red) labels; and consumers with a strong interest in environmental issues are affected by negative and positive labels equally (Araghi et al., 2014; Grankvist et al., 2004).

Furthermore, prior research has suggested that there should be a single label for the market, because a proliferation of labels creates confusion among customers. Prado (2013), for example, described how many industries have multiple schemes and the firms have to choose among those. This choice is eventually influenced by multiple factors, such as self-regulation, adoption of technological standards, and institutional forces. If there is more than one eco-label in a specific market, this can lead to confusion and ignorance in the consumer (Bratt et al., 2011; Buckley, 2002). In addition, an internationally competitive industry – such as the airline industry – needs a globally recognized eco-label (Buckley, 2002).

Finally, the participation of multiple stakeholders has been understood as important for the design process. Balzarova and Castka (2012) mention the benefits of multiple stakeholder participation during the standard development process, which may help eliminate controversial and undesirable issues, reinforce important issues and consensus-seeking, and improve the content of the standard. This can also help to avoid the risk of consumers' experiencing information overload or suspecting greenwashing behind the environmentally friendly claim (Thøgersen et al., 2010).

Concerning the governance of eco-labels, researchers have especially stressed the importance of third-party verification (Chkanikova and Lehner, 2015). Claims made by manufacturers or service providers do not really build trust on the consumer's side and such a label might fail (Anderson et al., 2013; D'Souza et al., 2007). This lack may explain why Testa et al. (2013) found that consumers had the most trust in the so-called official eco-labels (i.e., the EU eco-label and the FCS label). In addition, Castka and Corbett (2016) found that both media and eco-label experts consider schemes with more external party involvement to be better

governed. Castka and Corbett (2016) further claim that the specifics of the design of the eco-label may be even less important than the presence of external parties in the assurance process.

In addition to these factors, the particular environmental parameter or issue to which the eco-label refers needs to be clearly stated (Buckley, 2002) as well as communicated (Thøgersen et al., 2010), and there should be no language barrier hindering the understanding (Houe and Grabot, 2009). The degree of consensus regarding the meaning and significance of terms used to communicate about the eco-label indicates that the terminology needs to be clearly defined and that the practices undertaken or outcomes of the eco-label are transparent and understandable to all parties involved (Buckley, 2002). Furthermore, Bratt et al. (2011) and Gallastegui (2002) added that the criteria for an eco-label need to be strategically developed, meaning that objectives are clearly defined and the strategies to reach these objectives are clearly laid out. Consumers must be informed of the eco-label's meaning, its characteristics, requirements, and guarantees in order to avoid unclear and confusing messages (Testa et al., 2013), such as failure to assure the buyer about the product's ecological impact, insufficient information about the producer's compliance, and the presence of recommendations (van Amstel et al., 2008). Finally, concerning the design of eco-labels, it has been suggested that in order to use, like with energy labels, positive as well as negative eco-labels, the scheme cannot be voluntarily, but needs to be enforced by a policymaker and environmental regulation (Grankvist et al., 2004; Buckley, 2002).

#### **2.4 Eco-labels in the airline industry**

Since the introduction of the first aircraft eco-labeling scheme by the British low-cost carrier Flybe (2015a) in June 2007, many discussions have arisen among various groups of airline stakeholders regarding the need for and importance of such a labeling scheme. The eco-label presented by Flybe provides simple information on the environmental performance of aircraft in the form of an energy label similar to the one known from white goods (see Figure 1). Flybe has integrated this eco-labelling scheme into its online booking system and placed the label on its aircraft as well. The methodology is openly available and allows any airline to create their own eco-label. So far not many have followed, Thomas Cook UK (2015) being one of the few.

[Figure 1 near here]



Based on the Flybe idea, the findings from the Stern Review and after hearings with representatives from the International Air Transport Association (IATA), British Airways, Virgin Atlantic, and EasyJet, the UK House of Commons Treasury Committee (2008) recommended that the airline industry join forces in developing a common eco-label scheme for the industry. The committee saw that this scheme should independently rate the environmental impacts of each flight and the information should become available for passengers at the point of purchase. While such a scheme would help passengers to make more environmentally-conscious choices, they argued, it would also encourage airlines to improve their environmental performance, which in turn could lead to more environmental competition. Although the airline representatives at the hearing agreed to commit to establishing such a scheme, no further steps have been taken by the airlines, a lack of action that may have been caused by the 2008 financial crisis and subsequent economic downturn.

Aside from these efforts, two more players who have developed an airline eco-label have emerged. The first is the Dutch-based online travel service company CheapTickets.nl, which integrated an energy label called eco value into its flight booking site in 2008 (PR Newswire, 2008). This energy label rated all flight options displayed according to their environmental impacts on a scale from A to E by taking the flight distance and amount of stopovers into account. This gave the users of CheapTickets.nl the chance to easily compare and choose different flight options by also taking environmental aspects into consideration. As the company indicated on its website, there were plans to integrate aircraft type and other factors into the calculations. However, in the meantime, eco value has been removed from the booking site and is no longer used by CheapTickets.nl (2016). The more recent development comes from Atmosfair, a German-based climate protection organization and aviation carbon offset provider. Since 2011, Atmosfair (2016) has annually released the Atmosfair Airline Index, which ranks and compares almost 200 airlines according to their environmental efficiency. The results are presented in an energy-label-like rating. Passenger load factors and the aircraft type used by the airline have the strongest impact on the calculations, but seat and cargo capacity as well as the engines installed on the aircraft are also taken into account.

Even though the importance of an airline eco-label scheme has been understood and several attempts have been made by various industry players to develop such a label, no industry-wide standard currently exists. Air travelers are not able to make environmentally

conscious decisions because they are not able to compare different flight options at the time of booking in terms of environmental impacts.

### **3. Material and Methods**

Because this study focuses on charting the views of industry experts on the novel topic of eco-label construction for aviation, an empirical approach was chosen that was qualitative (Silverman 2006) and inductive (Eriksson and Kovalainen 2008), and allowed to proceed without binding assumptions arising from any prior theory. This approach allows us to focus on the perspectives that arise from the empirical data. This qualitative and inductive nature led us to approach the topic by conducting in-depth interviews with experts that have been actively involved in the sustainable development of the airline industry. The data collection took place in two steps. The first step included informal interviews among participants at a professional conference and the second step consisted of standardized interviews with 12 airline industry experts. This approach was chosen in order to first gather an understanding of a topic which has not, to date, received much attention in the literature. The second reason was to build contacts with the industry in order to find suitable experts for in-depth interviews.

The potential idea for an industry-wide eco-label within the airline industry was first discussed among the participants at the Air Transport World 5th Annual Eco-Aviation Conference in Washington, D.C. in June 2012. The participants, all CSR professionals, represented major airlines from the United States, Europe and Asia, all major airframe makers and engine producers, international airports, airline trade associations as well as aviation industry service providers. The discussions took place during breaks and when there was time for socializing. The discussions, with three to five participants each, were informal and unstructured and took place in a focus-group setting. The participants looked at samples of Flybe's and CheapTickets.nl's eco-labels and commented on the idea and whether they thought something similar could be introduced industry-wide. Even though the conference participants were very positive about the idea of using eco-labels in the airline industry, the question remained of how it should be developed, something that could not have been discussed during these short discussion rounds.

The interviewees were selected according to recommendations and contacts given by the conference participants. At the beginning of the interview all interviewees were presented with the eco-labelling scheme presented by Flybe and the eco value scheme used by CheapTickets.nl.

After that, major themes identified during the conference were discussed. Standardized open-ended interviews with 12 airline industry experts (see Table 1) were conducted between June 2012 and April 2013. The work of all 12 experts was directly related to environmental issues and all of them hold positions responsible for sustainable development or CSR within the organization they belonged to. The interviewees represented major international and regional airlines, air traffic and airport authorities, global transaction processors, IT solutions providers, airline management consultant companies, international business travel agencies, aviation fuel suppliers as well as facility maintenance and waste treatment service providers.

[Table 1 near here]

Most of the interviews were conducted face-to-face at the experts' workplaces in three European countries: Germany, Finland and Spain. Two interviews were conducted over the phone. The length of each interview varied between 40 and 120 minutes. Although all 12 experts were based in Europe, the focus of the interviews was kept on a global scale, meaning only experts who worked for large international corporations were chosen. All of the experts were capable of answering the questions from a global perspective. All 12 interviews were transcribed and thematically analyzed based on the three themes that emerged from the discussions at the conference and provided then the bases for reporting the results.

The interview data were first analyzed inductively and thematically (Bryman and Bell, 2007; Tuomi and Sarajärvi, 2009) and the empirical results were then connected with prior research in order to respond to the research question. This means that the data was first analyzed based on its contents, without binding rules coming from theory. The analysis was conducted in four phases:

1. The first author read through the data multiple times and coded the key aspects that arose from the industry experts' views on the idea of developing the eco-label to potentially support behavioral change.

2. Based on those codes, he then wrote summaries of each interview and the key aspects identified in them concerning the development of eco-labels. During this phase, different aspects related to the question of developing the eco-label to potentially support behavioral change were grouped in each summary.

3. Summaries were compared to each other, based on their similarities and differences. In this phase, both researchers participated in the process. Similarities and differences between the interviews were identified. Based on the similarities, original themes were then formed. The themes were named based on their content. Seven themes were identified: identification of the need for an eco-label, simple message at the right time, using an energy label, flight specific, only one eco-label, creating an industry standard, and key actors.

4. After working inductively with the empirical data, prior research results were integrated. The aforementioned themes were, therefore, categorized as those that deal with the design of eco-labels and those that deal with the governance of eco-labels. Finally, the results of the empirical data and prior research were integrated to identify the criteria that different themes would support in the development process. Thus criteria for the development of an airline eco-label (Table 2) were created. Based on the prior literature and the empirical results, five criteria for eco-label development were identified: credibility, comparability, clarity, transparency, and participation.

## **4. Results**

### **4.1 Development of an eco-label based on expert views**

This section presents the empirical results of the thematically analyzed interviews with 12 airline industry experts. The results have been divided into two different themes, focusing on the design and the governance of an airline eco-label separately.

#### **4.1.1 Design of airline eco-label**

##### **Identification of the need for an airline eco-label**

All of the interviewed industry experts agreed that there is a difference between the environmental performance of airlines, and choosing a flight according to environmental aspects can make a real difference.

“When I have given some examples based on our emissions reports most of the people just [couldn’t] believe that there can be so big differences even these days and even with so-called modern airlines. [...] I have noticed it can be almost doubled, those emissions, on some routes.” Communication manager, international business travel agency (December 4, 2012)

The industry experts saw possibilities in making flights environmentally comparable through an eco-label. They believed that it could lead to more competition between airlines. The industry experts do not currently see that much competition exists between airlines on environmental issues. It is more the case that airlines are cooperating in this field through, for example, collective lobbying or by sharing best practices. Most airlines just follow the minimum environmental legislation, and only a few go beyond compliance. However, these differences are hardly noticed by the average air traveler. It is therefore still difficult for airlines that go beyond compliance to differentiate themselves from their competitors. Nevertheless, if the environmental performance of each and every airline were to become visible to the air traveler, the situation might change. This change would reward airlines which have been going beyond compliance.

“...in five years’ time I think it is more common [...] that you look not only [at the] price [...] and the total flying time [...] you also [will] have the third parameter which is how eco is it to travel. [...] one day [it] will be as common as you go to the store and you look for those apples and you take the best apples there although it is a bit more expensive.” Managing director, global transaction processor (February 27, 2013)

At the same time, a label would also push those airlines that have only followed the minimum legislation to become more active because they might otherwise be driven out of business.

### **Simple message at the right time**

The industry experts felt that these environmental aspects continue to be difficult to communicate for airlines. Several airlines had, in fact, been harshly criticized for their environmental communication. It was also found that the general public has a negative environmental image of airlines and that environmental communication might easily be perceived as greenwashing. Therefore industry experts saw a clear need to communicate the environmental responsibility of airlines with concrete figures, meaning the message should be

simple and easy to understand for everyone. It was seen as important that the message is integrated into the booking process so that the right information is available at the right time when the booking decision is made.

“Now the indicators [...] are price, route, how many times you need to change and what time you are [at the] destination [...] but if there would be one more issue [like a] green factor [...] then it would start to become [part] of our decision making.” Senior manager, aviation fuels/biofuels (July 4, 2012)

“It might be that you favor only the fastest flight [...] it might be that you favor the cheapest flight, but it can also be that you want to compare [...] how strongly it is polluting [...]. So again therefore I think it is so relevant that there is this standard.” Managing director, global transaction processor (February 27, 2013)

### **Using energy label**

Most interviewees recognized that the information provided by using an energy label would be sufficient. The information an energy label provides was seen as easy to understand, visible and available while choosing between different flight options. Some participants, however, demanded more detailed information for those users who want to learn more about the methodology in order to ensure transparency and trustworthiness. Nevertheless, several participants warned that if the information provided is too complex, it might result in disinterest. The following extracts exemplify how the interviewees expressed their support for the energy label.

“I see, this is a splendid idea, very interesting if you go to a shop and try to buy a refrigerator [...] you have the [same kind of] labelling for energy efficiency.” Environmental manager, air traffic and airport authority (June 29, 2012)

“...it already feels familiar because we have [...] used these kinds [...] of symbols in those household machines and it is very illustrative and [...] easy to understand.” Communication manager, international business travel agency (December 4, 2012)

### **Flight specific**

The industry experts emphasized an airline eco-label should not be granted to a particular airline and should, instead, be flight specific. Which airline is the best choice depends on many factors

and might vary from route to route. The air traveler should be provided with easy-to-read information on which airline and flight is the best on the particular route and day she wants to travel.

“I think it is good [...] this format of having those green A’s and red E’s [...] it is easy to understand and easy to see which options are good [and] which options are not so good...” Communication manager, international business travel agency (December 4, 2012)

“I think this would be the easiest way for passengers to quickly check.” Vice-president, sustainable development, major network carrier (January 30, 2013)

In terms of flight specific environmental aspects that should be considered, the industry experts had many suggestions. However, all acknowledged that at least the aircraft type and its configuration (engines, seat layout, cargo capacity, winglets/sharklets), the average load factor and the route (amount of stopovers, capacity of airports, local noise issues) should be considered. There was also strong agreement to calculate not only CO<sub>2</sub> emissions but to take all greenhouse gases into account.

### **Only one eco-label**

The industry experts underlined that an industry standard is inevitable. If every airline were to create their own measurements, the whole discussion would lose credibility and air travelers would not be able to compare “apples with apples.”

“...if we don’t have [a] common approach, we lose a lot of credibility and it takes ages to regain that credibility.” Group environmental office, global transaction processor (April 24, 2013)

As much as the participants appreciated the idea of an industry-wide environmental label, the major concern they shared was if and how there will ever be an agreement on the methodology. The experts definitely concurred that there should be only one eco-label that covers all flights, but such a label would also require an agreement by all of the parties involved.

“So, I indeed don’t see this [environmental] rating possible as an initiative that could be agreed inside the industry. It would need to come [from] outside the industry and need to be [...] built up without full [industry] consensus.” Environmental manager, air traffic and airport authority (June 29, 2012)

Several participants mentioned the problems with the emissions calculator IATA tried to develop. Because airlines were not able to agree on one common methodology, in the end every airline developed their own calculator. The only independent emissions calculator currently existing was developed by the International Civil Aviation Organization (ICAO).

#### **4.1.2 Governance of airline eco-label**

##### **Creating an industry standard**

Creating an industry standard in the form of an easy-to-understand environmental indicator (e.g. an eco-label) was seen by many interviewees as invaluable. Such an indicator would make flights environmentally comparable and, if they so desire, give air travelers the possibility to actively choose the environmentally more preferable flights.

“I think it will be a matter of combining efforts [...] to raise awareness and also eventually to promote rather than penalize environmentally friendly [flight] options. [...] It will be, of course, something very valuable for individuals [...] to have this information. Whether they use it [in] one way or the other, I don't know, but at least it would be good to have that information.” Group environmental office, global transaction processor (April 24, 2013)

According to the interviewees, environmental indicators are already used in corporate purchasing and reporting and many travel agents have been providing their corporate customers with carbon footprints or CO<sub>2</sub> figures of their flights for years. To date, however, no industry standard exists and travel agents use various methodologies to calculate emissions. Even though the environmental indicators have mainly been used for reporting purposes, corporate customers have begun asking for environmental information about flights already at the booking stage.

“...more and more [of our corporate] customers would like to know the emissions of their flights beforehand...” Communication manager, international business travel agency (December 4, 2012)

The interviewees therefore appreciated the idea of an eco-label as industry wide standard. Under such circumstances, an airline not participating in the labelling scheme would lose its “license to



operate,” because not using the industry-wide label would look suspicious to air travelers. The standard should also be on an international level to ensure that all flights are comparable

### **Key actors**

As for the introduction of an airline eco-label, the industry experts named two potential actors that could facilitate the introduction. Because it might be difficult to find common agreement between airlines and because it might not look trustworthy when airlines release their own eco-label, several participants discussed the idea of using travel agents to introduce an industry-wide eco-label. As mentioned earlier, many travel agents have developed and are using their own environmental indicators. The figures used there could easily be translated into symbols rating flights on a scale from A to E.

“But of course I don’t see why can’t there be one row saying emissions in numbers there. [...] considering consumers, it is a very good idea to use these symbols because they are so much easier to understand.” Communication manager, international business travel agency (December 4, 2012)

Another advantage is also that travel agents have easy access to the information needed to evaluate flights individually, such as aircraft type, cabin layout or load factors. Although travel agents currently use various methodologies to calculate environmental impacts, the industry experts did not see a major problem in finding common agreement among them. However, industry experts recognized that the best solution for an industry-wide eco-label would be to go through an independent authority. Different possible authorities were discussed, but all participants ultimately agreed that ICAO represents the most suitable option.

“...out of the many possibilities I believe ICAO is the best option.” Group environmental office, global transaction processor (personal communication, April 24, 2013)

“...basically ICAO is the only organization who can [bring this up] internationally...” CEO, regional airline (November 23, 2012)

The advantage of this approach is that problems with finding agreement or trustworthiness could be overcome. The experts shared the opinion that this approach is the only one that could lead to an industry standard all players would comply with. Finally, Figure 2 provides an overview of the content and themes the interviewees identified as critical for the development of an eco-label scheme for the airline industry.

[Figure 2 near here]

#### **4.2. Criteria for airline eco-label development**

Based on theory and our empirical results, five criteria for the development of an airline eco-label have been identified, as displayed in Figure 3.

[Figure 3 near here]

These five criteria are: credibility, comparability, clarity, transparency, and participation. Credibility in terms of eco-labeling refers to trust or positive reputation built through quality assurance (Nilsson et al., 2004). Based on theory and empirical results presented in this study the credibility of an airline eco-label can be established through global recognition, third-party verification, enforcement by policymakers, a commonly agreed methodology, and the inclusion of all greenhouse gas emissions. The second criterion, comparability, refers, in terms of eco-labeling, to making the environmental performance of products comparable. Based on the findings of our literature review and the results of our industry expert interviews, the comparability of an airline eco-label can be ensured through the use of energy labels, by making the label flight-specific and designing it in a way that makes information available easily and at the right time, supporting the air traveler in his decision making. The third criterion is clarity, which refers in terms of eco-labels to a clear understanding of what the eco-label stands for (Delmas et al., 2013). The relevant theories as well as our results show that the clarity of an airline eco-label depends on the clear definition and strategic development of objectives as well as on the existence of a single airline eco-label on the market. The fourth criterion, transparency, refers to the open communication and detailed description of the eco-label's criteria to the consumer (Font and Buckley, 2001). The transparency of an airline eco-label thus depends on the communication of objectives as well as on identifying the need for an eco-label. Finally, the fifth criterion, participation, refers to the stakeholders that are involved in the development process of an eco-label. For an airline eco-label, it was seen as essential to have multiple stakeholders, common industry agreement, and a key actor to drive the idea forward. Table 2 provides an overview of all five criteria based on findings from theory and empirical results.

[Table 2 near here]

## 5. Discussion and conclusion

This study set out to explore how an eco-label could be developed for the airline industry to function as a potential driver for behavioral change. To gain a deeper understanding, 12 interviews with airline industry experts were conducted and the results were thematically analyzed. The identified themes were divided into design factors (identification of need, simple message at the right time, using energy label, flight specific, and only one eco-label) and governance factors (creating an industry standard and key actors). The study further identified five criteria that are essential for the development of an airline eco-label to support behavioral change. These criteria were developed based on the theoretical foundations and empirical findings of the study: credibility, comparability, clarity, transparency and participation.

The findings revealed a clear need for an eco-label in the airline industry due to the fact that air travelers are currently unable to compare flights environmentally. Determining such a need has been identified as crucial for the introduction of an eco-label into a new industry or market (Anderson et al., 2013; Gallastegui, 2002). In terms of the five criteria essential for the development of an airline eco-label, the results suggested that the first four criteria (credibility, comparability, clarity, and transparency) seemed possible to implement, despite a few minor unresolved issues, such as how to find industry agreement on the eco-label methodology or which greenhouse gas emissions should be included. However, in regards to participation, namely about who should develop the eco-label and which stakeholders should be involved, many questions remained open. Nevertheless, this study was able to identify the participation of certain stakeholders as a necessity for the development of an eco-label and not just beneficial for the process, as claimed by Balzarova and Castka (2012). Although the industry experts provided some ideas on who the key actors could be, no clear consensus emerged. Finding the right actor to drive such a labeling scheme forward has already proven difficult in the past. For example, in 2008 the UK House of Commons Treasury Committee recommended the development of a common eco-label scheme for the industry, but this has not led to any further action. This paper lacks the ability to answer the question of who should participate in the development of such an eco-labeling scheme, but there is certainly room for further research.

In addition, the empirical findings supported prior research concerning the focus on energy labelling (Araghi et al., 2014; Grankvist et al., 2004) and the need for a single eco-label in an industry to create comparability (Bratt et al., 2011; Buckley, 2002). The findings also supported Araghi et al.'s (2014) view that energy labelling has the possibility to reach not only green consumers but also the remaining ones. On the basis of the current study, it can be concluded that while traditional eco-labels designate only the environmentally most preferable choices, an energy label provides more room to choose not only the greenest flight but also some option in between. At the same time, it clearly provides the chance to avoid the environmentally least preferable option. In line with Teisl et al. (2002), who have argued that eco-label development should be based on existing environmental concerns, using an energy label would provide an opportunity to answer the concerns of the green consumer as well as those of the remaining consumers. However, whether an energy label would really lead to behavioral change in air travelers' booking decisions and make them avoid red-labelled flights could not be answered with this study. To address this issue, the use of an experimental study design seems more appropriate, which could be subject for further research.

Finally, if the airline eco-label were to be an energy label, then enforcement by a policymaker would be inevitable, as discussed earlier by Grankvist et al. (2004). Otherwise, without enforcement, some airlines would probably refuse to participate in the scheme and the opportunity to make flights equally comparable could not be realized. Who the enforcing policymaker could be again refers to the criterion of participation, which has not been solved in this paper and therefore provides an additional source for further research.

This study is the first to discuss the idea of an airline eco-label in more depth through industry expert interviews. The findings increase understanding of the role that design and governance factors play in the development of an airline eco-label. Furthermore, the findings open up new avenues for scientific discussions, as many new factors relevant to the development of an airline eco-label arose. The major contribution, however, lays in the identification of five criteria essential for the development of an airline eco-label. Nevertheless, even though this study focused exclusively on the airline industry, these five criteria could certainly be applied in the development of eco-labels in other sectors. As its practical contribution, this study identified a clear need for an airline eco-label, and could therefore be understood as a first step towards the introduction of an industry-wide eco-labelling scheme.

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Table 1. Industry experts who participated in the interviews.

<b>Position</b>	<b>Industry sector</b>
Senior sales manager	Aviation fuels
Environmental manager	Air traffic and airport authority
Senior manager	Maintenance and waste treatment
Senior manager	Aviation fuels / biofuels
Client director	Airline management consultancy
Environmental manager	Major network carrier
VP environmental issues	Major network carrier
CEO	Regional airline
Communication manager	International business travel agency
VP sustainable development	Major network carrier
Managing director	Global transaction processor
Group environmental officer	Global transaction processor

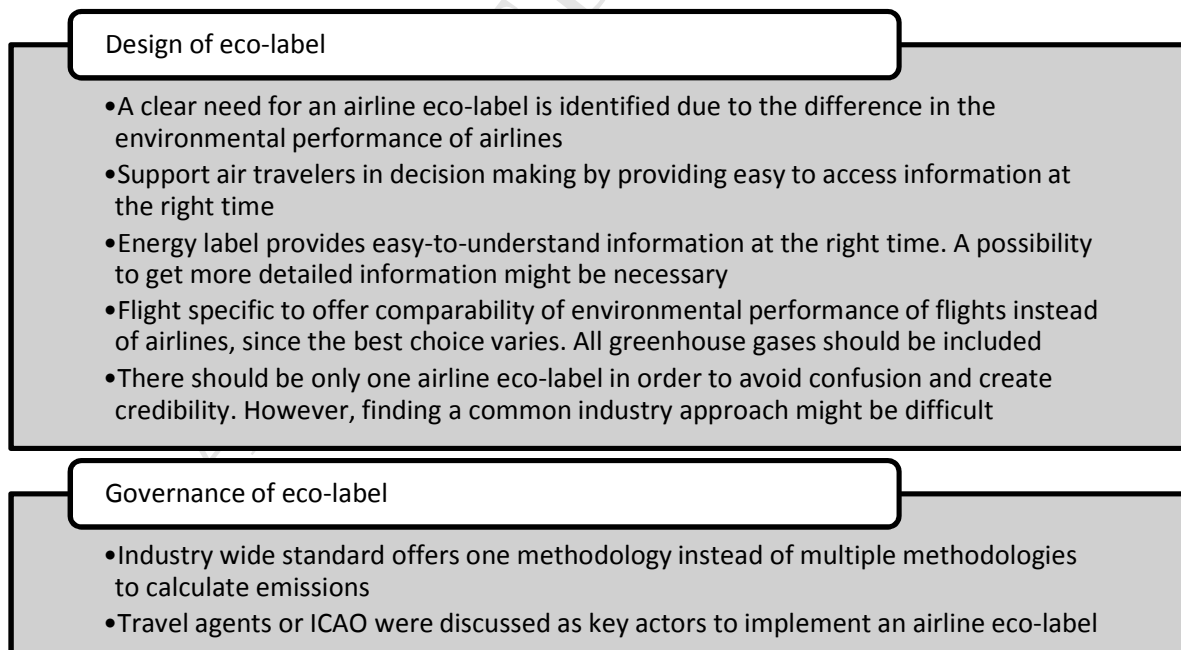


Figure 2. Critical factors for the development of an airline eco-label.

Table 2. Five criteria based on theory and empirical results.

		<b>Credibility</b>	<b>Comparability</b>	<b>Clarity</b>	<b>Transparency</b>	<b>Participation</b>
<b>Theory</b>	<b>Design</b>	Eco-label should be globally recognized	Eco-label should support consumer in decision making  Eco-label should be energy label	Multiple eco-label schemes should be avoided	Identification of need for eco-label	Multiple stakeholder participation should be encouraged
	<b>Governance</b>	Eco-label should be third party verified  Eco-label should be enforced through policymaker		Eco-label objectives should be clearly defined  Eco-label objectives should be strategically developed	Eco-label objectives should be transparently communicated	
<b>Empirical results</b>	<b>Design</b>	All greenhouse gases should be included	Eco-label supports air traveler through easily accessible information at the right time  Eco-label should be flight specific and not granted to individual airlines	Energy label provides easy-to-understand information  There should be only one airline eco-label in order to avoid confusion and ignorance	Clear need for airline eco-label identified	Finding a common industry approach might be difficult
	<b>Governance</b>	Industry standard should be created utilizing one common methodology				Travel agents or ICAO could become key actors in implementation

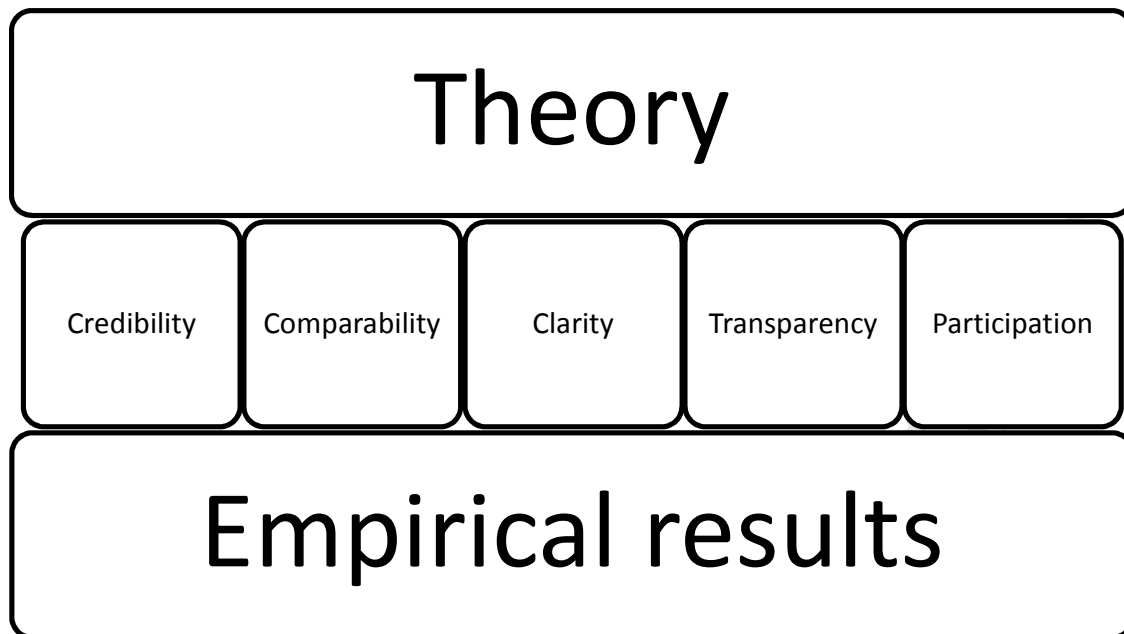


Figure 3. Criteria for the development of an airline eco-label.

Flybe Bombardier Q400		flybe.
<b>Local Environment</b>		
Noise Rating		
		<b>A</b>
Take off & Landing CO <sub>2</sub> Emissions		<b>A (817 kg)</b>
Take off & Landing CO <sub>2</sub> Emissions (per seat)		<b>10.5kg</b>
Take off & Landing Local Air Quality <sup>†</sup>		<b>2kg</b>
<b>Journey Environment</b>		
Total Aircraft Fuel Consumption By Journey Length	Domestic (500km)	<b>A (1044kg)</b>
	Near EU (1000km)	<b>A (1896kg)</b>
	Short Haul (1500km)	<b>A (2760kg)</b>
CO <sub>2</sub> Emissions Per Seat By Journey Length	Domestic (500km)	<b>B (42kg)</b>
	Near EU (1000km)	<b>B (77kg)</b>
	Short Haul (1500km)	<b>B (111kg)</b>
<b>Passenger Environment</b>		
	Minimum Leg Room	<b>30"</b>
	Number Of Seats	<b>78</b>
<sup>†</sup> Emissions of Nitrogen Oxides as an indicator of the effects on local air quality		

Flybe Bombardier Q300		flybe.
<b>Local Environment</b>		
Noise Rating		
		<b>A</b>
Take off & Landing CO <sub>2</sub> Emissions		<b>A (763 kg)</b>
Take off & Landing CO <sub>2</sub> Emissions (per seat)		<b>15.3kg</b>
Take off & Landing Local Air Quality <sup>†</sup>		<b>2kg</b>
<b>Journey Environment</b>		
Total Aircraft Fuel Consumption By Journey Length	Domestic (500km)	<b>A (678kg)</b>
	Near EU (1000km)	<b>A (1249kg)</b>
	Short Haul (1500km)	n/e
CO <sub>2</sub> Emissions Per Seat By Journey Length	Domestic (500km)	<b>B (43kg)</b>
	Near EU (1000km)	<b>B (79kg)</b>
	Short Haul (1500km)	n/e
<b>Passenger Environment</b>		
	Minimum Leg Room	<b>30"</b>
	Number Of Seats	<b>50</b>
<sup>†</sup> Emissions of Nitrogen Oxides as an indicator of the effects on local air quality		

**Highlights**

- This article explores the idea of introducing an eco-label for the airline industry
- Twelve interviews with aviation industry experts have been conducted
- A clear need for an airline eco-label could be detected
- Five criteria essential for the development of an airline eco-label are presented