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MANAGEMENT ATTITUDES TOWARDS THE CARBON FOOTPRINT  
OF BUSINESS TRAVELING

Corporate Environmental Management

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<p>Abstract</p> <p>The climate change has been under a great interest within the societal discussions, corporate agendas and in the media lately. Especially the relation of the biggest organizations' to the climate change has been discussed in public and there has been an increased interest of different stakeholders towards the issue.</p> <p>Business traveling in the organizations has increased within the last years and this has brought new environmental aspects and impacts which the people responsible of environmental issues and travel management need to take into consideration.</p> <p>The purpose of the study is to analyze attitudes that the top 150 biggest Finnish organizations' environmental and travel management have towards the carbon footprint of business traveling. The research is quantitative and has been executed in the form of a survey with electric questionnaire.</p> <p>Theoretical framework of the research consists of theories dealing with attitudes, business traveling and the carbon footprint. The perspective of corporate environmental management related to the aforementioned issues has also been included.</p> <p>The results indicate there is an increase in business traveling and a vast majority of the managers would like to decrease the carbon footprint of business traveling. In addition, the management is interested in finding alternative means in order to decrease the carbon footprint.</p>	
<p>Keywords: Carbon footprint, business traveling, management attitudes, top Finnish companies, Corporate Environmental Management</p>	

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## **APPENDICES**

# 1. INTRODUCTION

Recently, the topic of climate change has received a great interest among the societal discussions, decision makers, corporate agendas and the media in Finland (Ilmastonmuutos 2007). According to a research, in Finland the climate change is currently considered as the most important issue, among the 15-79 year old citizens, which has an impact on people's lives (Ministry of Trade and Industry 2007). Especially the relation of the biggest organizations' to the climate change has been discussed in public and there has been an increased interest of different stakeholders towards the issue. Due to the companies' increased consumption of energy and emissions, also the impacts to the environment have been accelerated. Therefore, organizations are expected to execute concrete actions to decline climate change. Due to anthropogenic actions proceeding climate change, taking environmental issues such as carbon footprint into consideration, plays an important role also when planning their business traveling.

When organizations need to consider the environmental aspects and impacts deriving from different processes e.g. business traveling, corporate environmental management is field of business that is taken into account. This cannot be done without integrating environmentally sound objectives into the strategic decision making within the organizations. When properly executed, the environmental managers establish an effective communication throughout the organization, their suppliers and different stakeholders in order to decrease the environmental emissions e.g. carbon footprint.

Theoretical framework of the research consists of theories dealing with attitudes, business traveling and carbon footprint. Attitudes are dealt with from the perspective of basic theories of attitudes and also from the organizational, environmental and managerial perspective. Also attitudes affection to behaviour is being considered. The role of business traveling is being discussed from the environmental management's point of view and the travel management and corporate travel policy are being considered and explained due to the fact that the topic is relatively new and examined in very small scale. The carbon footprint is discussed generally and also

from the perspective of business traveling. Decreasing the carbon footprint and carbon offsetting are also discussed.

The purpose of the research is to study the attitudes of managers towards carbon footprint caused by organizations' business traveling. The target group of the research is the managers responsible for environmental management and travel management of the top 150 Finnish companies (talouselämä). The research is quantitative and the data was collected by using structured electronic questionnaire between December 2007 and January 2008.

The results indicate that the management in Finnish top 150 organizations is interested in measuring the carbon footprint caused by business traveling and half of the companies can at least partially measure it already. Vast majority of the management is interested in decreasing carbon footprint caused by business traveling. It can also be seen, that the management has not yet formed an opinion about carbon offsetting. Majority of the management is also interested in reducing costs and decreasing carbon footprint by decreasing organizations' business traveling.

Conclusion chapter presents a Model of Environmentally Responsible Corporate Travel Policy which focuses on decreasing the carbon footprint originating from business traveling. The MERCTP is divided on seven separate phases and is based on continuous improvement.

## **2. THE ATTITUDES AND CORPORATE ENVIRONMENTAL MANAGEMENT**

### ***2.1 The role of attitudes in corporate environmental management***

Due to the increase in anthropogenic greenhouse gases, pollution to the soil and waters, and the loss of endangered species caused by human activities, the role of business and corporate strategies has changed within the recent decades. Different stakeholders including governments, consumers, NGO's have started to require more responsible action from the companies, this including a new way of managing environmental aspects. This has led to a formation of corporate environmental management, which main principle is to integrate environmental performance in every level and functions in business. In addition, this means the organizations need to green their businesses and in order to achieve this, it requires change in management and employee attitudes. The dominant ideology among senior level management in the industry has transformed into less inexorable way of seeing the planet we live in (Gouldson & Welford 1993, preface).

One way of studying attitudes is to reflect them in terms of stakeholders. Basically this means that an organization or the management operates in a certain way due to the fact because it is expected and even demanded so by different stakeholder. Thus nowadays business world it is not enough to think about only the organizations' priorities, but instead the organization is required to conduct decisions that satisfy the expectations and needs of different other parties. Kujala (2001) analysed in her synthesis that the most important stakeholders considered to be are customers, employees, shareholders, community, government and suppliers (Kujala 2001, 42). Traditionally the stakeholder interest has been towards the economic performance of the organization, but within the last decades the stakeholder pressure has increasingly started to focus on the organization's environmental performance (See figure 1) (Gouldson & Welford 1993, 8).

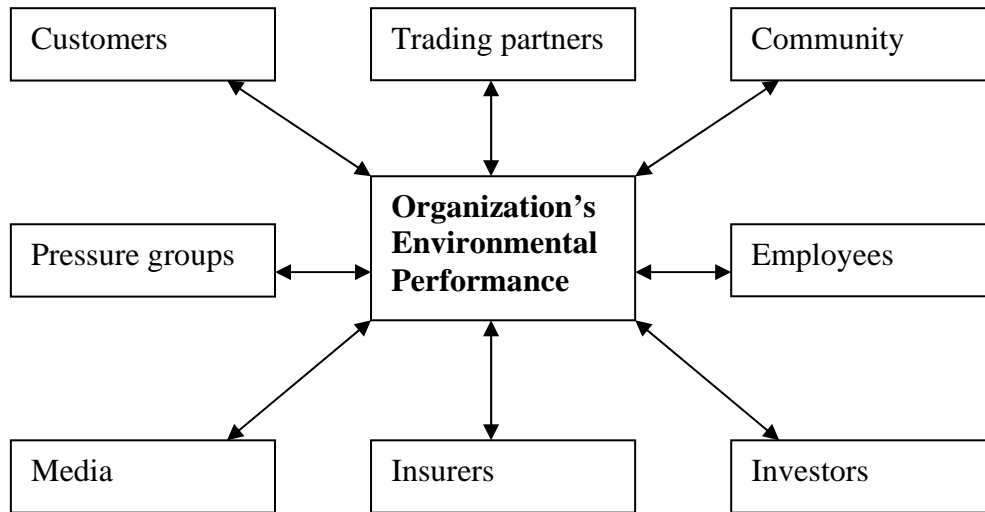


FIGURE 1. Stakeholder pressure and environmental performance (Gouldson & Welford 1993, 8)

Industry plays an important role in protecting and improving the environment since often it is identified as a major source of polluter. By implementing environmental management tools organizations may develop strategies in order to face global environmental problems. In this process, there is a need to change attitudes towards both consumption and production. (Gouldson & Welford 1993, preface-1.) Andrews (1998, 531) illuminates that an organization who is taking environmental issues into consideration can be called a “pro-active” organization, and voluntarily internalises society’s environmental goals. The sort of organization cooperates with governments and incorporates environmental aspects at the strategic level of decision making, instead of only an instrumental one. (Andrews 1998, 531.) Those companies who respond to the environmental challenge will position themselves at the forefront of the industry, thus gaining a competitive advantage over their competitors (Gouldson & Welford 1993, 2). The role of management is especially important in the process of integrating environmental issues into management decision making (Subhabrata 2001, 49). Management attitudes shall be discussed more in chapter 2. 9.



## **2.2 Attitudes in general**

The concept of an attitude comes from the field of social psychology. Social psychology is sometimes defined as the scientific study of attitudes by many early theorists (Ajzen & Fishbein 2002, 13). Attitude can be defined as a positive or negative way of dealing with a certain socially relevant object (Helkama, Myllyniemi & Liebkind 1998, 379.) or as a psychological tendency that occurs when certain object is judged either negatively or positively. (Hewstone, Stroebe & Stephenson 1996, 607.) Attitudes are our own opinions about people and matters and they tell us how to relate to certain aspects. According to William James, attitudes give the meaning to the world and help us to analyze the surrounding world. Attitudes are learned, mild or strong models of how to think, feel, or act in a certain way and they express our positive or negative assessment. Most clearly attitudes come out in moral and ethical questions, and are rather permanent and change slowly. (Vilkko-Riihelä 2001, 690.)

Attitudes always relate information and feelings about the object. These components are cognitive, affective and behavioral. Attitudes' *informational* (cognitive) component includes the opinions and the information about the object. *Emotional* (affective) component expresses the emotional attitude to the object. These components, information and the feelings, usually lead to *behavior*. Usually the change in one attitude component leads to change in other component too. (Sorrentino & Higgins 1996, 204; Vilkko-Riihelä 2001, 693.)

## **2.3 Attitudes' relation to behavior**

As mentioned before, attitudes involve a behavioral component which means intentions to act in certain ways relative to the items or persons involved (Baron 1989, 479). However, research indicates that attitudes alone are rather poor predictors of behavior (Pawlik & Rosenzweig 2000, 315). The relationship between attitudes and behavior has attracted a lot of research attention. Probably the most well known case is Richard Lapiere's research. In 1934 he visited 250 hotels in United States of America with Chinese couple and only one hotel forbade their entrance. During 1930's Chinese were considered as unwanted guests in hotels and restaurants. Half a year later, Lapiere sent these hotels a questionnaire and asked if

the hotels are willing to accommodate Chinese visitors. Approximately half of the hotels returned the questionnaire and 92 per cent gave a negative answer. The result showed that the correspondence between attitude and behavior is rather weak. (Helkama et al. 1999, 196-197; Vilkkö-Riihelä 2001, 694; Pawlik et al. 2000, 315.) However, the researchers have proved that the correspondence exists. Attitudes are better predictors of behavior if the focus is on attitudes which are very specific to certain behavior (Pawlik et al., 2000, 315). Several theories and models have been created about the relationship between attitude and behavior.

### 2.3.1 Theory of Reasoned Action

Probably the most well known model of the relationship between attitudes and behavior is Icek Ajzen's and Martin Fishbein's model called the Theory of Reasoned Action discovered in 1967 (Figure 2). In this model, the behavior is determined by intentions, which in turn are shaped by attitudes to behavior and subjective norms (Ajzen et al. 1980, 5-8; Zint 2002, 824). Empirical studies support this theory but the limitation of the theory is that it applies only to those behaviors which are predominantly volitional in nature (Eysenck 1990, 32).

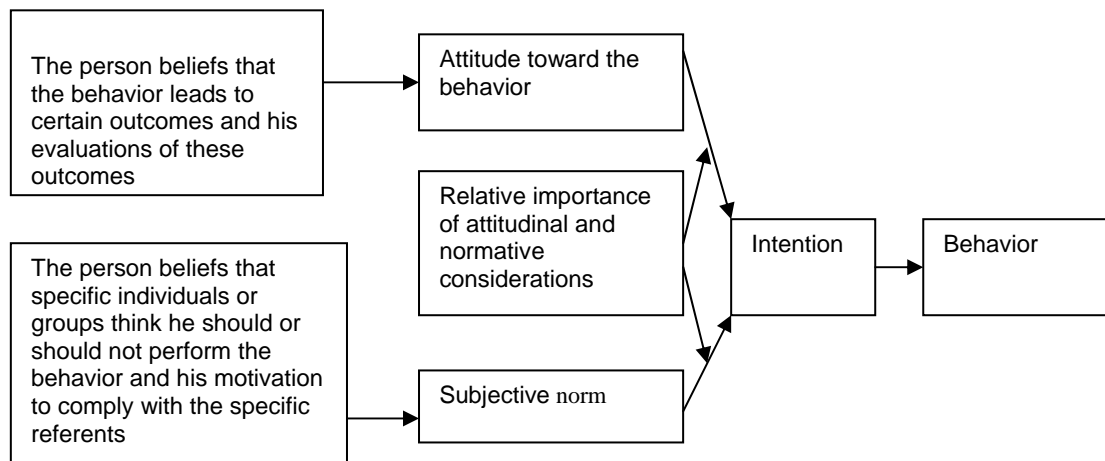


FIGURE 2. Theory of Reasoned Action (Ajzen & Fishbein 2002, 8)

### 2.3.2 Theory of Planned Behavior

Theory of planned behavior (Figure 3) is the model invented by Icek Ajzen in 1985. Theory adds the construct of perceived control to the framework offered by the theory of reasoned action (Eysenck 1990, 32). The inventor calls this model as a successor of the theory of reasoned action. The theory is based on the assumption that human beings usually behave in a sensible manner and they take account of available information and implicitly or explicitly consider the implications of their actions. (Ajzen 2005, 117; Zint 2002, 827.)

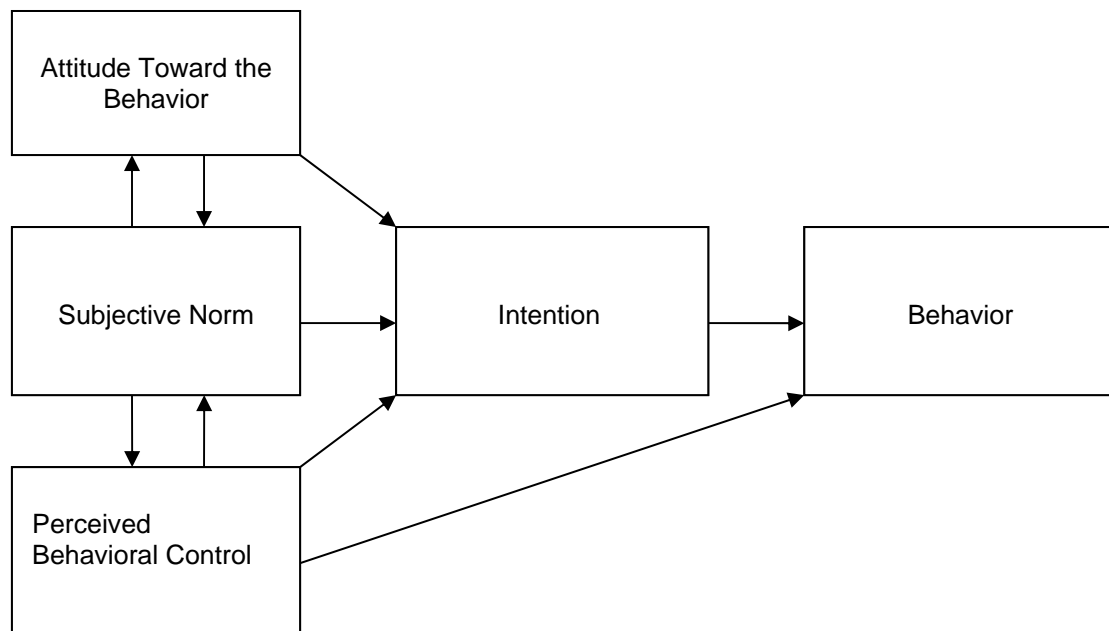


FIGURE 3. Theory of Planned Behavior (Ajzen 2005, 117; Zint 2002, 827)

### 2.3.3 Attitude-to-Behavior process model

Attitude-to-behavior process model (Figure 4) was invented by Russell Fazio in 1989. In contrast to the Theory of Reasoned Action and Theory of Planned Behavior, Attitude-to-Behavior process model states that attitudes can affect person's behavior even when the person does not actively reflect and deliberate about the attitude. In this model, the event or decision is viewed by the subject and it is the main indicator

of attitude which will finally lead to a course of action. (Sorrentino & Higgins 1996, 209-212.)

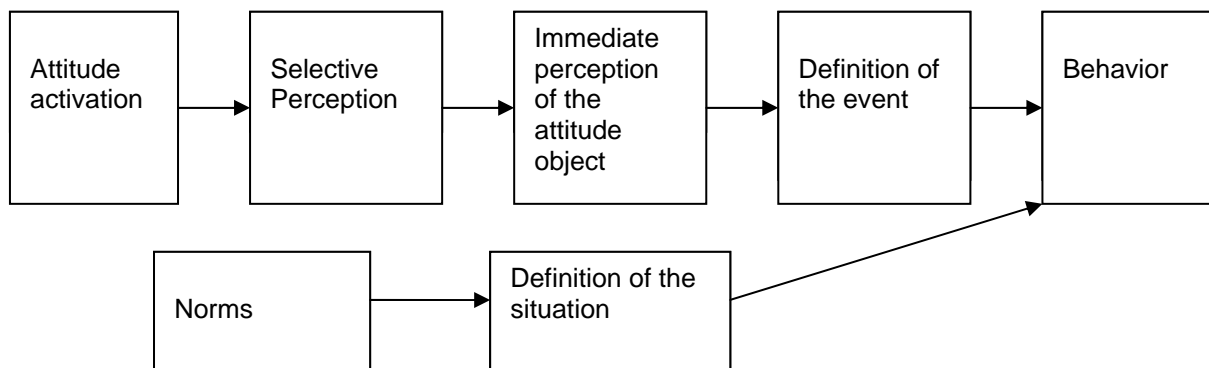


FIGURE 4. Attitude-to-Behavior process model (Sorrentino & Higgins 1996, 212)

## 2.4 Changing attitudes

People can also change their attitudes if necessary. Attitudes can change consciously and with intent. For instance advertisements, propaganda, brainwashing or psychotherapy are targeting for attitude change. Also our parents, peers, social groups and the mass media can affect to attitude change. (Pawlik et al. 2000, 315.) However, attitudes can also change spontaneously. Change in attitudes can also be seen as a change in information (Vilkko-Riihelä 2001, 696). There are three primary ways in which attitudes can be changed. These are *direct experience of the attitude object*, *persuasive communication* and *induced behavior change*. (Eysenck 1990, 33.) According to almost 50 years of research, it is shown that people who are considered expert, trustworthy, credible, popular, or attractive are more effective in changing attitudes (Pawlik et al. 2000, 315). Two of the best known attitude change theories are presented in the following.

### 2.4.1 Cognitive dissonance

The process of attitude change has been studied mostly from a cognitive dissonance perspective. Cognitive dissonance is a theory invented by Leon Festinger. Cognitive dissonance can be defined as an unpleasant affective state that results when an

individual notices that his or her attitudes and behaviors are inconsistent. Because a person wants to avoid the unpleasant situation, attitude must be changed. (Ajzen 2005, 26; Vilkkö-Riihelä 2001, 696; Helkama et al. 1998, 159-160; Pawlik 2000, 316.)

#### **2.4.2 Heider's balance theory**

Balance theory was discovered by Fritz Heider in 1958. Target of the balance theory is triangle situation, where three parties are involved. These parties are me, other and the third person or object. For instance, if a person (me) disagrees with his friend (other) in some issue (third person or object), the situation is not in balance. In this situation, the person has two options to put the situation back in balance. He can change his attitude and start to agree with his friend or end the friendship. (Helkama et al. 1998, 190-191.)

According to Heider, people's beliefs and attitudes tend toward a state of balance or consistency. Most often we like people who agree with us, associate positive properties with objects or people we value attribute negative motives to people we despise and help people we admire. When a situation is in balance, the elements of the situation fit together harmoniously. However, when the situation is not balanced, action occurs to bring the situation back in balance. (Ajzen 2005, 25.)

#### **2.5 Measuring and researching attitudes**

Attitude research is traditionally social psychology's key field of study and several methods have been developed to studying attitudes. The most popular method is questionnaire. Research can target for instance attitudes towards social, moral or ethical issues. (Vilkkö-Riihelä 2001, 697.)

When attitudes are investigated, they must be measured somehow. The majority of the methods of measuring attitudes are focusing on the global evaluation of a person, object or idea instead of trying to measure special beliefs. Two of the most popular methods of measuring attitudes are *Likert scales* and *Semantic differentials scales*. (Stiff & Mongeau 2003, 14.)

Likert scale was invented by Rensis Likert and it was widely adopted, since it greatly simplified the research process (Ajzen et al. 2002, 16). Likert scales contain a number of positive and negative opinion statements. Each statement is accompanied by a set of response scale. Most often the scale ranges from “strongly disagree” to “strongly agree”. (Stiff & Mongeau 2003, 14.)

A semantic differential scale was invented by Charles Osgood and his associates. The scale consists of a set of bipolar evaluative adjective scales. These scales include for instance good-bad, harmful-beneficial, pleasant-unpleasant and positive-negative. To indicate an attitude, the respondent marks the response option that is most clearly indicated his opinion. (Ajzen et al. 2002, 20; Stiff & Mongeau 2003, 15.)

## ***2.6 Environmental attitudes***

When one investigates environmental attitudes he/she is likely to encounter numerous definitions related to the context. This is probably due to the fact that the target group’s individual perceptions of environmental attitudes, values and opinions differ. It is also acknowledged that there exists a vague amount of terms close to the environmental attitudes and most likely the true meaning and difference behind them is not clear to everybody. In the previous chapters attitudes in general were analysed in terms of e.g. Ajzen & Fishbein and environmental attitudes can also be reflected to their model in the same way as any other attitudes and their formulation. Another problematic issue is the fact that different researches indicate different results in terms of consumers’ environmental attitudes, that is some find citizens’ environmental attitudes rather positive whereas the others vice versa.

Recently the increased amount of information campaigns that deal with issues such as the causes, impacts and future risks of climate change, the amount of people who possess knowledge of energy and environmental awareness, has increased within the last few years (Rousse 2008, 388). Currently, the Finns regard climate as the most important issue that has an impact on people’s lives (Ministry of Trade and Industry 2007). Gouldson & Welford (1993) review that it is possible to see changes

in societies' attitudes and it is relevant for organizations to respond to these changes (Gouldson & Welford 1993, 2). In some occasions the terms environmental concern, environmental attitudes, ecological worldview and environmental values are used to describe the same idea (Dunlap, Van Liere, Mertig and Jones 2000 in Barr 2007, 436). However, for example Schultz et al. (2005) distinguish in Hiekkavirta (2006, 10) these terms from each other since according to them, environmental concern refers to the sentimental approach towards the environmental problems whereas attitudes also include perceptions and behavioural intentions towards the environment.

Proops (2001) argues that the problem in researching environmental attitudes includes the possibility that people themselves are not clear what attitudes specifically stand for and putting them into words can be even more difficult, and in some extent attitudes can be internally in contradiction (Proops 2001, 5). Kaiser, Oerge and Bogner (2007, 243) indicate that the object of environmental attitude can either be the natural environment itself, some elements in it or conservation behaviour. When it comes to identifying or defining an individual's attitudes by investigating their behaviour, it is extremely difficult. Kaiser et al. use the example of person riding a bike. For an outsider it is impossible to define whether a person is riding a bike because he/she wishes to a) save money, b) stay healthy, c) to act in an environmentally friendly way. (Kaiser et al. 2007, 243.) As a conclusion to what has been suggested above, it is difficult to formulate one single concept of people's attitudes towards environmental issues. Certain researches indicate that attitudes are studied in terms of how people perceive and relate to the environment and the measuring scale of the attitudes varies from positive to negative (See attitudes in general section 2.1) (Konttinen 1998, 285 in Hiekkavirta, 2006, 9).

## ***2.7 Formulation of the environmental attitudes and behaviour***

In order to fully understand people's environmental attitudes, it is required to pay attention to each individual's biological heritage, physical environment, raising, education and job. When the question is about group attitudes and their formulation, group's cultural history and physical setting play a crucial role. (Tuan 1974, 59.) This basically means that Finnish environmental manager working in a Finnish

organization in Finland is most likely to have totally different attitudes than Ecuadorian person in the equivalent position on the other side of the globe.

The roots for environmental attitudes derive from the beliefs in anthropocentrism, the balance of nature, and concerns about ecological crisis. It has been suggested that adults who possess less political conservatism, higher educational attainment, more feminine beliefs and less religious fundamentalism are likely to have more pro-environmental i.e. “green” attitudes and values. (Dunlap & Van Liere 1978; Dunlap et al. 2000; Gardner & Stern 2002; Gifford 2002; Winter & Koger 2002) in Evans, Brauchle, Hag, Stecker, Wong, Shapiro 2007, 636.)

According to Grob (1995), in terms of personal philosophical values the more materialistic the person’s view of life is, the less appropriately they will behave towards the environment. Environmental awareness attribute includes the idea that the more conscious an individual is about the environmental issues, the more appropriately they are likely to act towards it. In this example environmental awareness includes the elements such as environmental knowledge and acknowledgement of environmental problems. Konttinen (1998, 282) reviews in Hiekkavirta (2006, 14) that people’s environmental awareness is largely dependent also on the individual’s personal history, experiences and issues based on subjective reality. Barr investigates in his research that those individuals who are more open to change, more altruistic and experience greater connection to nature are more likely to act more environmentally sound way (Barr 2007, 437). To support this theory, Ignatow (2006) argues that people’s attitudes on environmental issues are constructed by cultural models of environmental problems and of human interactions with nature (Ignatow 2006, 443). The author also reviews that education of environmental issues plays an important role in a sense that it shapes the environmental attitudes of not only individual level but also on whole societies (Ignatow 2006, 446).

Emotions do play a significant role in the environmental attitude formulation model in a way that if the emotion is highly intense when an individual reacts to the state of environment (e.g. worsening state of environment), the better their perception towards it is. The idea behind “perceived control” attribute suggests that those



people, who see the results of their own actions on the environment, are likely to act more appropriately towards the environment than those who see the results of for example natural law, peers or other attributes. There also exists a prevailing hypothesis that the less people believe in technological solutions curing environmental problems, the more appropriately they will behave. (Grob 1995, 209-210.)

The media functions as a crucial part in nowadays' society and it is said to formulate public opinions about environmental issues and at the same time influences people's assumptions (Heiskala 1993 in Rotko 2004, 45). Rotko also states that people receive and form their assumptions about the environmental aspects partly via the information they obtain from the news or other relevant sources (Rotko 2004, 45). According to the results of European Opinion Research Group (2002), the media through which people find most of the information concerning the environment is television and newspapers (European Opinion Research Group 2002, 3). Heiskanen et al. (1993, 40) review that other relevant sources of information can for example, be different authorities or NGO's.

## ***2.8 Environmental attitudes versus executed behaviour***

A contradiction can be found between the environmental attitudes and true behaviour. As Kujala explains in his part in Heiskanen et al. (1993, 8), consumers demonstrate willingness for financial sacrifices in order to find environmentally sound solutions but in reality often they are not. Another study related to environmental psychology can be found from the 1970's when Heimstra & McFarling (1974) argued that attitudes do not necessarily modify behaviour; people often have negative attitude towards some environmental concern but no actions are committed in order to change anything (Heimstra and McFarling 1974, 21). Likewise, Uusitalo (1986) and Sairinen (1996) analyse in Hiekkavirta (2006, 16) that Finns' attitudes towards environmental issues may seem to be very positive but their behaviour or change in behaviour indicates something different. Finns experience that they already behave and act in an environmentally friendly way. Sometimes the announced attitudes do not equal reality since people want to give more positive image about them.

(Heiskanen et al. 1993, 8-9.) Research that was established to review environmental attitudes among the European citizens in 2002 found out that vast majority of the respondents are willing to act only if the other people also made some contribution (European Opinion Research Group 2002).

Heiskanen et al. (1993) review that the significance of information in the attitude formulation process has been neglected and not been researched enough. These days consumers receive vague amount of information the information related to environmental problems and product/service features is affected by own subjective assumptions. It would be easier to understand environmental attitudes if consumers' different information sources and the way they absorb information was analyzed. (Heiskanen et al. 1993, 39.)

A factor that also has been discussed and researched is whether there is a relation between the environmental attitudes and the level of economics in different countries. In other words, does a developed country have more positive environmental attitudes than so called poor countries? Rauwald and Moore found out that the people of Trinidadians and Dominicans had stronger pro-environmental behaviour than people of the United States (Rauwald and Moore 2002 in Cummings 2006, 17).

Another example was demonstrated by Gooch (1995), who studied in Cummings (2006, 17) that Sweden, representing developed country, had no more likely to adopt environmental concerns than Latvia or Estonia. Then again a recent study related to the environmental impacts of traveling revealed that Swedish respondents showed more pro-environmental behaviour than other Nordic countries in terms of valuing sustainable way of traveling (The Nordic Business Travel Barometer 2007). As a conclusion for this it can be said that different researches indicate different attitudes and numerous times the context what is being studied influences greatly. Thus it might create difficulties by saying that a country X is in general more environmentally friendly in attitudes than country Y, but the question is merely about the different fields of environmentalism and the target group that is being studied.

A good example of the pro-environmental attitude related to air traveling is demonstrated in Sweden where the Swedish environmental party puts forward an

idea that domestic flights would be forbidden in Southern Sweden by the year 2020. According to the environmental party, air flights would be replaced by more sustainable way of traveling, merely by trains. Of all the air emissions in Sweden, 10-20 percent is created by air traveling. (Yle.fi, 10.1.2008).

## ***2.9 Managerial attitudes***

Management has great responsibility to operate in a way that it does not jeopardise the state of the environment in a way that the future generations cannot operate anymore. Stakeholders can be viewed as guard dogs that make sure that companies operate at least in some ways sustainable and ethical way. How this takes place in real life, is another dilemma. Since stakeholder management is a field of business of its own, that shall not be studied further in this research, but instead this was merely used as an example to demonstrate that management attitudes are affected by multiple different factors. In other words, certain external pressure may cause management to think and act in a certain pro-environmental way. Different researches indicate that environmental issues are a factor that has been integrated into corporate thinking within the recent years.

Apart from this research, there have been different researched published for example related to Chinese, Indonesian and Australian managers attitudes towards environmental management. A study conducted by Cummings (2006) was built in order to establish whether respondents in different countries (China, Indonesia and Australia) had different attitude toward environmental management. The outcomes of the research were somehow surprisingly in a sense that the management in China and Indonesia demonstrated pro-environmental attitudes even in more cases than the management in Australia, even though all the countries favoured most of the environmental issues (Cummings 2006, 24). A study conducted by Khan and Atkinson (1987) about the management attitudes between India and the U.K. related to Corporate Social Responsibility issues indicated that the management attitudes are similar in those two different countries (Khan & Atkinson 1987, 431). This would again indicate that there are no differences in attitudes between developed and developing countries at least in general.

Around Europe large companies have awoken to the demanding pressure of stakeholders to improve and green their business activities. Tony Juniper, the director of Friends of the Earth, indicates that companies that have a public profile need to be 'seen as green' and the idea of greening the business has become a mainstream issue. Many companies' success is determined by the profile that they have among publics. (Venables 2007, 27.) This public image might have an impact also on the positive results appeared in this research and the factors are discussed in the discussion part of this thesis.

During the week 8, 2008 in London, U.K. there were two events, where the topic of discussion was the industry's attitudes to climate change. A survey conducted by the U.K. Institute of Directors revealed rather positive attitudes but at the same time questioned the true behaviour beyond attitudes. Travel management's interests seemed to be focusing towards the issues such as the locations of the destinations, which airports were used, price issues and the frequency of the flights. The answers of the directors were more environmentally sound than of those travel managers. According to the research, the problem was how to combine those two management level attitudes in practise in order to establish a solution between price issues and environmental issues. (Business Travel Europe 2008.) Discussion chapter provides suggestions and questions related to this aspect.

McKinsey and Associates' (1991) survey in Andrews (1998) indicate that most senior managers among 400 top international businesses recognized a powerful environmental challenge and parties such as governments, customers and competitors were seen as a primary trigger of pressure for environmental change. Most of the corporate leaders demonstrated readiness to act. Winsemius and Guntram's (1995) survey in Andrews (1998) revealed that managers in the more bottom level of the hierarchy did not possess as sanguine attitude in meeting the environmental targets as the top management.

## **3. BUSINESS TRAVELING**

### ***3.1 The role of corporate environmental management within business traveling***

In this research, business travel is defined as a traveling, that is made due to business or working using either public or private transportation. Destination of traveling can locate either on domestic front or abroad. However, traveling between home and workplace is not considered as a business traveling.

As in every functions of the organizations have impacts towards the environment, business traveling is not an exception. Numerous researches indicate the increase of global business traveling (Borg in Karttunen 2007), and thus the emissions and especially the carbon footprint of the organization increases as well. The objective of corporate environmental management is to decrease the environmental impacts of the organizations and thus it plays an important role in planning the corporate business traveling. With the aid of corporate environmental management it is possible for the organization to acknowledge the most significant environmental aspects and impacts of business traveling, and later on minimize them or find alternative means for travelling, such as teleconferencing.

### ***3.2 State of the business traveling in the Finnish companies***

The state of business traveling in Finland has been focused and it is been measured rather recently. Researches and reports are made on a local and global scale. In Scandinavia, state of business traveling is been investigated rather widely with the study called The Nordic Business Travel Barometer. This research in question gives information for instance means of transport, traveling budgets and passengers evaluations of hotel chains and air line companies, and it is created three years in a row, the latest research being published in 2007. Target group of the research is Norwegian, Swedish, Danish and Finnish decision makers and business travelers.

The NBTB is created by consulting companies Resegeometri and Exido International. (Borg & Ognér 2007.)

The Nordic Business Travel Barometer is made in co-ordination with national business travel associations. In Finland, the partner in cooperation was the Finnish Business Travel Association (FBTA). FBTA has been investigating business traveling of the Finnish companies as a part of the Nordic Business Travel Barometer. Results from Finland indicate that business traveling as a whole is strongly increasing. Especially use of train within business traveling has risen. In addition, the safety of business travelers has been taken into consideration and 45% of the Finnish companies have created a safety policy for their business travelers. As well, the environmental issues are taken into consideration more precisely. (Karttunen 2007.)

### ***3.3 Environmental aspects and impacts of business traveling***

According to the Nordic Business Travel Barometer, business traveling is mainly done by car, train or plane (Borg & Ognér 2007). These transportation vehicles are using gasoline as a fuel. Gasoline is a fossil fuel and when it combusted in an engine, carbon dioxide is emerged. Carbon Dioxide is a greenhouse gas and it is causing global warming. When fossil fuel is combusted also methane and nitrous oxide is emerged. Methane and nitrous oxide are also greenhouse gases. However, the amount is significantly smaller than the amount of carbon dioxide. (Chiras 2001, 484-485.) Nitrous oxide is also causing acid deposition (Chiras 2001, 472-473). Carbon dioxide emissions have been rising during the whole 20<sup>th</sup> century and one of the reasons for this is the increased use of energy and the increase of transportation (Boyle, Everett & Ramage 2003, 15-16). Thus, one of the most important aspects of business traveling is the carbon dioxide emissions which enhance the process of global warming and climate change. However, in aviation the role of other emissions and their impacts on the atmosphere has been discussed recently in the academic writings, and it is claimed that altogether the progress of climate change is a lot greater than by taking only carbon dioxide into account.

### ***3.4 The corporate travel policy and travel management***

At present, the amount of business traveling has grown so high that organizations must make certain rules how to arrange it. These rules are called as the corporate travel policy. All the employees in the organization including the top management are committed to follow the policy. Corporate travel policy dictates for instance what means of transport are used in a certain situations, what hotels business travelers are accommodating and what is the budget of the travel. (Rothschild 2002, 66.)

Usually biggest Finnish companies have a director or manager who is in charge of organizing business traveling in the organization and also to monitor that corporate travel policy is been followed. The title of the person who is in charge of these duties can vary, but most often in the international organizations the title is Travel Manager. Travel Manager's duties include for instance taking care of the traveling arrangements, keeping the costs of the traveling as low as possible, negotiating the contracts with airline companies, travel agencies and hotels and also to monitor that corporate travel policy is been followed. The tasks and responsibilities of the travel management are described more specific in Figure 5 (FBTA).

	STRATEGY AND POLICIES	PURCHASING CONTRACTS	PROCESS	REPORTING FOLLOW-UP
AREA	<ul style="list-style-type: none"> <li>• collective bargaining</li> <li>• travel policy</li> <li>• instructions and legal regulations (taxation, vat)</li> <li>• service concept</li> <li>• risk management</li> </ul>	<ul style="list-style-type: none"> <li>• designated suppliers</li> <li>• concept of contract negotiations</li> <li>• contract models</li> </ul>	<ul style="list-style-type: none"> <li>• means of payment</li> <li>• integration (direct/intermediaries)</li> <li>• service quality management</li> </ul>	<ul style="list-style-type: none"> <li>• levels</li> <li>• analyses</li> <li>• conclusions</li> <li>• advising/consulting</li> <li>• budgeting</li> </ul>
TASKS	<ul style="list-style-type: none"> <li>• coordinating tm, defining strategies and aims</li> <li>• creating and developing policies and practices</li> <li>• follow-up of authority regulations and directives</li> <li>• enhancing travel safety</li> <li>• keeping abreast with current affairs and development in TM, suggestions for action</li> </ul>	<ul style="list-style-type: none"> <li>• defining and implementing purchase strategy for TM</li> <li>• negotiating purchase contracts, guidance and follow-up</li> <li>• developing supplier relations and service concepts (travel agent's, other service providers and producers)</li> </ul>	<ul style="list-style-type: none"> <li>• developing of payment systems</li> <li>• acting as a coordinator between travel agents and service providers</li> <li>• developing and implementing action plans and process models</li> <li>• developing and monitoring customer satisfaction</li> <li>• creating and developing a booker network (travel planners, coordinators and other actors)</li> </ul>	<ul style="list-style-type: none"> <li>• mapping out cost savings, suggestions for actions, follow-up</li> <li>• developing a follow-up system for monitoring travel structure, spend and volume</li> </ul>
COMMUNICATIONS TRAINING NETWORKING INFORMATION TECHNOLOGY				

FIGURE 5. The tasks and responsibilities of the travel management (FBTA, 2007)

Most often, the top management demands cost efficiency from travel managers and travel management. The high cost of business traveling is forcing companies to find new ways of reducing travel expenses. (Douglas & Berendien 2006, 1130.) Costs of traveling must be put as low as possible without any disadvantage to the efficiency and safety. This is necessary due to fact that the costs of traveling are rising constantly. Especially the flying and hotel rates are increasing. (Anderson, Lewis, Parker 1999; Sharkey 2006.) This forces the organizations to tighten their travel policies, which means less flexibility for business travelers because corporate



managers emphasize channeling spending to the volume discount deals negotiated with airlines and hotel chains (Sharkey 2006). However, the most important feature to effective travel management is not how much money an organization can save but what organization can benefit from making its travel management more effective (Lehman & Niles 2001). Benchmarking helps companies to build more effective travel management. This can be done by comparing organization's actions and policies to other companies' actions and policies. (Bell & Morey 1995, 11)

### ***3.5 Corporate travel policy and the environment***

The Nordic business travel barometer expresses that companies are taking environmental issues into consideration more precisely when planning their business traveling (Borg & Ognér 2007; Karttunen 2007). Most often, the reason for this is the pressure coming from the stakeholders. This indicates that the change does not initiate from inside the organization. The trigger to change comes from customers, NGO's etc. Several different stakeholders are putting pressure to organizations to start acting more environmentally friendly way (see managerial attitudes in section 2.9). That is the reason why the organizations should take corporate environmental responsibility and corporate social responsibility into consideration in their everyday actions and also in their corporate travel policy. (Bowd, R., Bowd, L., Harris 2006, 147-155; Silberhorn & Warren 2007.)

Corporate travel policy that also takes environmental issues into consideration is been under development lately. Several tools have been created to assist travel management and travel managers. One of these tools is Institute of travel managements ICARUS toolkit. The purpose of the ICARUS toolkit is to reduce the carbon footprint caused by business traveling. The basis/base of the ICARUS toolkit is to plan corporate travel policy that takes environment into consideration and implement it to all levels in the organization to minimize the carbon footprint caused by business traveling (Institute of travel management, 2008).

## 4. CARBON FOOTPRINT

### *4.1 Definition of carbon footprint*

Within the recent years the use of the term carbon footprint has increased a lot especially in the media but also in the business world. Due to the fact that global climate change has become a part of political agenda, numerous different carbon footprint calculators have gained popularity. Even though carbon footprint is used rather often, the function and academic definition are not absolutely clear. In the following there are some parties' definitions for the term.

Organisation's carbon footprint can be defined as the footprint that certain organisation leaves on the Earth's climate as a result of the carbon dioxide emissions. Carbon footprint is expressed as tons of CO<sub>2</sub>. (Janse & Viers 2007, 157.) According to British Petroleum (2007), carbon footprint equals the amount of carbon dioxide that is created by daily activities from washing laundry to taking children to school (BP 2007). Energetics (2007) describes carbon footprint as being the direct and indirect carbon dioxide amounts that are created by business activities, whereas Grubb & Ellis (2007) indicate carbon footprint as the amount of carbon dioxide that is caused by the combustion of fossil fuels. In business organizations the footprint is created by direct or indirect operations. (Energetics 2007; Grubb & Ellis 2007.) Similar definition can be found from carbonfootprint.com, where carbon footprint indicates the impact that anthropogenic greenhouse gases has on the environment (Carbonfootprint). National Geographic Channel recognizes that carbon footprint indicates the impact of our actions on the environment, measured as carbon dioxide units (National Geographic Channel 2008).

Carbon footprint is measured as carbon dioxide tons/kilos. It is commonly unclear should carbon footprint include exclusively carbon dioxide emissions or other greenhouse gases such as methane or nitrogen oxides. By including all the greenhouse gases to the term will remove the focus away from carbon footprint to climate footprint. Additional problem might also be the fact that should the footprint

contain only the combustion of fossil fuels, or other sources such as the processes taking place in the nature. Carbon footprint can be calculated both direct and indirect processes. Should the indirect processes be taken into consideration, for example for certain organisations the exact limits might be difficult to draw. (Wiedman & Minx 2007.)

As presented afore, carbon footprint can be defined and limited differently and due to this, it is important that different parties that deal with the matter have similar view of seeing the issue. There are numerous different terms within the context of environmental emissions and naturally people or organisations that have not needed to deal with the topic might become confused. This research, however, focuses solely on the carbon footprint of business traveling instead of taking ecological footprint or ecological rucksack into account.

#### ***4.2 Carbon footprint within traveling***

Recently, there has been a growing concern over the environmental impacts of aviation. This derives from the fact that air traveling has dramatically increased lately and so is the acknowledgement of environmental issues. (Carlsson & Hammar 2002, 365.) The ever growing traveling with motor vehicles and especially airplanes has increased the carbon dioxide emissions. Numerous developed countries import goods that have been produced inexpensively abroad. (National Geographic Channel 2008.)

This thesis focuses largely on business traveling and the carbon footprint that originates from it. Weight is put on the fact that most business traveling emissions derive from air traffic and thus aviation is stressed numerous times. Transportation in general equals approximately 14 % of all greenhouse gas emissions, out of which 75 % and 12 % derive from road transportation and aviation, respectively. (hm-treasury.) Similar figures are indicated by Intergovernmental Panel of Climate Change (from now on used as IPCC in this thesis), which argues aviation producing approximately 3,5 % of all the carbon dioxide emissions (Woodsock, Banister, Edvards Prentice, Roberts 2007). According to different literature the amount varies a bit and for

example Scheelhaase & Grimme (2007) determine the amount between 2,5-3 %, whereas Olsthoorn (2001) wrote in 2001 that international aviation accounts only 1 % of total anthropogenic carbon dioxide emissions (Scheelhaase & Grimme 2007, 253; Olsthoorn 2001, 87). Within the recent ten years the percentage of CO<sub>2</sub> emissions deriving from aviation has likely increased greatly in research literature and as Woodsock et al. (2007) and Olsthoorn (2001) demonstrate, due to great increase of air traveling, the current CO<sub>2</sub> emission percentage is likely to increase as high as 15 % of all the carbon dioxide gases until the year 2050 (Woodsock et al. 2007; Olsthoorn 2001, 87).

The role of aviation is, however, greater within the emissions of all greenhouse gases due to the formation of cirrus clouds by nitrogen oxides, soot, sulphate particles and water vapor out of air planes. Even though there have been technological improvements in the engine parts and fuels, the growing interest towards flying and traveling in general compensates these improvements. (Woodsock et al 2007.) IPCC indicated in its report in 1999 (in Kahn et al., 2007) that problematic issue is the lack of acknowledgement and covering of the so called non-CO<sub>2</sub> climate impacts, which basically are the same as Woodsock et al. indicated above e.g. nitrogen oxides (Kahn et al. 2007, 376). It has to emphasized, though, that different literature provides different figures within the amounts of emissions that are created and it is impossible to find a single estimation or definition, as seen in figure 6.

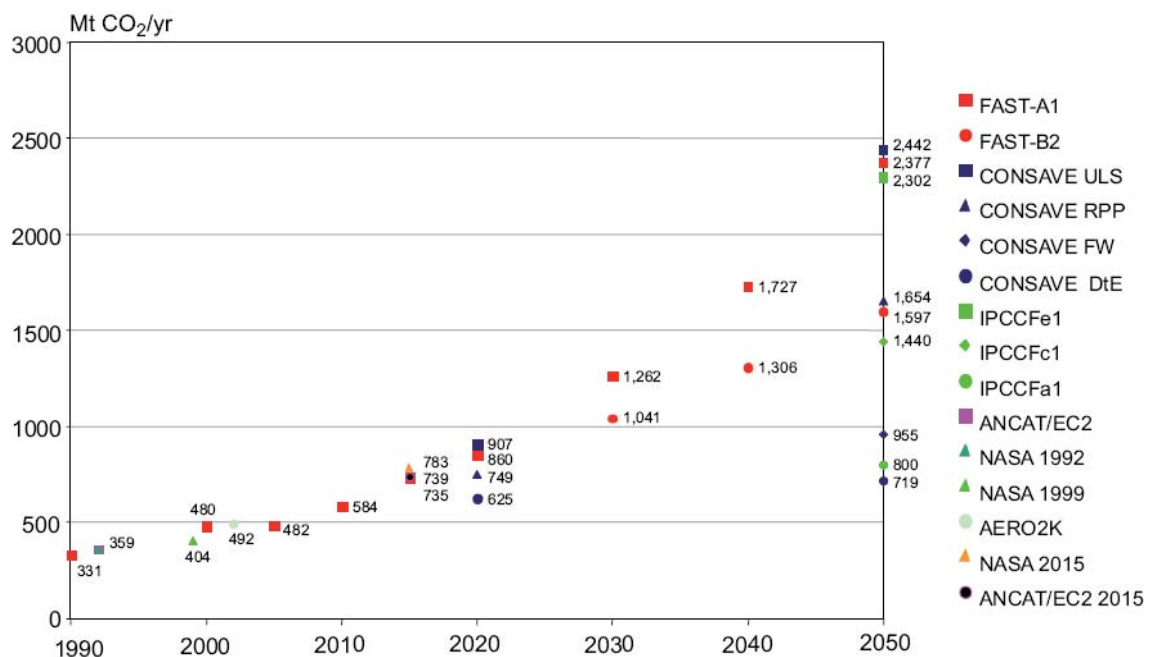


FIGURE 6. Comparison of global CO<sub>2</sub> emissions of civil aviation by different institutions, 1990-2050 (Kahn et al. 2007, 335)

### 4.3 How can the carbon footprint of business traveling be reduced?

There are several ways of reducing the carbon footprint caused by business traveling. Approaches to reduce carbon footprint can be divided in two categories. These categories are technological and social. Technological approach involves the technologies that require less input energy to achieve a given level of useful energy output or energy service and smaller carbon footprint. The social approach involves re-arranging business traveling in a minor or major ways to ensure that the carbon footprint is reduced. (Boyle et. al 2003, 39.)

Technological approaches include developing options for business traveling. The main idea is that it is not always necessary to travel but this can also be done by means of new technology. In fact, the impact of information technology has already influenced the travel industry as a whole. (Zheng & Sandro 2007, 1193.)

Video-conferencing is a new technology that can reduce organizations business traveling, carbon footprint and also the travel costs. According to the research made in Norway, Companies adopted video conferences because they can save time, reduce travel costs, improve internal contact, increase efficiency for decision making, reduce travel fatigue, improve contacts with clients and suppliers and also to save the environment. However, personal meetings are still considered as the most effective way of doing business so it is unlikely that video conference can replace business travel entirely. (Denstadli 2004, 371-376.) Thus video-conferencing has been found to remain supplementary to personal contact. (Douglas & Berendien 2006, 1130.)

In terms of business traveling that implements the use of aviation, the global warming potential is not the best possible measuring mean of aviation emissions. This is due to the fact that global warming potential examines the impacts of one tonne of emitted gas, whereas the impacts of one tonne of aviation emissions will be affected on other elements as well. These elements include physical location of the emission, altitude, temperature, season, light intensity and the concentrations of other pollutants in the atmosphere. (Jardine 2005 2.)

Generally in transportation, automobiles represent the greatest potential for reductions. For instance, hybrid cars are energy-efficient and by replacing cars with hybrid cars, companies could reduce their carbon footprint caused by business traveling remarkably. Carbon footprint can also be reduced by keeping the car tuned and tire pressure at the recommended level. (Chiras 2001, 341-342.)

Social approaches include the following ways of reducing carbon footprint caused by business traveling. It is not always necessary to use the car for business travel. For long trips, it is recommendable to use train or bus. Train and bus are causing smaller carbon footprint than car. (Chiras 2001, 341.) Also car sharing is a way of reducing carbon footprint, for instance, if colleagues are travelling to the same direction, they can share one car. (Realbusiness.)

#### **4.4. Carbon Offsetting**

Due to the problematic issues facing the environment and climate, companies and publics have been encouraged to offset i.e. compensate their produced carbon dioxide emissions. In the case of traveling and especially aviation, the idea is that consumers, who purchase the flight, will pay additional fee that goes to procedures that compensate the lost CO<sub>2</sub> emissions caused by traveling. As Jardine (2005) acknowledges in his research, there has been a desire from corporations and amount of individuals to reduce their carbon footprint, and this factor has lead to the principle of offsetting.

Citizens pay to offset their personal emissions and the fee received will be used for example to renewable energy projects or funding of energy efficiency (Jardine 2005, 1; Rouse 2008, 388) These aforementioned contributions will lead to a reduction in greenhouse gas emissions equal to the amount that is been offset. (Jardine 2005, 1.) Rouse (2008, 388) reviews that there exist people who feel they are doing everything they can for the environment and are willing to do some additional contributions such as pay for their caused emissions.

One of the problems related to carbon offsetting is the assumption that there is no certainty about the target where the donation would be put. This is due to the fact that there are several different institutions that deal with offsetting related issues. There exists discussion, which institution would be reliable, and with who to do business and some experts question the whole idea of carbon offsetting (Luoma & Floman in Kokko 2008). This theory is supported by the interview given by the communication manager of Finnair, Christer Haglund, who indicates that the reason why Finnair is not offering the possibility of offsetting to their customers is because the organization has not found reliable enough offsetting organizations (Helsingin Sanomat 2008).

Monetary donations to offset carbon dioxide emissions are generally carried out via internet, but occasionally the procedure takes place online, in the context of information campaigns and with the aid of partnerships e.g. travel agencies or tour operators.(Rouse 2008, 389.)

## **5. METHODOLOGY**

### ***5.1 Purpose of the study***

With regard to the thesis topic and the research question, the purpose of the study is to discover the attitudes that the Finnish top 150 companies' environmental and travel management, or the persons who are responsible for the aforementioned issues, have towards the carbon footprint that is caused by business traveling of the organization. In order to reach this goal, a quantitative approach and specifically survey was chosen to be used here.

It needs to be emphasized that this research analyses environmental and travel management attitudes so thus they should not be referred as the organizations or the entire corporate management level attitudes. The results indicate merely those two managements' personal attitudes.

### ***5.2 Previous studies related to the topic***

It is not known that in Finland there have been previous researches related to the management attitudes towards the carbon footprint of the organization. However, management attitudes towards corporate social and environmental issues have been investigated locally for example in the U.S., the U.K., in Scandinavia and in Asia and Australia. In the following there are a few researches and their response rates presented.

Subhabrata conducted a research in the U.S.A in 2001, which objective was to study managerial environmental attitudes and corporate socialism. The target of the research was American Marketing Association (response rate 33%), New England environmental services (43%) and National Wildlife Foundation's Membership Roster (40%). (Subhabrata 2001, 49.) Andrews studied corporate leader's perceptions towards the relationship between environmental objectives and business strategy in



the U.S. in 1998. The objective of the research was the management in the Fortune 500 companies, and 23% of the management answered the survey. (Andrews 1998, 531.)

In 1989, Atkinson & Khan conducted a research related to the managerial attitudes towards social responsibility and the purpose of the study was to compare the attitudes that the British and Indian managers possessed. In the U.K. the response rate of the survey was 32,5% and in India of the total 400 managers only 41 answered the survey, leaving the response rate as low as 10%. (Atkinson & Khan 1989, 420.)

A study accomplished in 2006 by Cummings, investigated managerial attitudes towards environmental management and in Australia, The People's Republic of China and in Indonesia. The sample included 200 managerial students and 200 managers in public and private corporations. The response rates in Australia, The People's Republic of China and in Indonesia were 59%, 51% and 59,5%, respectively, thus having the average response rate 56,5%. (Cummings 2006, 20.)

In Scandinavia, the Carbon Disclosure Project conducted a Nordic Report 2007 with the topic being the disclosure of investment-related information concerning the risks and opportunities facing these companies due to climate change. The target companies that were chosen for the research were the top 125 Nordic companies in terms of turnover. The average response rate equalled 61,5%. (CDP Nordic Report 2007, 29.)

### ***5.3 Research question***

Our research question is: What are the top 150 Finnish companies' management attitudes towards the carbon footprint of their business traveling? The purpose of the research question is to find out how the environmental and travel management of the top 150 Finnish companies feel about the carbon footprint that is created by their business traveling and if they are willing to decrease or compensate it. The list of the 150 biggest Finnish organizations can be found in the appendix 3.

Sub-questions are demonstrated as: Are there differences in the attitudes between the environmental and travel managers? Will the attitudes differ in different lines of businesses e.g. energy production vs. metal industry? Will the attitudes differ according to turnover and to the amount of employees within companies? Are there differences in the answers in terms of education of the respondents?

#### **5.4 Quantitative study**

The researchers` objective is to produce new information that is based on the received data. Theoretical framework is to establish awareness for the reader about the significant aspects such as the attitudes in general, environmental attitudes and carbon footprint and thus the question is reflecting the outcome to previous theory that is being written about the matter.

Quantitative study, which is also known as hypothesis-deductive or experimental study, is commonly used in social sciences. The basic features of quantitative study are for example conclusions from previous researches, defining different concepts, previous theories. It is important that the data collection has been planned detailed in beforehand and it should be based on quantitative, numerical measurement. An accurate focus group is determined and from this group there is a sample taken to be studied. As for the variables, they are formed in spreadsheet and data is conducted into statistically presented form. (Hirsjärvi, Remes, Sajavaara 2007, 135-136.) As Silverman (1993) describes in Metsämuuronen (2005), in quantitative research the observation process is preliminary work which focuses for example on conducting the questionnaire. Interview in this methodology implies for presenting structured questions for a random or non-random sample. (Metsämuuronen 2005, 203.) More about surveys and samples shall be discussed in the following sections. Due to the fact the population that is being is studied is 150 companies and the focus is on those companies, the nature of the study is naturally quantitative. Since the research questions concentrate on attitudes and general opinions, the issue in this case is not about qualitative study.

## **5.5 Survey**

Hirsjärvi et al. define survey as a form of perception, interview or question in which the data is collected standardized and where the target people or aspects form a sample out of the population. Thus if there is a need to find out something, it needs to be asked from all the recipients in the exact same way. A survey has long traditions and nowadays several different sorts are being used. When it comes to the data that has been collected by using a survey, it is usually analysed quantitatively. (Hirsjärvi et al. 2007, 188-189.) Fowler (1986) reviews that surveys exist in order to produce quantitative or numerical descriptions of different aspects from the study population. Collecting information is achieved by asking people questions, and their answers build up the data. (Fowler 1986, 9.) Fowler (1986, 12) concludes that in order to design a brilliant survey, there are different components such as sampling, question design and interviewing that should be known how to use successfully.

Because the amount of researched companies is rather high, it would be impossible to use personal interviews or similar sorts of means of study. Thus the use of survey fits perfectly for this case. In here, the survey consists of structured questionnaire that is being sent to each representative that was predetermined, that is the environmental management and travel management. With the aid of a survey, all the necessary and useful information can be collected and analyzed. These top 150 biggest companies were chosen according to Talouselämä magazine's annual ranking of the biggest Finnish companies.

### **5.5.1 The advantages and disadvantages of a survey**

One of the most crucial advantages of a survey is considered to be the fact that they enable the researcher to collect a broad research data. A large amount of people can be included for the study and it is possible to ask numerous different things from them. It is possible to send the survey to a number of one thousand people for example. If the questionnaire is well designed, the data can be collected easily and analysed with the aid of a computer programme. However, the interpretation of the results might become problematic. (Hirsjärvi et al. 2007, 190.)

Some disadvantages include for example that it is highly difficult to be sure how seriously the respondents have related to the research and whether or not they have answered with care and honesty. Neither is it possible to acknowledge how clear and successful the questionnaire and the choices have been from the point of view of the respondents. Misunderstandings can be difficult to control. When planning the questions it is not known how well the respondents are aware of the context and the whole topic, and planning a good survey it requires time and skills from the researcher. (Hirsjärvi et al. 190.)

## **5.6 Sampling**

As for the sample that is taken from the population, Metsämuuronen investigates that the target group or the respondents can be chosen for the research by randomly or non-randomly. In terms of the credibility of the research, random based sample is a better one since each respondent has been included completely randomly without any specific purpose from the researcher. Then again, there are occasions where it might be necessary to study the whole population. In this example the idea of having a sample does not take place anymore. (Metsämuuronen 2005, 53.) The needs for sampling according to Saunders, Lewis and Thornhill (2007) include the aspects such as impracticability for one to survey the entire population and the budget and time constraints relating to the possibility for surveying the total population. It should not be regarded that census is more likely to provide more useful results, instead of using a sample that can be trusted to represent the whole population. (Saunders et al. 2007, 206.) The researchers do have the possibility and the will to investigate the entire population i.e. the top 150 companies. The sample equals the amount of responses that will be received from the research. This shall be investigated further in chapter 5.9, Participants and the response rate. In addition, since the target is to study the biggest and the most important Finnish companies, it would not make a sense to leave out any of them.

## **5.7 Questionnaire**

Questionnaires are one of the most widely used data collection tools within the survey method. Due to the fact that each respondent is asked to answer to the same set of questions, it is possible to observe a large amount of people, opinions, attitudes et cetera. (Saunders et al. 2007, 355.) However, when planning to use a questionnaire, some of the key elements that need to be taken into account boil down to the fact that the information that is searched, should answer the pre-determined research question or problem (Saunders et al. 2007, 355; Fowler 1988, 99). A good reason to use questionnaires is for descriptive or explanatory research when for example attitudes and opinions are to be found out and as Hirsjärvi et al. (2007) review; with the aid of well designed questions it is possible to observe the following; facts, behaviour and action, information, values, attitudes and beliefs and opinions. (Saunders et al. 2007, 356; Hirsjärvi et al. 2007, 192.)

The design of a questionnaire is highly crucial since it affects on the response rates, validity and reliability. These aforementioned issues may be maximised by designing individual questions with care, establishing a questionnaire form that is clear in all means, defining the purpose of the questionnaire and last but not least using a pilot testing. (Saunders et al. 2007, 356.) Borg and Gall (1989, 427) argue in Hirsjärvi et al. (2007, 193) that numerous questionnaires that are being used are many times non-academic. Thus these quickly established and poor questionnaires are one of the most significant reasons why numerous people such as teachers and rectors have formed a negative attitude towards using questionnaire as a tool for research. Nowadays due to the vast amount of questionnaires many times it is rather difficult to obtain people to answer them. Surveys are conducted via the Internet as well. (Hirsjärvi et al. 2007, 193.) In surveys the greatest interest does not lie strictly in the produced answers but their relationship to something they are supposed to measure. Hence, the answer is valuable when it can be shown to have a predictable relationships or subjective states that are of interest. (Fowler 1988, 74.)

While designing questions, Likert-style rating scale is one of the most common. When different statements and questions are asked, respondent will determine how strongly he or she agrees or disagrees. Usually the scale differs between four and seven ratings. It is usual to include both positive and negative statements to make sure that the reader reads each question carefully. (Saunders et al. 2007, 372.) Kervin (1999) indicates in Saunders et al. (2007, 373-374) that one sort of variation of rating style is semantic differential rating scale, which are used in measuring attitudes for example in consumer research. The scale includes a pair of opposite adjectives. The respondent may choose for which adjective he or she feels stronger tendency toward.

The questionnaire in this research is conducted by using the University of Jyväskylä's multipurpose study data system Korppi. Korppi includes a tool which makes it possible for students to conduct their own questionnaires. More specific information about using the electronic questionnaire will be presented in the empirical part. The use of electric questionnaires has become more and more popular within the recent times due to the easy conduction possibilities via online. Surveys that exist online are far easier to access by the respondents and it is easier to answer for the questions by only clicking the suitable option with a mouse. Some databases that can be used for creating questionnaires can establish some forms of graphs and figures of the answers thus helping the researchers to form an initial overview of the results and conclusions. Compared to traditional questionnaire in paper form the problems equal basically the same, but there are many advantages in online surveys as presented afore. Questionnaire for which the managers answered can be found in the appendix 1 and the covering letter for the questionnaire is to be found in the appendix 2.

## ***5.8 The methods of analyzing the data***

After the answers from the survey have been returned, they are analyzed with SPSS (Statistical Package for the Social Sciences) computer programme. This enables the researchers to have generalized data about the managers' attitudes. Percentages, frequencies, means and standard deviations are taken from the answers with SPSS programme (SPSS figures with the results found in the appendix 5). The aforementioned issues shall be presented in the chapter 6.1. For further analysis

there will be elements such as cross-tabulations and correlations taken into account as well as computing the sums of the variables. This enables the researchers to compare the differences in management levels, will the attitudes differ in different lines of businesses e.g. energy production vs. metal industry, will the attitudes differ according to turnover and to the amount of employees within companies and are there differences in the answers in terms of education of the respondents, age and sex and thus answer the research questions. The analysis of the data is indicated and discussed in the chapter 6.2 and partly in discussion chapter, chapter 7. The reliability of the data is analyzed in accordance of Cronbach's alpha.

As for the Likert scale alternatives, it is important for the reader to be aware of the fact that number 1 totally agrees with the statement, number 2 partly, number 3 neither agrees nor disagrees, whereas the 4 partly disagrees and 5 totally disagrees. The option 6 represents the statement "cannot say"

### ***5.9 Problematic issues related to the research***

The main problems relate to the collection of the sample, since in the first part of the desk research, the researchers need to find out the people in charge of environmental and travel management. It is known that not all the time there is such a possession as travel management who is responsible for business traveling in the organization. One of the crucial issues is to receive answers to the survey from the always busy management level. To avoid this possible problem, the survey is kept relatively short and clear, and the idea is to use the electronic database where the questionnaire is established. One challenging factor is to maintain the response rate as high as possible. In order to enable this, the questionnaire will probably need to be sent numerous times to the respondents.

One aspect might be the theoretical possibility that the two different managements will conduct the research together and thus the differences might not be measurable. However, the researchers do not believe this alternative to be very probable. Even though this would be the case, it would be difficult to prevent.

## ***5.10 Personal interests and benefits for the researchers***

The topic of the research is extremely relevant at the moment. This can be seen due to discussion that is been going on in the media and literature within the fields of climate business and global warming. One of the significant topics of discussion is carbon footprint caused by aviation and especially the increased amount of business traveling. By having a contact with the biggest Finnish companies makes it possible for the researchers to address them possibly in the future as well, in terms of jobs for example. It is also interesting to see how companies relate to environmental issues and if there are any differences in opinions when it comes to industrialized and commercial businesses.

## ***5.11 Participants of the research***

The questionnaire was sent to the environmental and travel managers of top 150 Finnish companies. These companies were determined according to Talouselämä magazine's top-500 list. Further information about the companies can be found from Talouselämä's website. Of the 150 companies there were 22 companies that did not have environmental managers and nine companies without person responsible for travel management; hence the amount of sent questionnaires was 269. It has to be mentioned that the list contained numerous companies that belong to the one and same group of companies and within that group there is one person who deals with environmental or travel management issues within every organization. One questionnaire was abandoned since it was noticed to have been answered twice. One environmental manager did not wish to answer due to the lack of knowledge in the related field and one respondent felt the questions were leading. As for the education of the respondents, there were numerous levels and fields of educations represented such as Master of Business Administrations, Master of Science in Technology, Vocational Qualification in Business and Administration, Bachelor of Business Administration, Engineer and academic degree in some other field of study. The division of sexes and positions of the participants of the research can be seen in figure 7.



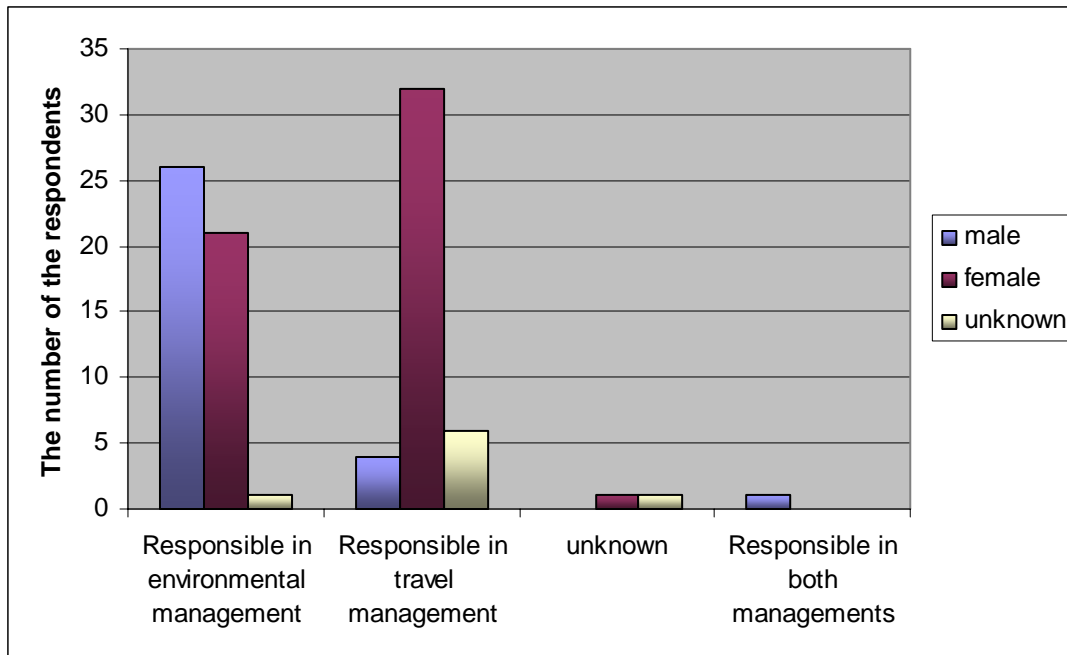


FIGURE 7. Participants of the research

### 5.11.1 Response rates

Of all the top 150 companies the number of participant companies was 76. In percentage this number equals 51%. From those 269 managers in top 150 companies, 93 conducted the questionnaire. This number equals 35%. Of those who answered the questionnaire, 48 were environmental managers and 42 travel managers. One respondent was responsible for both management level and two respondents did not announce their position in the organization.

In total, there were 31 male and 54 female participating to the survey. Eight people did not announce their sex. Of the 48 people responsible of environmental issues, 26 were male and 21 female. One person did not announce his/her sex. Among the 42 travel managers, 32 were female and 4 male. Six people did not indicate their sex. Of the total amount of respondents, one male claimed to be responsible for both the environmental and travel management and one female did not announce her position in an organization X.

## 6. THE RESULTS OF THE RESEARCH

### 6.1 Presenting data

#### 6.1.1 The amount of business traveling and the carbon footprint in companies

64 managers of the total 93 respondents who answered this question believe business traveling has increased in their organizations within the last five years. In percentage this equals 69% (figure 8). The Mean in this statement is 2,3 and standard deviation for this question is 1,33.

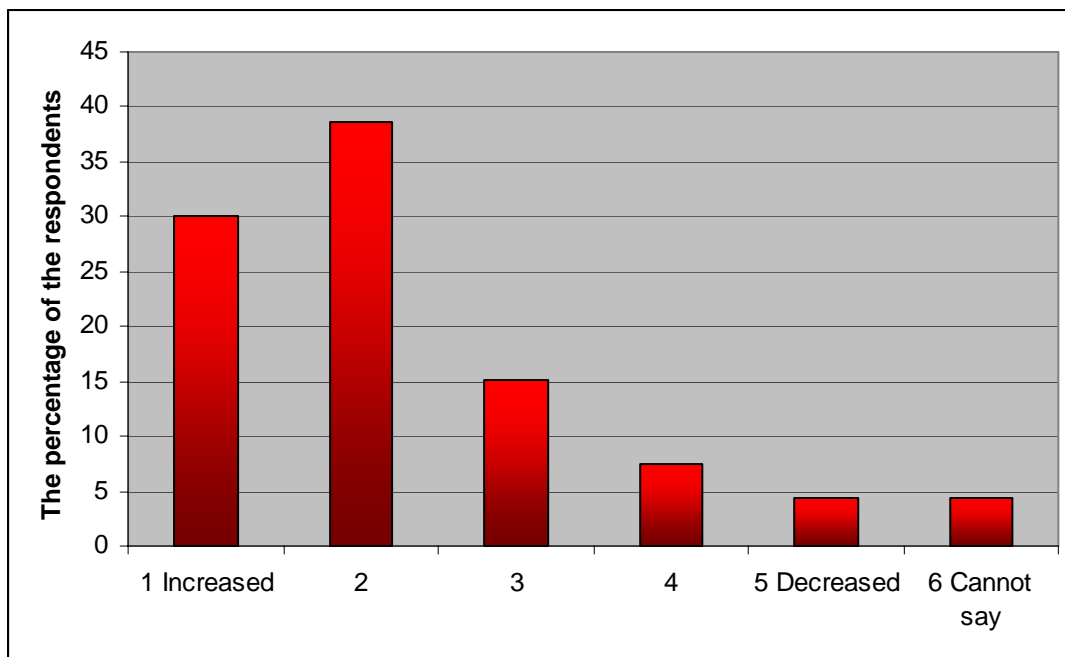


FIGURE 8. The amount of business traveling within five years

For the question about the relation of the carbon footprint of business traveling in comparison to the overall footprint of the organization, 53 managers of the total 93 stated the footprint being small or relatively small. In percentage this equals 57 %. The Mean in this question was 2,74 and Standard Deviation 1,86.

### 6.1.2 The calculation of carbon footprint within organizations

Based on the results, 19 of 93 respondents announce that in their organizations it is possible to calculate the carbon footprint originating from business traveling. Additionally, 27 managers indicate it is partly possible. This means that according to 49, 4 % of the managers, it is possible to calculate the footprint as whole or partly. Due to the nature of the statement, it is not relevant to use the Mean or Standard Deviation in this context. The graph is presented below (figure 9).

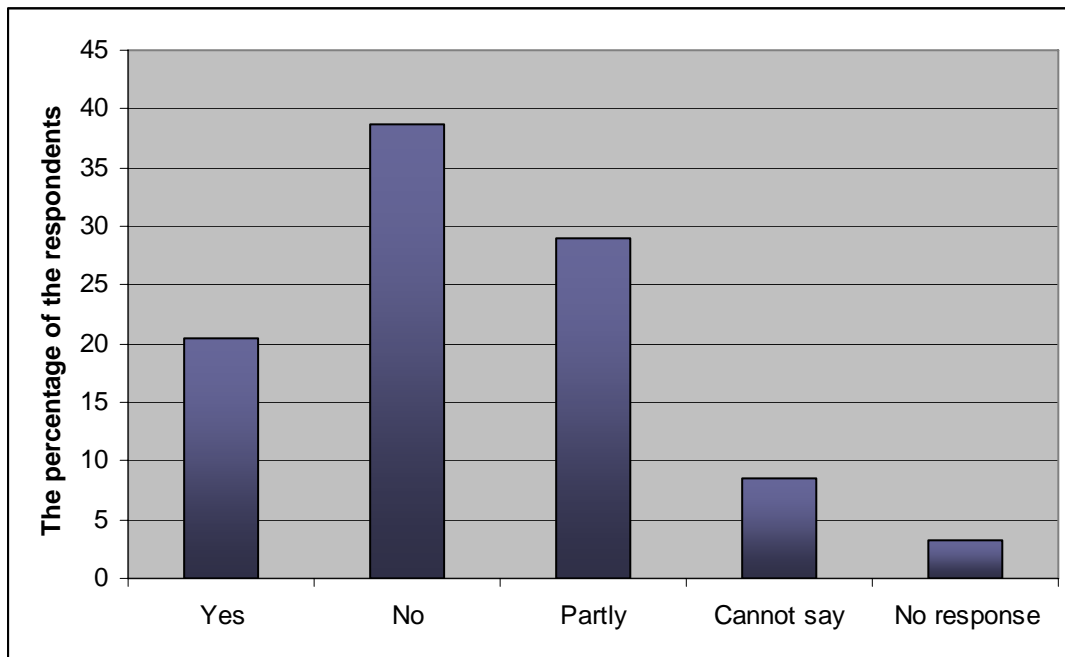


FIGURE 9. The possibility to calculate the carbon footprint caused by business traveling

For the statement “if possible, our organization would be interested in calculating the carbon footprint caused by business traveling”, 69 managers of the 93 totally or partly agree. In percentage this amount equals 74, 2%. The Mean of this statement among the respondents was 2,1 and Standard Deviation 1,2.

### 6.1.3 Acknowledging carbon footprint in business traveling

When asked whether or not the organization should take the carbon footprint into account when planning business traveling, 74 respondents from the total 93 either fully agree or partly agree with the statement. This amount in percentage equals 80. The Mean in this context is 2 and Standard Deviation 1.

For the statement “our organization should compensate the carbon footprint caused by business traveling”, 42 of 92 agreed. When announced in percents, the amount is 45. The Mean is 2,97 and Standard Deviation 1,39. The percentage of the respondents can be seen in figure 10 in the following. 27% of the respondents had not formed or could not say their opinion. This aforementioned percentage in this attitude based statement is larger than in the other statements (Figure 10).

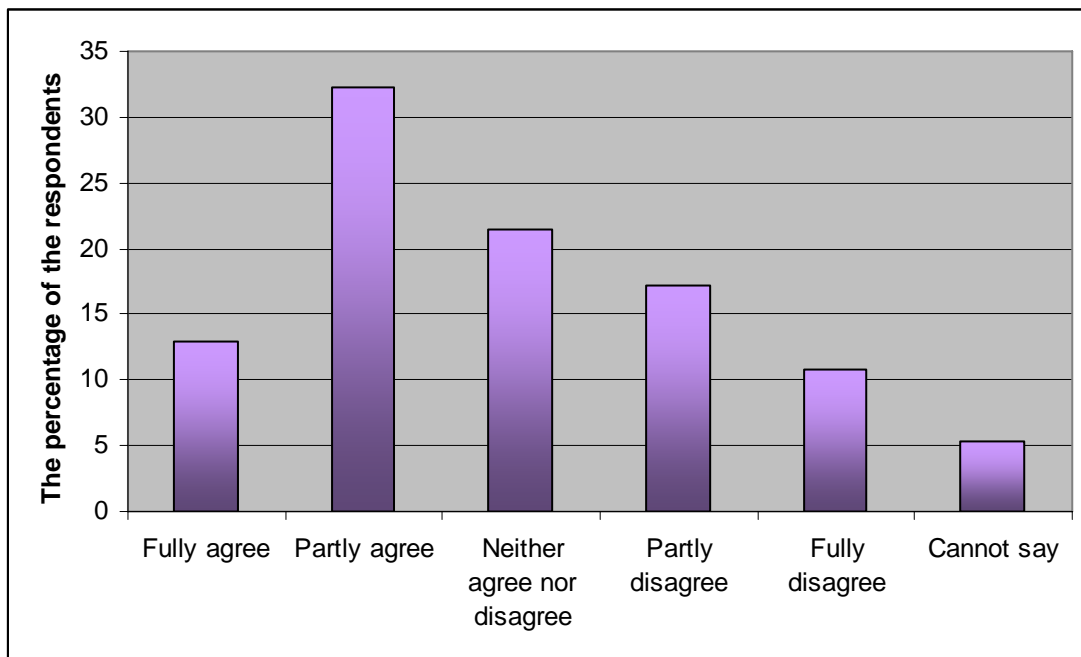


FIGURE 10. Our organization should compensate the carbon footprint caused by business traveling

#### **6.1.4 Decreasing costs and the carbon footprint by decreasing business traveling**

For the statements “our organization should decrease the costs by decreasing business traveling” there were 64 managers of the total 93 who either totally or partly agreed. The percentage equaled 69%, the Mean 2,37 and the Standard Deviation 1,24.

When the question indicated “Our organization should decrease the carbon footprint by decreasing business traveling”, 57 respondents of 93 either totally or partly agreed the statement. This amount is 61% while the Mean being 2,49 and Standard Deviation 1,16. There were no single respondent who would have given an opinion “cannot say”.

#### **6.1.5 The minimizing of the carbon footprint caused by business traveling within companies**

For the statement “our organization should seek alternative means in order to decrease the carbon footprint caused by business traveling”, 75 managers either fully agreed or partly agreed (See figure 11). For this statement the mean is 1,91 and standard deviation 1,01. The percentage of the respondents can be viewed in the following figure (see figure 11). None of the respondents totally disagreed with the statement.

73 respondents of the 93 agreed with the statement “I am personally interested in decreasing the carbon footprint of our organization’s business traveling”. The high amount transformed into percents is 79. The Mean here is 1,94 while Standard Deviation being 1,04.

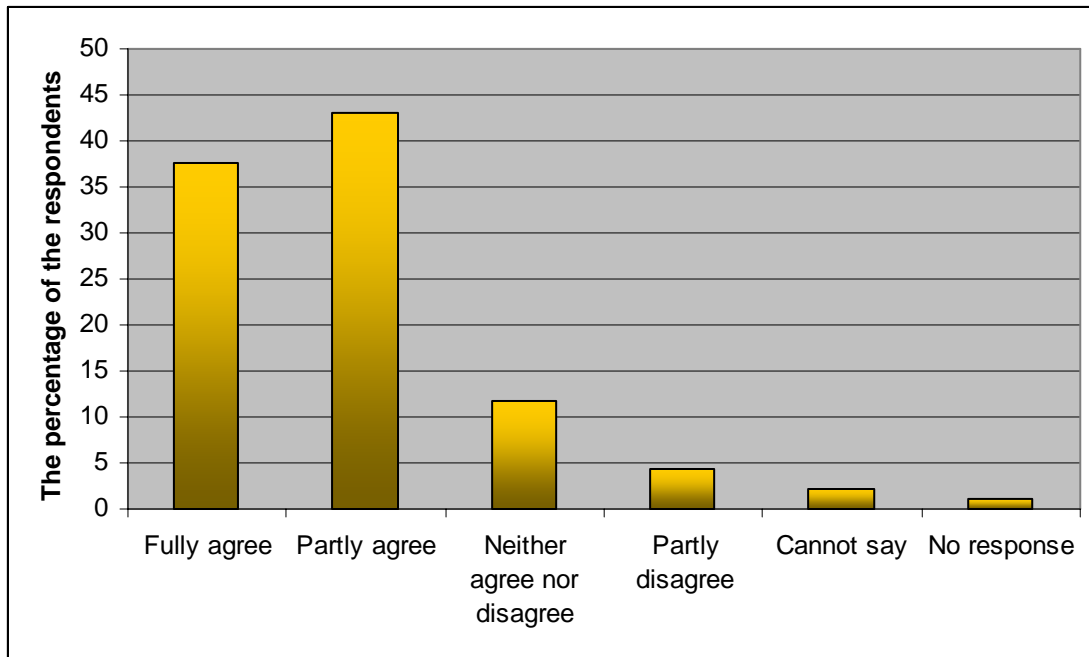


FIGURE 11. Our organization should seek alternative means in order to decrease the carbon footprint caused by business traveling

### 6.1.6 A summary of the presented data

The questionnaires were returned almost fully answered and for those questions which measured the managers attitudes there only two statements where the answer was left out; Our organization should seek alternative means in order to decrease the carbon footprint caused by business traveling and Our organization should take the carbon footprint into account when planning business traveling. It can be argued that the questions were understood clearly and they were easy to answer. One aspect that should be mentioned is that for the question about the relation of the carbon footprint of business traveling in comparison to the overall footprint of the organization, there were the most “cannot say” answers, 18%. In the attitude-based questions the percentage for “cannot say” answers was much lower than in this aforementioned information based question.

The lowest Mean was indicated in the question “our organization should seek alternative means in order to decrease the carbon footprint of business traveling”, 1,91. The highest Mean was discovered in the statement “our organization should compensate the carbon footprint caused by business traveling”. As mentioned in the other parts of this thesis, the possibility of the managers not having the required

information about the matter and this affecting their opinion is very high. Therefore the answers were divided within the range of 1-6 and the Mean was 2,97.

The lowest Standard Deviation in the attitude-based question is in the same statement than in the previous paragraph; “our organization should seek alternative means in order to decrease the carbon footprint of business traveling”, 1,01. This indicates that for this question the most respondents had answered in a similar way. The most division in the managers’ responses in the attitude-based questions were to be found in the statement “Our organization should compensate the carbon footprint caused by business traveling”, Standard Deviation being 1,39.

As a result it can be noticed that based on the managers’ statements, business traveling has increased in most of the companies. Many people responsible for the environmental and travel management have not yet formed a clear opinion about the compensation of the carbon footprint. The managers who were to be researched were interested in calculating the carbon footprint and the footprint should also be taken into account while planning business traveling. The weight should also be put on the fact that the respondents were keen on decreasing and finding alternative means in order to decrease the carbon footprint of business traveling.

## ***6.2 Analyzing data***

### **6.2.1 The amount of business traveling and the carbon footprint in companies**

The managers’ responses indicate that in most companies business traveling has increased within the last five years. However, especially in the field of chemistry and plastic, metal and construction based on the respondents business traveling has grown the most. As for the amount of business traveling, 74% of the female respondents believed business traveling had increased within the last five years, while the percentage among the male was 61 (see figure 12). Whether business traveling has increased within the last five years, more people responsible for travel management believed in their organization business traveling had increased. The

percentages between the travel management and environmental management were 81% and 60%, respectively. This can be due to the fact that the people responsible of travel management might have more data and knowledge about the amount of business traveling than those responsible of environmental issues. Analyzing the data with cross tabulations the amount of employees, education, age had no influence in general.

	Area of responsibility			for	Did say	not	Total
	Environmental Management	Travel Management	Responsible both				
Increased	13	15	0		0		28
++	16	19	1		0		36
+++	7	6	0		1		14
+++	5	2	0		0		7
Decreased	3	0	0		1		4
Cannot say	4	0	0		0		4
Total	48	42	1		2		93

FIGURE 12. The amount of business traveling within the last five years

For the statement which discusses the amount of carbon footprint of business traveling in relation to the total footprint of the organization, none of the respondents stated that the carbon footprint of business traveling in relation to the total footprint had been large. Instead, in most companies it was small. 71% of the people responsible of the environmental issues had stated the size of the carbon footprint is small in comparison to the overall footprint while in the case of people responsible for travel management the percentage was 43 (figure 13). This difference can be analyzed by arguing that people responsible for the environmental issues have more detailed information about the product's and production's environmental impacts, and thus they are aware that often the footprint deriving from business traveling is smaller than the footprint of the production or products. The answers based on different age, education, turnover, the line of business, sex, the amount of employees had no influence in general.



	Area of responsibility				Total
	Environmental management	Travel management	Responsible for both	Did not say	
Small	23	10	1	0	34
+	11	8	0	0	19
++	3	9	0	2	14
+++	3	3	0	0	6
Large	2	1	0	0	3
Cannot say	6	11	0	0	17
Total	48	42	1	2	93

FIGURE 13. Carbon footprints caused by business traveling in comparison to companies' overall carbon footprint

### 6.2.2 The calculation of carbon footprint within organizations

Based on the results, more people responsible of the environmental issues than responsible for travel management announce that in their organizations it is possible to calculate the carbon footprint of business traveling totally or at least partly. The percentage of the people responsible for the environmental issues is 61 and 44 for the travel managers. As for the line of business, transportation and logistics was the only field in which every respondent had stated it is possible either totally or partly to calculate the footprint. In the field of retail business the answers were the most negative, 83% of the respondents cannot calculate the footprint. In the companies where the turnover falls below 500 million Euros, as many as 81% of the respondents state in their companies it is not possible to calculate the footprint. Among the largest companies, in those where the turnover exceeds 3 billion Euros, 82% of the managers argue it is possible to calculate the footprint in their organizations (figure 14). Viewing the amount of employees in different organizations, it can be seen that in the respondents who work in largest organizations, claim more often that it is possible to calculate the footprint than those who work in the smallest companies. The companies who employ below 7000 people the percentage is 48 and those which employ more than 11000, the percentage is 80. Age, education, sex had no influence in general in this context.

	300 - 350 ME	350 - 400 ME	400 - 450 ME	450 - 500 ME	1500 - 1800 ME	1800 - 3000 ME	3000 – 5500 ME	5500 - ME
Yes	0	0	1	0	1	0	3	4
No	8	4	4	1	3	2	1	2
Partly	1	2	0	0	2	1	4	3
Cannot say	0	0	0	0	3	0	0	0
Total	9	6	5	1	9	3	8	9

FIGURE 14. The possibility to calculate the carbon footprint caused by business traveling

For the statement “if possible our organization would be interested in calculating the carbon footprint of business traveling”, 44% of the respondents responsible for the environmental management fully agreed with the statement, whereas the case among travel managers was 29%, thus a slight difference among the attitudes in terms of area of responsibility. The respondents in the field of transportation and logistics, groceries and metal industry seem to relate the most positively with the statement. 83% of the field of transportation and logistics, 75% of the respondents in the field of groceries and 75% of the respondents from the field of metal industry either fully or partly agree with the statement. Of those managers who work in the companies whose turnover exceeds 1500 million Euros, 94% either fully agree or partly agree with the statement. Thus they seem to have answered more positively for the statement than those others. When compared the amount of employees, those who work in the larger companies with the amount of employees more than 9000, the percentage of respondents who either totally agree or partly agree is completely the same (figure 15). Age, education, sex had no influence on the answers in general in this context.

	0- 1000	1001- 3000	3001- 5000	5001- 7000	7001- 9000	9001- 11000	11001- 20000	over 20000
Fully Agree	4	3	6	2	4	1	6	6
Partly Agree	7	11	7	2	1	1	1	3
Neither Agree Nor Disagree	3	2	2	1	2	0	0	0
Partly Disagree	0	6	1	1	0	0	0	0
Fully Disagree	0	0	0	1	0	0	0	0
Cannot say	1	1	0	0	0	0	1	0
Total	15	23	16	7	7	2	8	9

FIGURE 15. If possible, our organization would be interested in calculating the carbon footprint caused by business traveling

### 6.2.3 Acknowledging the carbon footprint in business traveling

After cross-tabulating the elements it can be acknowledged that the managers who work in the field of retail business 100% totally agree with the statement “our organization should take the carbon footprint into account when planning business traveling”. In chemistry and plastic, 83% either totally or party agree with the aforementioned statement. The percentage is precisely the same in transport and logistics. Grocery field the figure is 75 and in construction field, 71% of the managers either totally or party agree with the statement (see figure 16). These aforementioned lines of businesses related most positively to taking the carbon footprint into account when planning business traveling. Age, education, sex, area of responsibility, turnover and the amount of employees in the organization had no relevant influence, all of them related equally positively to the statement.

	Chemistry and Plastic	Construction	Transportation and Logistics	Grocery	Retail	Total
Fully Agr.	2	1	4	1	0	28
Partly Agr.	3	4	1	5	6	46
Neither Agr. Nor Disagr.	1	1	1	1	0	11
Partly Disagr.	0	0	0	0	0	4
Fully Disagr.	0	0	0	1	0	1
Cannot say	0	1	0	0	0	2
Total	6	7	6	8	6	92

FIGURE 16. Our organization should take the carbon footprint into account when planning business traveling

The compensation of the carbon footprint in business traveling divided the opinions among the organizations. As it can be seen from the appendices, the mean and standard deviation varied greatly. Based on this it can be understood that most respondents had not formed their opinion yet. It seems that those managers who have been born between the years 1974-1985 seem to be more willing to compensate the carbon footprints than older managers (figure 17). The percentage among the younger respondents was 64 while in the other’s case around 40. The managers operating in construction field were the most eager in compensating the carbon footprint, 71% being the amount of those willing to either totally or partly compensate the footprint. Those working in metal industry were the most unsure about their opinions and 31% neither disagreed nor agreed. It was impossible to

discover any relevant differences based on education, sex, area of responsibility, turnover or the amount of employees in the organizations.

	Unkno wn	Year of Birth							Total
		1985- 1980	1979- 1974	1973- 1969	1968- 1963	1962- 1957	1956- 1951	1950- 1945	
Fully Agr.	0	1	2	2	2	2	2	1	12
Partly Agr.	1	2	2	4	4	9	6	1	29
Neither Agr. Nor Disagr.	1	0	4	2	4	4	1	4	20
Partly Disagr.	0	0	0	3	1	6	3	3	16
Fully Disagr.	1	0	0	0	3	1	3	1	9
Cannot say	0	0	0	2	1	1	1	0	5
Total	3	3	8	13	15	23	16	10	91

FIGURE 17. Our organization should compensate the carbon footprint caused by business traveling

#### 6.2.4 Decreasing costs and the carbon footprint by decreasing business traveling

Those respondents born between the years 1951-1962 stated the most positive attitudes for the statement “our organization should decrease costs by decreasing business traveling”. As for the education, the respondents who possess the master’s education of business administration are more eager to decrease costs by decreasing business traveling. 88% of those respondents either totally or partly agree with the statement (figure 18). The managers who work in the field of grocery and chemistry and plastic seem to relate the most positively to decreasing costs by decreasing business traveling. The percentages are 88 and 83 respectively. The managers who work in the organizations which turnover exceeds 1800 million Euros 81% relate more positively than average. When the amount of employees within different companies are compared, of the managers who work in the organizations that employ less than 7000 people, 62% relate positively towards the statement. Of those who work in the organizations that employ more than 7000, 81% relate positively. The difference in percentage is significant. Sex and the area of responsibility did not have influence on the respondents’ attitudes in general.

	MBA	M.Sc. in Technology	BBA	Engineer	VQBA	Other relevant academic	Did not say	Vocati onal	Total
Fully Agr.	5	3	1	1	3	3	2	3	21
Partly Agr.	10	8	1	4	2	5	3	8	43
Neither Agr. Nor Disagr.	1	3	0	0	3	3	2	0	12
Partly Disagr.	1	2	0	1	0	1	1	2	9
Fully Disagr.	0	1	0	2	0	2	1	0	6
Cannot say	0	1	0	0	0	0	1	0	2
Total	17	18	2	8	8	14	10	13	93

FIGURE 18. Our organization should decrease the costs by decreasing business traveling

As for decreasing the carbon footprint by decreasing business traveling, age is the first driver that makes the difference in the attitudes. The young people seem to relate more positively with the statement, of the people born 1974-1985, 81% either totally or partly agree with the statement. When it comes to the education, the respondents who possess the master's degree in business administration relate the most positively to decreasing the carbon footprint by decreasing business traveling, the percentage being 88%. The people with the degree of general vocation level follow behind with the percentage of 77% and the respondents of Vocational Qualification in Business and Administration equal 75%. The female seem to relate more positively in decreasing the carbon footprint by decreasing business traveling, with the percentage of 70% in comparison to 48% of the male (figure 19). Of the people responsible of the environmental issues 54% relate positively with the statement whereas the percentage among the people responsible of travel management was 69%. Managers who represent the field of chemistry and plastic (83%) and construction (86%) represent the most positive attitudes in this context. Turnover seems to have difference when comparing the answers, since of the people who work in the organizations with the turnover exceeding 1800 million Euros, 81% either totally or partly agree. The percentage (76%) is also higher than average (61%) when comparing the answers from the respondents who work with different sized companies in terms of the amount of employees.

	Sex			Total
	Male	Female	Did not say	
Fully Agr.	7	9	1	17
Partly Agr.	8	29	3	40
Neither Agr. Nor Disagr.	5	8	2	15
Partly Disagr.	7	7	1	15
Fully Disagr.	4	1	1	6
Total	31	54	8	93

FIGURE 19. Our organization should decrease the costs by decreasing business traveling

### 6.2.5 The minimizing of the carbon footprint caused by business traveling within companies

In general, it can be argued that the managers responsible for the environmental and travel management would be very interested in finding alternative means to minimize the carbon footprint that is created by the organization's business traveling. None of the respondents totally disagreed with the statement "our organization should find alternatives means in order to decrease the carbon footprint of business traveling. The female respondents seem to relate more positively with finding alternative means than the male since 44% fully agreed with the statement whereas the percentage of the male was 27%. In terms of lines of businesses, the managers from the field of transportation and logistics, metal and chemistry and plastic seemed to relate more positively with the statement. In transportation and logistics, all the respondents either totally or partly agreed with the statement, in metal the percentage was 88% and in chemistry and plastic 83%. The managers who are employed by the companies with turnover less than 500 million Euros, 62% either totally or partly agreed with the statement whether their organization should find alternative means in order to decrease the carbon footprint of business traveling. This percentage is 20% more negative than the average percentage of the respondents (figure 20). Age, education, area of responsibility and the amount of employees did not have influence for the responses in this context.

	300 – 350 ME	350 - 400 ME	400 - 450 ME	450 - 500 ME	Total
Fully Agree	2	2	1	0	35
Partly Agree	5	3	2	1	40
Neither Agree Nor Disagree	2	1	1	0	11
Partly Disagree	0	0	0	0	4
Cannot say	0	0	1	0	2
Total	9	6	5	1	92

FIGURE 20. Our organization should seek alternative means in order to decrease the carbon footprint caused by business traveling

When asked personal attitudes towards decreasing the organization's carbon footprint, managers from the fields of chemistry and plastic, metal and transportation and logistics were the most eager to decrease the footprint. The percentage of chemistry and plastic was 100%, transportation and logistics 100% and metal 88% (see figure 21). Clearly, it can be demonstrated that those managers who work in largest organizations whose turnover exceeds 1800 million Euros, 68% of the respondents totally agree with the statement. The average percentage of all the respondents who totally agreed was 39%. The same about the managers' attitudes can be said when compared to the amount of the employees within an organization; those relate more positively who work in large organizations. As for the age, sex, education, area of responsibility, there was no influence on those for the overall attitudes.

	Chemistry and Plastic	Metal	Transportation and Logistics	Total
Fully Agr.	2	8	3	36
Partly Agr.	4	6	3	37
Neither Agr. Nor Disagr.	0	2	0	15
Partly Disagr.	0	0	0	2
Fully Disagr.	0	0	0	1
Cannot say	0	0	0	2
Total	6	16	6	93

FIGURE 21. I am personally interested in decreasing the carbon footprint of our organization's business traveling

## 6.2.6 The summary of the analyzed data

After the Likert scale statements of the data were analyzed by computing the sums of the variables. This was accomplished by recoding the alternatives of the statements by excluding the alternative “cannot say”. Thus, the researchers were able to obtain information of those respondents whose attitudes mattered. Eventually, the data was analyzed and compared with Cronbach’s alpha. Nunnally & Bernstein (1994) clarify in Metsämuuronen (2005, 515) that the alpha value 0,60 would be the lowest acceptable when it comes to the relevance. In the case of this research the Cronbach’s alpha was 0,780 and the alpha based on standardized items 0,798, as seen in figure 22. Thus on Cronbach’s alpha the data of the research can be seen as reliable.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,780	,798	7

FIGURE 22. Cronbach’s alpha figures

The fact that the Cronbach’s alpha would not change radically (see figure 23) even if any one of the statements would be removed, should be notified as well when the reliability is investigated.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
If possible, our organization....	23,0120	15,914	,561	,533	,742
I am personally interested in decreasing..	22,8675	16,677	,584	,626	,743
Our organization should decrease costs by....	23,3855	16,508	,352	,475	,787
Our organization should take the carbon footprint into account...	22,9639	17,377	,464	,234	,761
Our organization should seek alternative means..	22,8193	16,296	,633	,659	,734
Our organization should compensate...	23,7952	15,189	,460	,311	,766
Our organization should decrease the carbon...	23,5181	14,301	,599	,564	,732

FIGURE 23. Variables if items deleted



Metsämuuronen (2005) indicates the correlation factors can have numbers between -1-1. The closer the factor is to zero the less there is relationship between arguments. When the correlation factor equals between 0.8-1.0 it can be acknowledged very high. Factors between 0.6-0.8 and 0.6-0.4 can be considered high and relatively high, respectively. (Metsämuuronen 2005, 345-346.)

As it can be seen in the figure 24, high correlation is established in three different cases. The statements “our organization should seek alternative means in order to decrease the carbon footprint of business traveling” and “I am personally interested in decreasing the carbon footprint of the organization’s business traveling” (0,752), “Our organization should decrease the carbon footprint of business traveling” and “Our organization should decrease costs by decreasing business traveling” (0.649) and “If possible, our organization would be interested in calculating the carbon footprint of business traveling” and “Our organization should seek alternative means in order to decrease the carbon footprint of business traveling” (0.639) equaled high correlation.

A low correlation was found in the following statements; “Our organization should decrease costs by decreasing business traveling” and “I am personally interested in decreasing the carbon footprint of the organization’s business traveling” (0.044), “Our organization should decrease costs by decreasing business traveling” and “If possible, our organization would be interested in calculating the carbon footprint of business traveling” (0.082), “Our organization should decrease costs by decreasing business traveling” and “Our organization should seek alternative means in order to decrease the carbon footprint of business traveling” (0.166).

	If possible, our organization	I am personally interested	Our organization should decrease	Our organization should take	Our organization should seek	Our organization should compensate	Our organization should decrease
If possible, our organization I am personally interested	<b>1,000</b>	,591	,082	,352	,639	,484	,248
I am personally interested	,591	<b>1,000</b>	,044	,401	,752	,339	,371
Our organization should decrease	,082	,044	<b>1,000</b>	,212	,166	,203	,649
Our organization should take	,352	,401	,212	<b>1,000</b>	,423	,264	,322
Our organization should seek	,639	,752	,166	,423	<b>1,000</b>	,282	,412
Our organization should compensate	,484	,339	,203	,264	,282	<b>1,000</b>	,339
Our organization should decrease	,248	,371	,649	,322	,412	,339	<b>1,000</b>

FIGURE 24. Correlation between the statements

Based on the cross-tabulations, it can be demonstrated that in some cases the different variables i.e. age, sex, education, area of responsibility, line of business, turnover, and the amount of employees had influence on the answers. In terms of turnover and the amount of employees, it can be stated that those managers who work in the larger companies had more positive answers for several different statements, as it can be seen in the previous paragraphs. The managers who are employed by certain lines of business seemed to have more positive attitude towards the statements. These lines of businesses were for example chemistry and plastic, metal field and transportation and logistics. When it comes to the education of the managers, in some statements there were certain differences and especially the managers who possessed the master's degree in business administration related more positively to decreasing costs by decreasing business traveling. Also the age seems to be relevant variable in this aforementioned statement since the young seem to have more positive attitudes.

Differences were to be found based on the areas of responsibility. The people responsible for the environmental management seemed to have stated the size of the carbon footprint originating from business traveling in terms of the overall footprint of the organization smaller than the people responsible for travel management. This is most likely due to the fact that the environmental managers are more aware of the product and production-oriented factors and thus acknowledge the fact that business traveling does not make a large contribution in terms of the overall footprint. The people responsible for travel management seem to argue more than the environmental managers that the amount of business traveling has increased within the five years. This can be explained similarly than in the previous statement; travel managers are more aware of their own area of responsibility which is business traveling, than environmental managers.

There is also difference between sexes in the answers. It can be argued that the female seem to have more positive attitudes towards some elements than the male. These elements include the possibility of the organizations to seek alternative means in order to decrease the carbon footprint caused by business traveling and the possibility of decreasing the carbon footprint by decreasing business traveling.

When the percentage differences were analyzed by using the T-test, it was possible to notice that there were no significant differences in the Means of the statements. Even though for certain statements there were some group of variables (e.g. sex, area of responsibility) that indicated more positive opinions, a few answers indicating “cannot say” or “neither agree nor disagree” eventually affected to the whole group’s Mean and Standard deviation in the statement. Hence according to the T-test no significant differences were found in the Mean and Standard deviation.

## **7. DISCUSSION**

### ***7.1 The reliability of the research***

It is very difficult to estimate how much these attitudes can be generalized in the entire culture and the rest of the management. When investigating the results it is important to put the weight on the fact that this research studied the attitudes of people, not companies. In addition, one could question, which factors have lead the management to answer this positively and does the fact that the attitudes were positive, reflect the prevailing reality in the companies' operations.

In this synthesis the researchers did not focus on investigating heavy generalizations between certain lines of businesses and the size of the organization; should the both have been taken into account in cross-tabulations, the small amount of responses would have made the generalizations impossible. The same aspect applies for certain other statements due to the fact that not having a decent amount of answers will affect the reliability of the outcome.

As it has been demonstrated by different authors in the earlier parts of this thesis, attitudes and the reliability of stated attitudes can be difficult to measure. Probably one common factor why people tend to indicate a positive attitude is the peer pressure and because they are expected to do so. This element should be taken into account when actions are later executed based on researched attitudes. What was also rather surprising was the fact that there were no significant differences in the responses among the environmental managers and travel managers. This can be explained by having a look at the questions, as they were to study attitudes instead of factual information. This means that every respondent may have a certain opinion or an attitude towards something and it does not require deeper understanding about an issue in order to form an opinion. The focus was to study attitudes towards the carbon footprint of business traveling and it can be assumed that a person whether he or she, young or old, travel manager or environmental manager has an opinion and a certain reason to indicate that.

When it comes to the response rate of this survey, of the total 150 biggest companies 51 % answered. If this percentage is compared to the previous studies related to the topic (see chapter 5,2), it can be noticed that the response rates bear resemblance. The reliability of this research thus is in the same line in terms of validity as previous studies.

One issue that has arisen during the whole research is the issue that companies do not have attitudes, but they belong to persons. Thus the managers who have stated their opinions do represent themselves in the issue, instead of the whole management or an organization. One aspect to consider is the reason behind employing a certain person to a certain position for the organization. The function of a travel manager or environmental manager might be regarded to represent and manage the issues in travel field and environmental field, respectively, at least in some level.

An interesting issue is the environmental attitudes related to traveling in a sense that according to the Nordic Business Travel Barometer (2007) 82 % of the Finnish respondents claim the ongoing discussion about climate change will not increase their travel by train (The Nordic Business Travel Barometer 2007). However, the results of this research about the management attitudes towards the carbon footprint of business traveling show that altogether approximately 80 % of the respondents in some level would like to find alternative means in order to decrease the carbon footprint of their business traveling (see appendix 4). As stated before in this chapter, very few are not willing to find alternative means in order to minimize the carbon footprint. However, it should be stated that as demonstrated in the Attitudes –chapter in this synthesis, people tend to indicate positive attitude but that does not prove they will execute the sort of behaviour. The results vary a lot and whether the people are willing to do concrete actions is a different story and requires a different sort of investigation.

As for the different evaluations and estimation in the different percentage of carbon footprint researches during the years, one explaining factor is that the information taken for this synthesis varies among ten years or so. It is not surprising that for example in the between of, or the late 90's, the percentage of CO2 emissions

deriving from aviation might have occurred in literature as 2-3 % and for example in 2007 it could be 3,5-4 %. According to WWF a return flight between Finland and Thailand will create 2500 kg of CO<sub>2</sub>; whereas according to Finnair the amount is 1200 kg (Helsingin Sanomat 2008). What is interesting is the rapid increase in CO<sub>2</sub> emission percentage within such a short period of time due to increased aviation. A highly profound report related to aviation's role in climate change can be found from Intergovernmental Panel of Climate Change website. (IPCC.)

## ***7.2 Evaluation of the gap between the research questions and the results***

As stated before, the objectives of this research were to analyze what are management attitudes of 150 biggest Finnish organizations towards the carbon footprint of business traveling. Sub-questions deal with issues such as whether there are differences in the attitudes between the environmental and travel managers? Will the attitudes differ in different lines of businesses e.g. energy production vs. metal industry? Will the attitudes differ according to turnover and to the amount of employees within companies? Are there differences in the answers in terms of education of the respondents?

The researchers feel that the primary research question has been answered thoroughly in the empirical part of the synthesis. The research succeeded in producing information for the sub-questions, and it was possible to notice that different variables such as the turnover and the amount of employees in the organizations had impact towards the attitudes. A lot of information had been gathered about the management attitudes, and by utilizing the information it had been possible to establish conclusions about the reasons and behaviour beyond. To conclude, the research was successful in terms of what the objectives were in beforehand.

## **7.3 The management attitudes**

### **7.3.1 The reflection of management attitudes on behavior**

Some parts of the theoretical framework of this thesis concentrated on the attitudes' affection on behavior. However, it is impossible to clarify whether the models and theories can be reflected straight to this research since the behavior of the management has not been studied yet since the focus in here were the attitudes instead of behavior. In addition, it would be impossible to study behavior in this sort of quantitative study.

Based on the previous theoretical models it seems that theory of reasoned action (Ajzen & Fishbein) and theory of planned behavior (Ajzen) would be the most supportive basis for investigating management attitudes towards the carbon footprint of business traveling due to the fact that they both include the idea that an individual's norm is affected by an external factors such as peer pressure. It can be argued that management in this study in some level operates in a certain way due to external (stakeholder) demands. Based on the results, in the largest organizations the management had more positive attitudes towards the decrease of carbon footprint. This can be possible due to the fact that the largest organizations face more stakeholder pressures and thus it affects on management thinking in a certain way.

Even though the researches have not tested the models in the field due to the fact that it was not part of the research question and had required a different sort of study altogether, it is acknowledgeable that the management in the largest organizations seem to operate based on the theory of planned behavior and theory of reasoned action. The both models include the factors where an individual is affected by an external impact i.e. the person believes that specific individuals or groups think he should or should not perform the behavior and his motivation to comply with the specific referents.

The weight can be put to the probability that in the largest companies the management attitudes and behavior are affected by an external pressure arising from

different stakeholders. The largest companies in their businesses need to consider different stakeholders and especially organizations' environmental policy is largely affected by ENGO's (environmental non-governmental organization) and other pressure groups. Thus it is important for the organizations to operate in a way which is agreeable in terms of stakeholders.

#### ***7.4 Environmentally Responsible Corporate Travel Policy***

During the process of this research the researchers have come up with an idea of establishing a Model of Environmentally Responsible Corporate Travel Policy, which focuses on decreasing the environmental impacts of business traveling such as the carbon footprint. Even though there are managers responsible for the environmental aspects and impacts of the top 150 biggest Finnish organizations, the weight is put often to acknowledging product and production related environmental aspects instead of taking business traveling into account.

The Model of Environmentally Responsible Corporate Travel Policy includes seven phases with the help of which the organizations may estimate and calculate the environmental aspects and impacts of their business traveling and later on decrease them. As well as the Environmental Management Systems (EMS), this model is also based on the principle of continuous improvement.



### **7.4.1 The Model for Environmentally Responsible Corporate Travel Policy**

The first phase of implementing a Model for Environmentally Responsible Corporate Travel Policy (MERCTP) is that also the organization's environmental manager or the person responsible for the environmental issues should participate in planning the process. The problem of business traveling from the point of view of environmental aspects is that often travel managers might not have enough information and knowledge about environment.

The second phase includes the implementing a system for organizations to calculate the environmental impacts of their business traveling, including the carbon footprint. Without the relevant data, it is impossible for the organizations to develop their performance into a more sustainable way.

In the third phase, the organization and the management evaluates the environmental aspects and impacts of business traveling and the division of them into significant and less significant. This can be achieved after the organization has calculated the emissions. After the significant environmental impacts have been identified the organization may focus on them.

The fourth phase is about setting targets for decreasing the environmental impacts of business traveling. The organization needs to determine the point of time for which the targets will be achieved. In setting the targets it is important to evaluate them in a realistic way i.e. the possibilities to reaching them.

After the targets have been set, along comes the fifth phase which function is to decrease the environmental impacts of business traveling. In practice, this can be done by using alternative ways of traveling which have less impact to the environment e.g. train and other mass transportation. Another way of decreasing the impacts is utilizing new technology. The new technology consists of replacing business traveling by video conferences and using more environmentally friendly vehicles in business traveling.

When the point of time mentioned in the phase three has passed, the sixth phase focuses on factors in which the travel manager and the environmental manager view the results together and compare them to the starting point. This moment determines whether the targets have been reached. If there are elements which have not been accomplished, the management should consider the reasons why this was the case.

The seventh phase considers the means for improving the processes as whole. The management discusses with the possibilities how to decrease the environmental impacts of business traveling of the current state. After the seventh phase has been reached, the process moves again towards the third phase which is the evaluation of the environmental aspects and impacts. This process formulates a circle of continuous improvement.

#### **7.4.2 The benefits of the Model of Environmentally Responsible Corporate Travel Policy**

By implementing the MERCTP, the organization may benefit in numerous ways. For example the improvements can be seen in the decrease of the carbon footprint caused by business traveling, decrease in costs and affecting on positive corporate image. The MERCTP can be used as a tool which helps in communication and dialogue with the stakeholders and it enables to indicate concretely which results have been achieved and how.

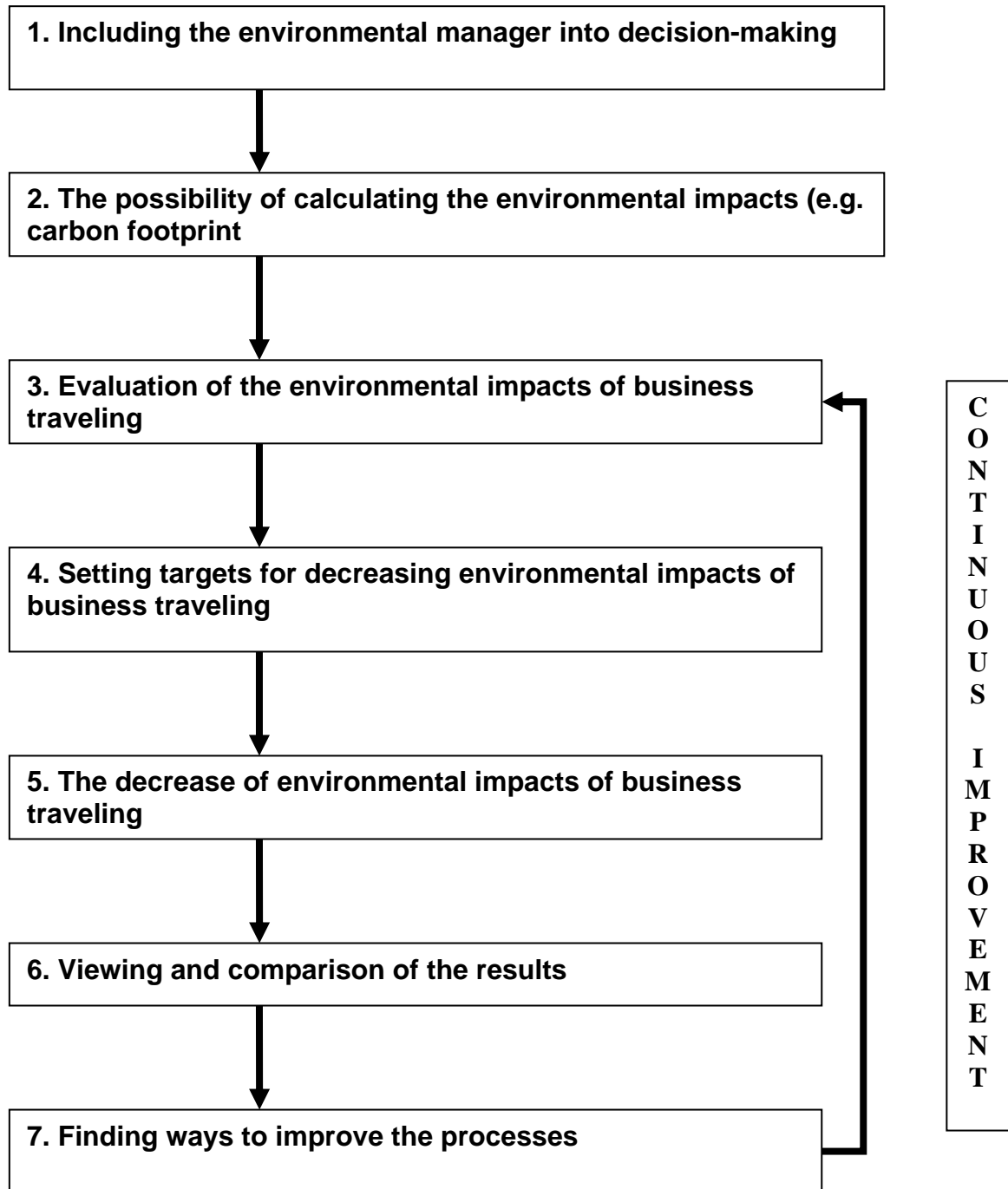


FIGURE 22. The Model of Environmentally Responsible Corporate Travel Policy

## ***7.5 Potential future research related to the subject***

As for the future, this synthesis provides ideas for additional investigation in relation to management attitudes. One approach could be to investigate the attitudes' relation to concrete behavior within organizations. Especially due to the fact that the management results were rather positive towards the decrease of the carbon footprint, it would be interesting to find out whether the positive attitudes lead to concrete actions in terms of decreasing the footprint after certain period of time.

One aspect of research would be to analyze the corporations' business travel policy. Current situation does not include environmental aspects but focuses merely on budgets and transportations. The future object could be to focus on how organizations integrate the environmental issues on their business travel policies.

This research has focused on researching the top 150 biggest Finnish organizations. However, one interesting factor would be to acknowledge how small and medium sized organizations management relate to the carbon footprint of business traveling or the managerial attitudes toward the carbon footprint in general. Another topic of interest would be to renew the research that has occurred in this synthesis; the management attitudes of the top 150 biggest Finnish companies towards the carbon footprint of business traveling in the year 2013.

## **8. CONCLUSIONS**

### ***8.1 General***

The analysis of the responses indicated positive attitudes towards different themes such as the interest for decreasing and calculating the carbon footprint and finding alternatives for current situation. Based on the answers of the people responsible of environmental and travel management, it can be acknowledged that business traveling has increased in most top 150 biggest Finnish companies within the last five years. This can also be seen by investigating the Nordic Business Travel Barometer 2007. In spite of the growth, the environmental and travel management would be eager to decrease business traveling in order this to decrease costs and the size of carbon footprint. The research reveals that the carbon footprint caused by business traveling is small in comparison to the companies' carbon footprint caused by other sources.

It is possible to observe, that mostly the companies' environmental and travel management have positive attitude and orientation in their opinions when it comes to carbon dioxide emissions and in personal level the management seems to be highly willing to decrease the size of the carbon footprint of business traveling. It has to be taken into account that the focus of this research was the attitudes, and not the behaviour of those aforementioned two different managements. It can be stated, that calculating the footprint is seen as rather important element in the companies due to the fact that half of the respondents state it is either fully possible or partly possible to calculate it. It is possible to argue that the general trend in the environmental thinking has influenced on the management attitudes positively that are investigated in this research. Thus the trigger for environmentally sound attitudes can be thought to derive from external factors i.e. stakeholders.

The management seems to be interested in acknowledging the carbon footprint deriving from business traveling and finding alternative means to cut them down. Those responsible in environmental and travel management in the companies

apparently are personally willing to cut down business traveling in order to cut down cost and decrease the size of the carbon footprint. One of the key elements why the management would like to decrease costs may be due to the fact that the expenses of aviation have been increasing lately. Cutting down business traveling is made possible by using video and audio conferences and other advanced technology. However, applying new technology will not entirely replace business traveling since in some occasions it is necessary to establish personal contacts (Denstadli 2004, 371-372).

In most cases, the possible compensation of the carbon dioxide emissions divided the management opinions in a way that approximately half of the respondents do not seem to have formed a clear opinion about the matter. This may be due to the fact that carbon offsetting is relatively new concept and thus part of the respondents does not have enough information to have been able to form an opinion. One potential reason boils down to the fact that there are several institutions that offer carbon offsetting related solutions and organizations wish to be sure to which organization to count on in order for the donation to reach its target. It is also possible that the organizations wait until different stakeholders have established certain opinions about the carbon offsetting before they themselves start executing actions. Carbon offsetting belongs to the field of demonstrating corporate social and corporate environmental responsibility. It is highly probable that if the different stakeholders e.g. customers, NGO's would start demanding the organizations to offset their footprint, the popularity of offsetting would increase within the organizations.

## ***8.2 The divergence between the management attitudes***

### **8.2.1 The management attitudes in the largest organizations**

Andrews (1998) described a commonly thought hypothesis that more environmentally friendly behavior is more likely to be presented among large organizations (Andrews 1998, 531). Our research demonstrates that there is point in this hypothesis at least in some terms, since the environmental and travel management in the biggest Finnish organizations in terms of turnover and the

amount of employees do tend to demonstrate more pro-environmental attitude in the possible compensation of carbon dioxide emissions caused by their organization's business traveling (see chapter 6.3), the possible calculation of the carbon footprint caused by their business traveling, and the interest towards decreasing the costs when decreasing the carbon footprint. It seems that in the largest Finnish organizations in terms of turnover, the corporate environmental responsibility seemed to be regarded at least in some level more important. This was also the case among many large companies in terms of the amount of employees. One of the most crucial reason for large companies behaving more environmentally sound way is likely due to the fact that they and their actions are more interested in by different stakeholders such as NGO's and media.

### **8.2.2 The divergence of the management attitudes between other different variables**

The results indicate that when the answers between the people responsible for environmental and travel management were compared, there were no significant differences between the attitudes, except the statements which investigated the amount of business traveling and the size of the carbon footprint of business traveling in comparison to the overall carbon footprint of the company. Hence the attitudes towards the carbon footprint between two management levels were much alike.

As for the differences in opinions between age and sexes, it can be concluded that the young and female managers relate a bit more positively decreasing the carbon footprint in the companies and as well to the possible compensation, than the rest of the respondents. Hamilton (1985) and Blocker & Eckberg (1989) review in Foster & McBeth (1994) that some literature suggests the female to possess more environmentally sound attitudes (Foster & McBeth 1994, 402). Thus similarities can be found between this research and the predecessors.

It can be noticed from the research that the management operating in the field of chemistry and plastic and metal industry answered most of the answers more positively than the rest of the management in the other fields of businesses. The reason can be argued to be the fact that the environmental impacts of these industries (chemistry and plastic and metal industry) is noticeably greater than other industries and thus stakeholder (e.g. customers, shareholders, NGO's) pressure obligates to indicate a positive image. For some reason the metal industry is a field of business or culture for which the calculation of carbon footprint not possible. However, the results indicate that the managers in metal industry relate very positively to calculating the footprint if that was made possible.



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Realbusiness.(<http://www.realbusiness.co.uk/business-focus/carbon-trust/4843551/27-waysto-cut-your-carbon-emissions.shtml>, 24.3.2008)

Talouselämä ([www.talouselama.fi/te500list.te](http://www.talouselama.fi/te500list.te), 31.3.2008)

The Finnish Business Travel Association (fbta.net, 10.1.2008)

Yleisradio. (<http://www.yle.fi/uutiset/ymparisto/oikea/id79529.html>, 10.1.2008))

# APPENDICES

## APPENDIX 1; Questionnaire

**Johdon mielipiteet liikematkustuksen ympäristövaikutuksiin**

**Yrityksen nimi**

**Vastaaja**

Ympäristöasioista vastaava johtaja  Matkahallinnosta vastaava johtaja

Syntymävuosi

Koulutus

---

**Liikematkustus**

	Pieni			Suuri	ei osaa sanoa	
Liikematkuksesta aiheutuvien hiilidioksidipäästöjen rooli suhteessa yrityksen muihin hiilidioksidipäästöihin on (Valitse vaihtoehto joka parhaiten kuvaa tilannetta)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Kasvanut		Pienentynyt		ei osaa sanoa	
Yrityksemme liikematkustus on viimeisen viiden vuoden aikana (Valitse vaihtoehto joka parhaiten kuvaa tilannetta)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Kyllä	ei osittain	ei osaa sanoa	
Onko yrityksellenne mahdollista mitata liikematkuksesta aiheutuvat hiilidioksidipäästöt?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	5 Täysin samaa mieltä	4 Osittain samaa mieltä	3 Ei samaa eikä eri mieltä	2 Osittain eri mieltä	1 Täysin eri mieltä	ei osaa sanoa
Mikäli olisi mahdollista, yrityksemme olisi kiinnostunut mittaamaan liikematkuksesta aiheutuvat hiilidioksidipäästöt?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Yrityksemme tulisi kompensoida liikematkuksesta aiheutuvia hiilidioksidipäästöjä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Yrityksemme tulisi ottaa hiilidioksidipäästöt huomioon liikematkustusta suunniteltaessa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Yrityksemme tulisi karsia kustannuksia vähentämällä liikematkustusta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Yrityksemme tulisi vähentää hiilidioksidipäästöjä liikematkustusta vähentämällä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Yrityksemme tulisi pyrkiä löytämään keinoja liikematkustuksen hiilijalanjäljen vähentämiseksi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Olen kiinnostunut vähentämään yrityksemme liikematkustuksen hiilijalanjälkeä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

## APPENDIX 2; Covering letter

Arvoisa vastaanottaja,

Jyväskylän Yliopiston yritysten ympäristöjohtamisen maisteriohjelmassa tutkitaan pro gradu-työnä 150 suurimman suomalaisen yrityksen ympäristöjohtoon ja matkahallinnosta vastaavan johdon asenteita liikematkustukseen liittyen. Vastaukset käsitellään anonyymisti ja yksittäiset vastaukset eivät erotu tutkimustuloksista.

Kysely lähetetään yritysten ympäristöasioista vastaaville johtajille sekä matkahallinnosta vastaaville johtajille. Palkinnoksi vastaamisestanne lähetämme teille tutkimuksen tulokset tammikuun aikana.

Kyselyyn vastaamiseen kuuluu liioittelematta vain kaksi minuuttia ja pääsette siihen suoraan alla olevasta linkistä. Tutkimuksen luotettavuuden takaamiseksi olisi äärimmäisen tärkeää, että vastaisitte kaikkiin kysymyksiin.

<https://korppi.jyu.fi/kotka/r.jsp?questionnaireid=2079>

Vastauksianne odotellen,

Juha Lindroos  
[Jukalind@cc.jyu.fi](mailto:Jukalind@cc.jyu.fi)

Tero Pakarinen  
[Teilpaka@cc.jyu.fi](mailto:Teilpaka@cc.jyu.fi)

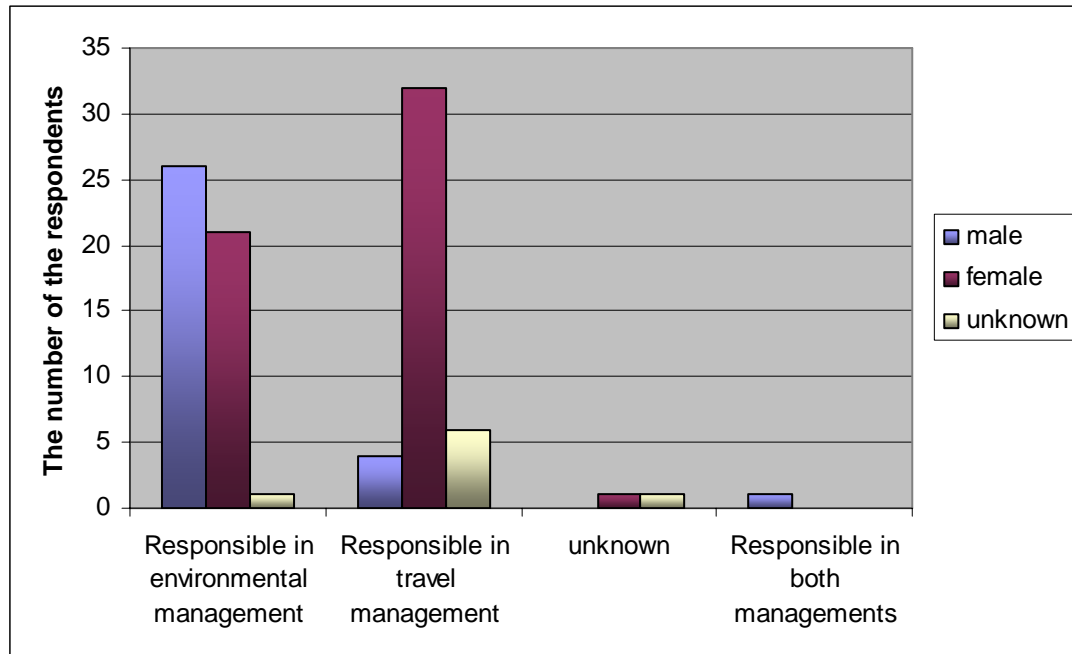


### APPENDIX 3; The list of Talouselämä's Top 150 companies

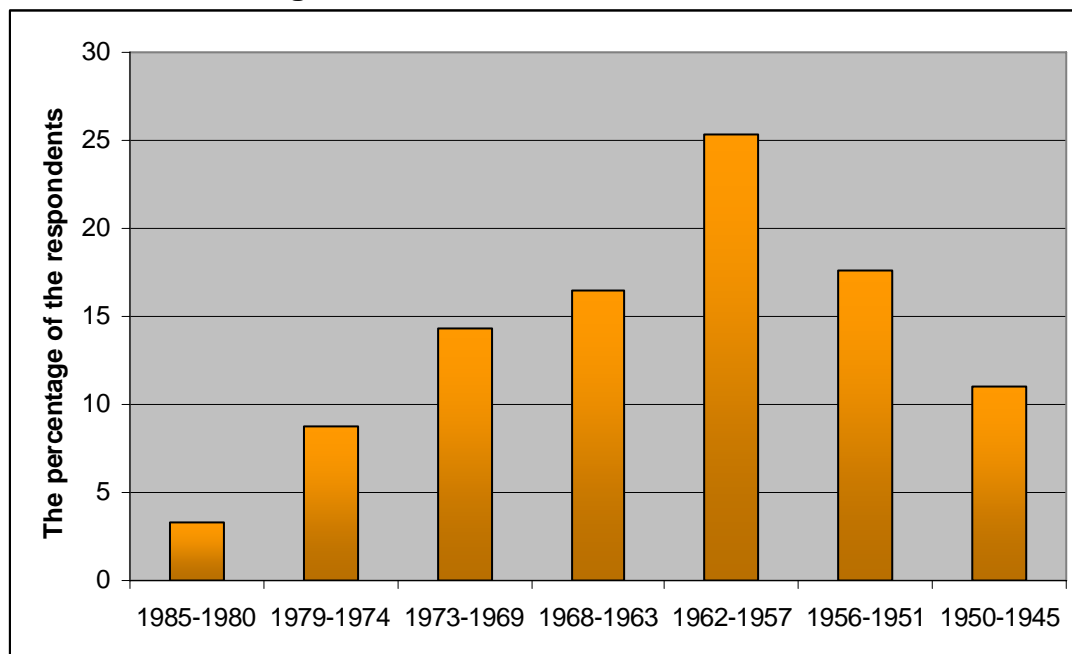
1. Nokia
2. Stora-Enso
3. Neste Oil
4. UMPKymmene
5. Metsäliitto
6. Kesko
7. Sampo
8. SOK
9. Outokumpu
10. Tamro
11. Metso
12. Nordea
13. Varma
14. Fortum
15. Ilmarinen
16. Elcoteq
17. Osuuspankkikeskus
18. Rautaruukki
19. Kone
20. YIT-Yhtymä
21. Wärtsilä
22. Sanoma WSOY
23. Luvata
24. Cargotec
25. Kemira
26. Huhtamäki
27. Finnair
28. RTF-Auto
29. Telia-Sonera Finland
30. Lemminkäinen
31. Amer-Sports
32. ABB
33. Nordea Henkivakuutus
34. Tieto-Enator
35. Valio
36. Onvest
37. Ahlström
38. Teboil
39. Suomen Posti-Itella
40. Myllykoski
41. Elisa
42. Eläke-Tapiola
43. Kone-Cranes
44. GNT-Holding
45. Wihuri
46. Veikkaus
47. Oriola KD
48. Tradeka
49. Stockmann
50. VR-yhtymä
51. Eläke-Fennia
52. HOK-Elanto
53. Kemira Growthow
54. Aker-Yards
55. Uponor
56. Atria
57. Veho
58. Fazer
59. Alko
60. Skanska
61. Borealis Polymers
62. Shell
63. HK-Scan
64. Kuusakoski Group
65. Gasum
66. Pohjolan Voima
67. Toyota Motor
68. Sanitec
69. Consolis
70. Suomen Petrooli
71. Nokian Renkaat
72. Dynea
73. Vahinko Tapiola
74. Eltel Networks
75. Outotec
76. Panasonic
77. Valtra
78. Norilsk Nickel Harjavalta
79. NCC Rakennus
80. Rettig
81. Tuko Logistics
82. Perlos
83. Orion
84. Finnlines
85. Pöyry
86. RAY
87. Nissan Nordic Europe
88. Vapo
89. Schenker east
90. Hewlett-Packard
91. Sandvik
92. Esso
93. Delta Motor Group
94. Volvo-Auto
95. KWH-Yhtymä
96. Veritas Eläkevakuutus
97. Fiskars
98. Andritz
99. Metro-Auto
100. Canon
101. IBM
102. Ramirent
103. Fennia
104. Hämeenmaa OK
105. Planmeca
106. SRV-Yhtiöt
107. Laakkonen
108. Starkki
109. Altia
110. Puukeskus
111. Patria
112. Tokmanni
113. Pirkanmaan OK
114. ISS palvelut
115. Raisio
116. Lassila&Tikanoja
117. KPO
118. Lidl
119. DHL Freight
120. Keskimaa OK
121. Suomi
122. Lännen Tehtaat
123. Finnet
124. Viking Line
125. Paroc Group
126. Cramo
127. Henki-Tapiola
128. Arina OK
129. Vattenfall
130. Yleisradio
131. Veikko Laine
132. Greeni
133. Foster Wheeler
134. Lohja Rudus
135. Siemens
136. Componenta
137. Peeässä OK
138. Finngrid Yhtiöt
139. Sinebrychoff
140. TOK yhtymä
141. TS Yhtymä
142. Sonepar Finland
143. John Deere Forestry
144. Vaasan & Vaasan
145. Suurseudun OK
146. Lujatalo
147. VVO
148. Hartwall
149. Etelä-Pohjanmaan OK
150. Fujitsu Services

## APPENDIX 4; The answers presented in graphs

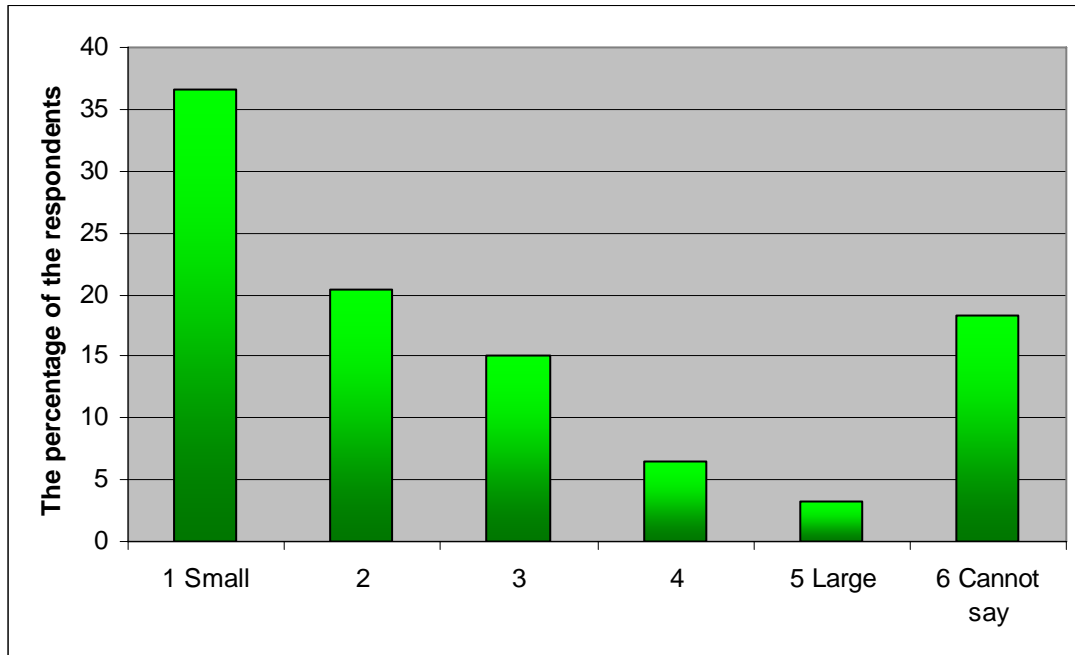
### 1. Respondents and their responsibilities



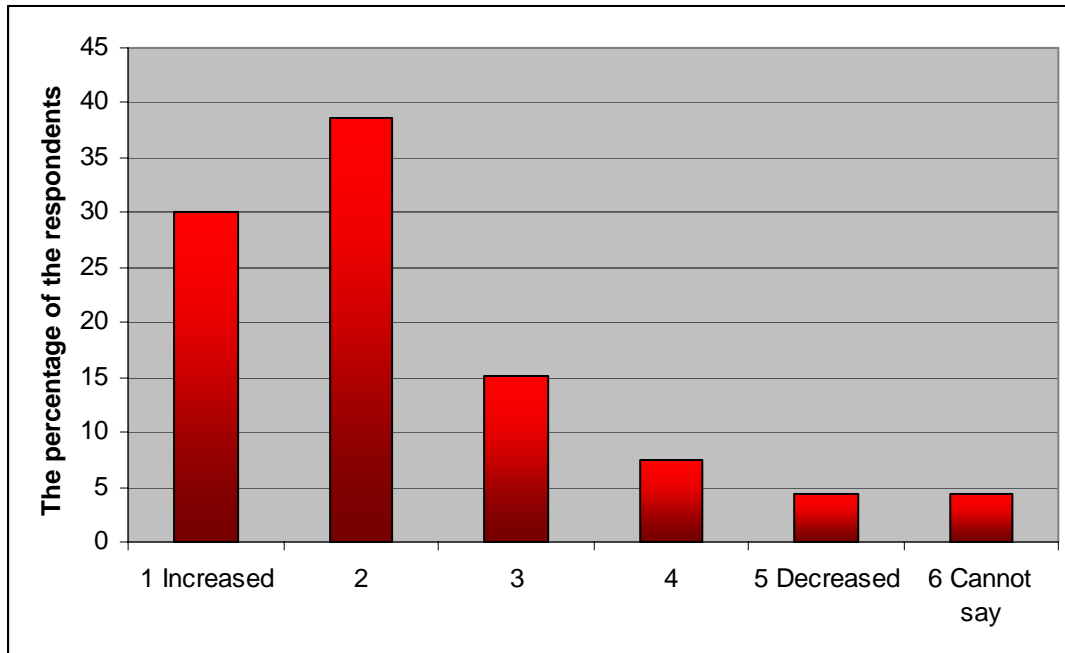
### 2. The division of age



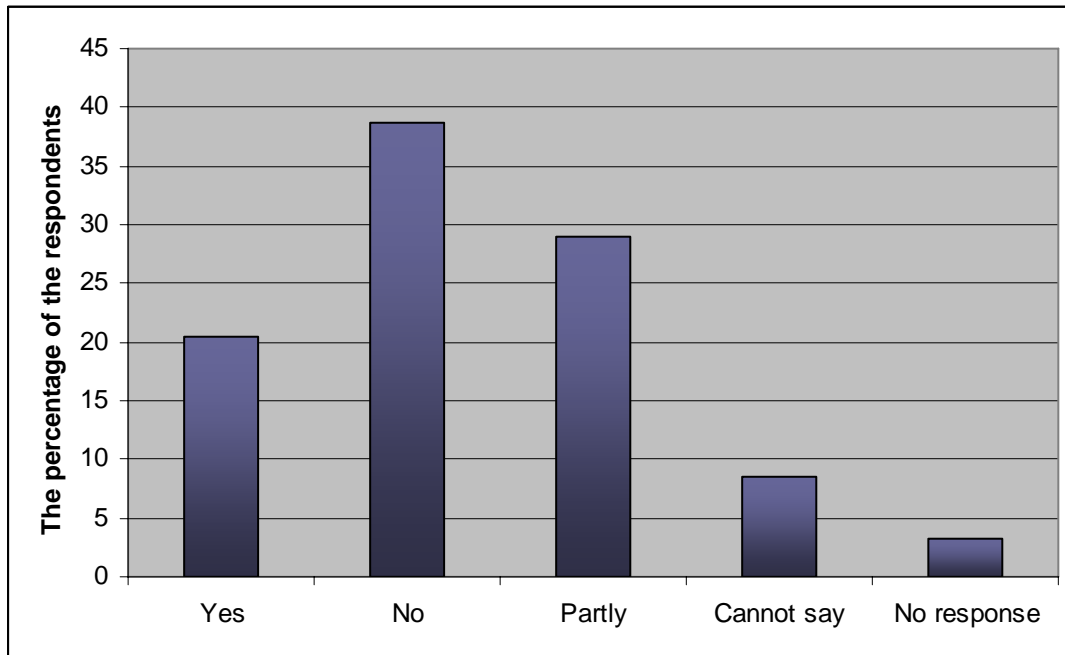
### 3. Carbon footprint caused by business traveling in comparison to companies' overall carbon footprint



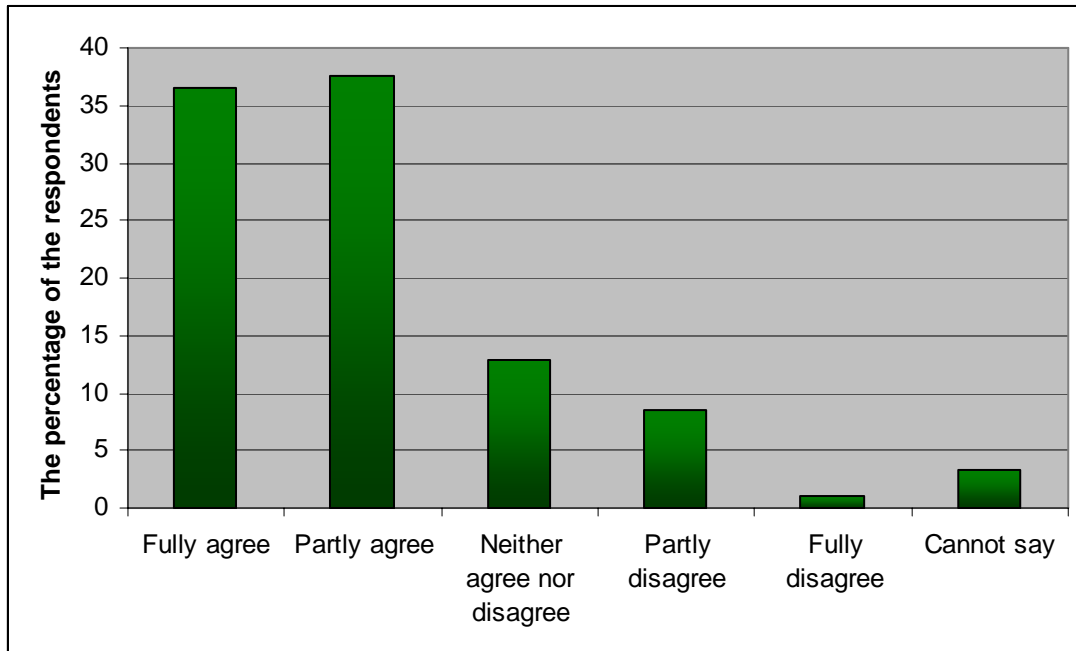
### 4. The amount of business traveling within the last five years



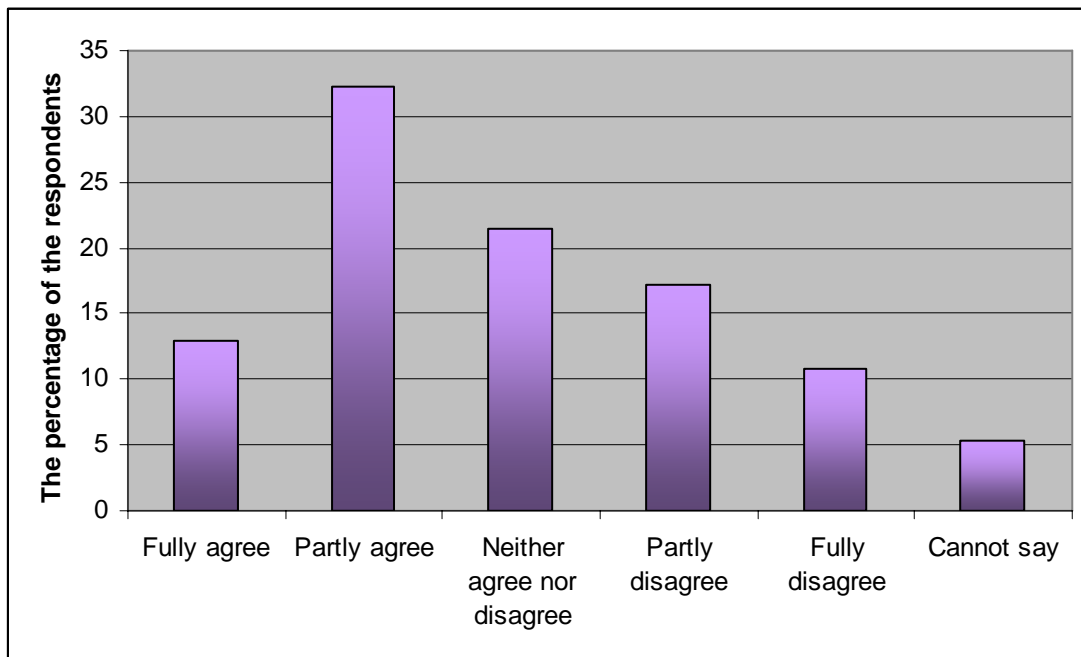
**5. The possibility to calculate the carbon footprint caused by business traveling**



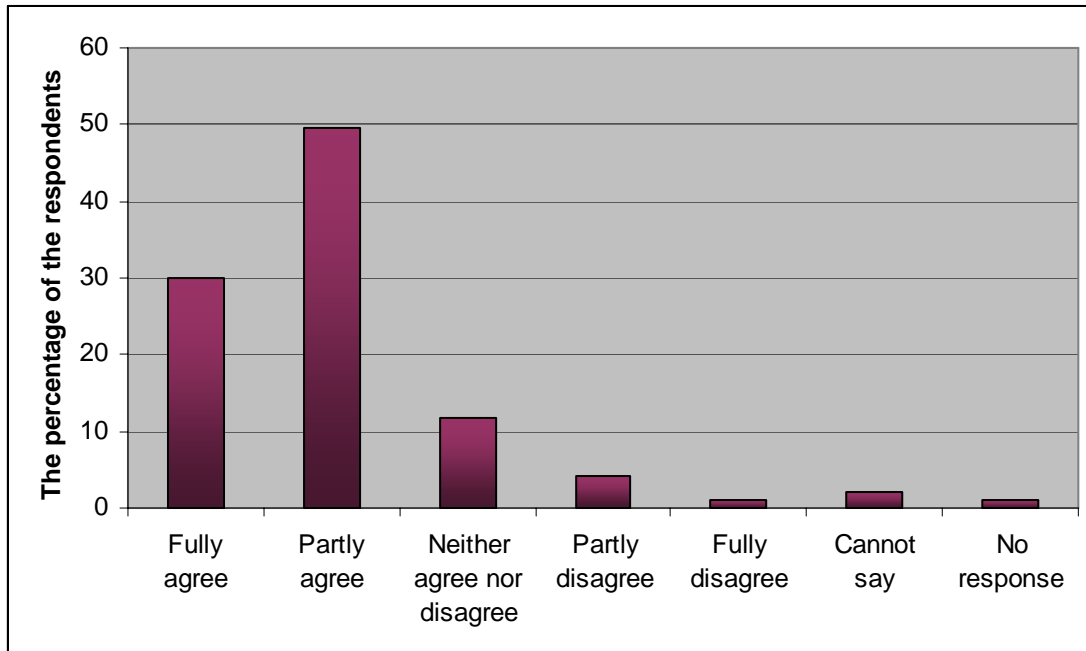
**6. If possible, our organization would be interested in calculating the carbon footprint caused by business traveling**



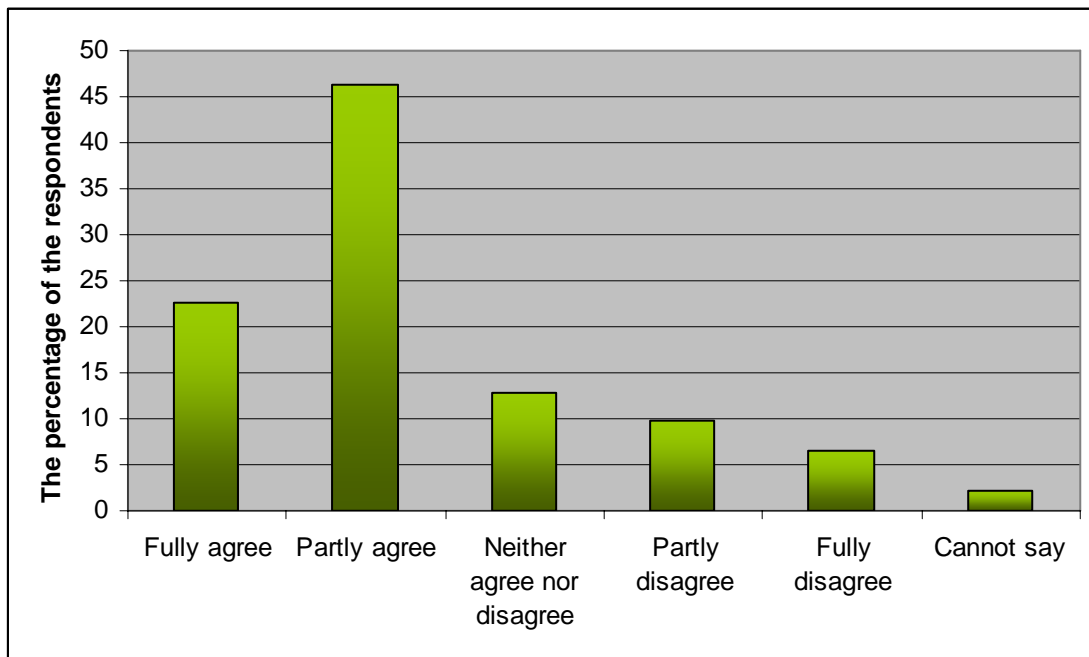
**7. Our organization should compensate the carbon footprint caused by business traveling**



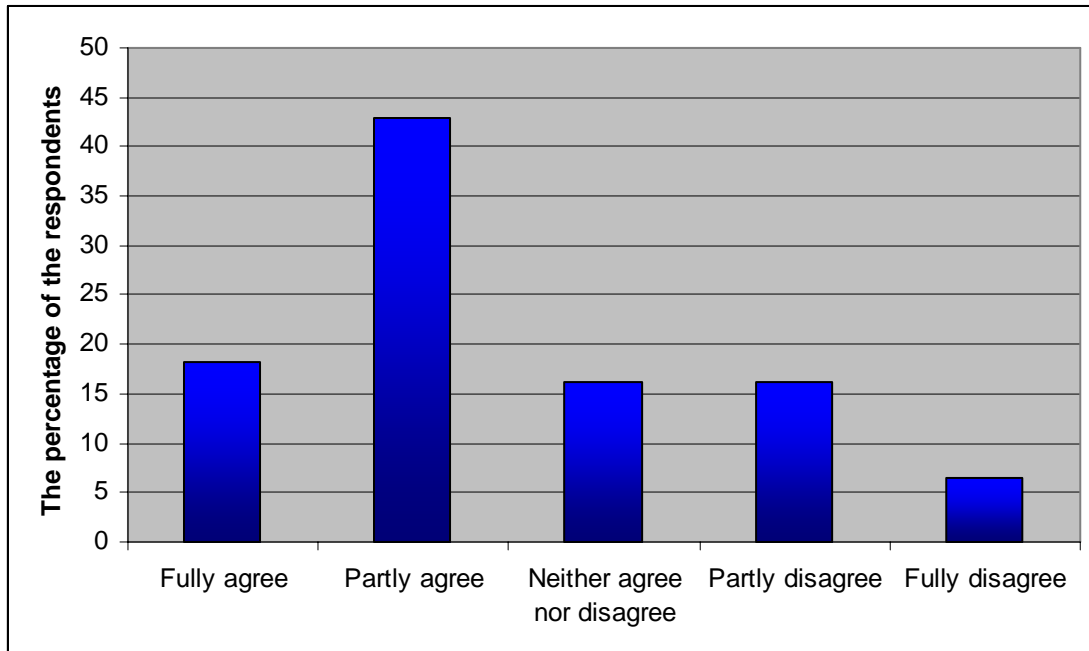
**8. Our organization should take the carbon footprint into account when planning business traveling**



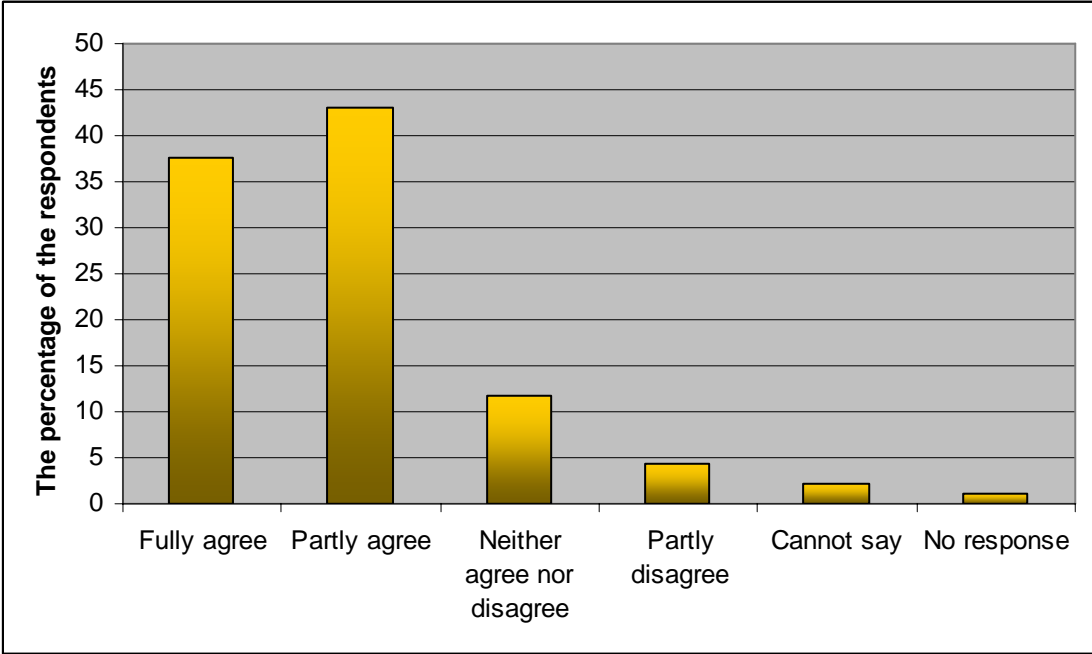
**9. Our organization should decrease the costs by decreasing business traveling**



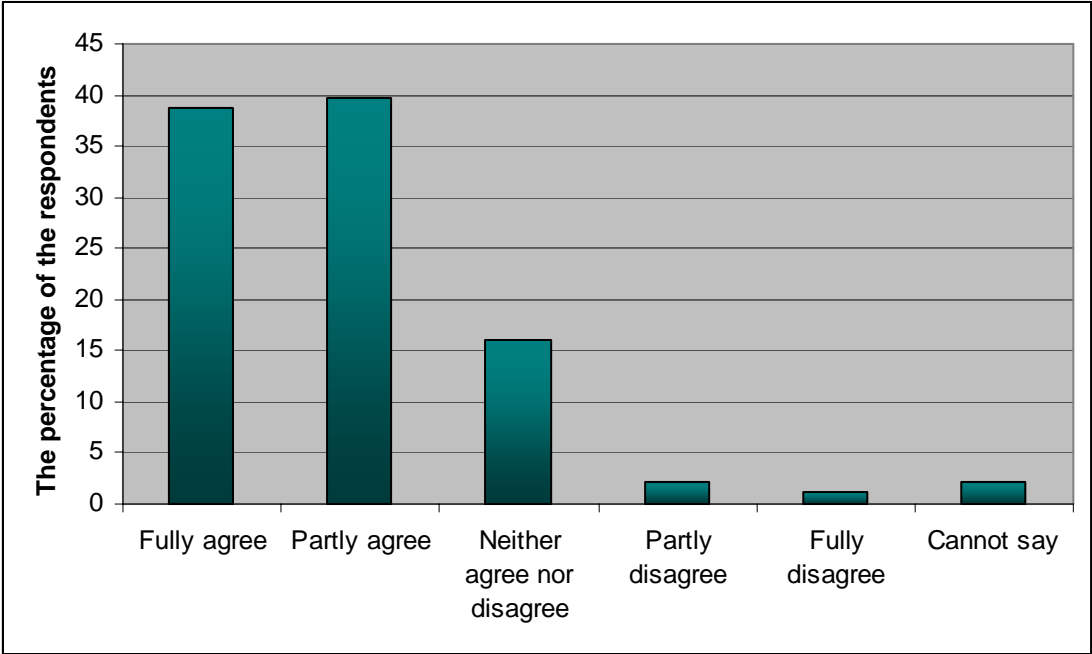
**10. Our organization should decrease the carbon footprint by decreasing business traveling**



**11. Our organization should seek alternative means in order to decrease the carbon footprint caused by business traveling**



**12. I am personally interested in decreasing the carbon footprint of our organization's business traveling**



APPENDIX 5; The answers with Means and Standard deviations presented in SPSS figures

### 1. Carbon footprints caused by business traveling in comparison to companies' overall carbon footprint

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small	34	36,6	36,6	36,6
	+	19	20,4	20,4	57,0
	++	14	15,1	15,1	72,0
	+++	6	6,5	6,5	78,5
	Great	3	3,2	3,2	81,7
	Cannot say	17	18,3	18,3	100,0
	Total	93	100,0	100,0	

	N	Minimum	Maximum	Mean	Std. Deviation
<b>Carbon footprints caused by business traveling in comparison to companies' overall carbon footprint</b>	93	1,00	6,00	2,7419	1,86445
Valid N (listwise)	93				

### 2. The amount of business traveling within the last five years

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increased	28	30,1	30,1	30,1
	++	36	38,7	38,7	68,8
	+++	14	15,1	15,1	83,9
	+++	7	7,5	7,5	91,4
	Decreased	4	4,3	4,3	95,7
	Cannot say	4	4,3	4,3	100,0
	Total	93	100,0	100,0	

	N	Minimum	Maximum	Mean	Std. Deviation
<b>The amount of business traveling within the last five years</b>	93	1,00	6,00	2,3011	1,32521
Valid N (listwise)	93				



### 3. The possibility to calculate the carbon footprint caused by business traveling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	19	20,4	21,1	21,1
	No	36	38,7	40,0	61,1
	Partly	27	29,0	30,0	91,1
	Cannot say	8	8,6	8,9	100,0
	Total	90	96,8	100,0	
Missing	System	3	3,2		
Total		93	100,0		

### 4. If possible, our organization would be interested in calculating the carbon footprint caused by business traveling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fully agree	34	36,6	36,6	36,6
	Partly agree	35	37,6	37,6	74,2
	Neither agrees nor disagrees	12	12,9	12,9	87,1
	Partly disagree	8	8,6	8,6	95,7
	Fully disagree	1	1,1	1,1	96,8
	Cannot say	3	3,2	3,2	100,0
	Total	93	100,0	100,0	

	N	Minimum	Maximum	Mean	Std. Deviation
<b>If possible, our organization would be interested in calculating the carbon footprint caused by business traveling</b>	93	1,00	6,00	2,0968	1,20745
Valid N (listwise)	93				

**5. Our organization should take the carbon footprint into account when planning business traveling**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fully agree	28	30,1	30,4	30,4
	Partly agree	46	49,5	50,0	80,4
	Neither agrees nor disagrees	11	11,8	12,0	92,4
	Partly disagree	4	4,3	4,3	96,7
	Fully disagree	1	1,1	1,1	97,8
	Cannot say	2	2,2	2,2	100,0
	Total	92	98,9	100,0	
Missing	System	1	1,1		
Total		93	100,0		

	N	Minimum	Maximum	Mean	Std. Deviation
<b>Our organization should take the carbon footprint into account when planning business traveling</b>	92	1,00	6,00	2,0217	1,02687
Valid N (listwise)	92				

**6. Our organization should compensate the carbon footprint caused by business traveling**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fully agree	12	12,9	12,9	12,9
	Partly agree	30	32,3	32,3	45,2
	Neither agrees nor disagrees	20	21,5	21,5	66,7
	Partly disagree	16	17,2	17,2	83,9
	Fully disagree	10	10,8	10,8	94,6
	Cannot say	5	5,4	5,4	100,0
	Total	93	100,0	100,0	

	N	Minimum	Maximum	Mean	Std. Deviation
<b>Our organization should compensate the carbon footprint caused by business traveling</b>	93	1,00	6,00	2,9677	1,39449
Valid N (listwise)	93				

**7. Our organization should decrease the costs by decreasing business traveling**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Fully agree	21	22,6	22,6	22,6
Partly agree	43	46,2	46,2	68,8
Neither agrees nor disagrees	12	12,9	12,9	81,7
Partly disagree	9	9,7	9,7	91,4
Fully disagree	6	6,5	6,5	97,8
Cannot say	2	2,2	2,2	100,0
Total	93	100,0	100,0	

	N	Minimum	Maximum	Mean	Std. Deviation
<b>Our organization should compensate the carbon footprint caused by business traveling</b>	93	1,00	6,00	2,3763	1,24162
Valid N (listwise)	93				

**8. Our organization should decrease the carbon footprint by decreasing business traveling**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Fully agree	17	18,3	18,3	18,3
Partly agree	40	43,0	43,0	61,3
Neither agrees nor disagrees	15	16,1	16,1	77,4
Partly disagree	15	16,1	16,1	93,5
Fully disagree	6	6,5	6,5	100,0
Total	93	100,0	100,0	

	N	Minimum	Maximum	Mean	Std. Deviation
<b>Our organization should decrease the carbon footprint by decreasing business traveling</b>	93	1,00	5,00	2,4946	1,15743
Valid N (listwise)	93				

**9. I am personally interested in decreasing the carbon footprint of our organization's business traveling**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fully agree	36	38,7	38,7	38,7
	Partly agree	37	39,8	39,8	78,5
	Neither agrees nor disagrees	15	16,1	16,1	94,6
	Partly disagree	2	2,2	2,2	96,8
	Fully disagree	1	1,1	1,1	97,8
	Cannot say	2	2,2	2,2	100,0
	Total	93	100,0	100,0	

	N	Minimum	Maximum	Mean	Std. Deviation
<b>I am personally interested in decreasing the carbon footprint of our organization's business traveling</b>	93	1,00	6,00	1,9355	1,04055
Valid N (listwise)	93				

**10. Our organization should seek alternative means in order to decrease the carbon footprint caused by business traveling**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fully agree	35	37,6	38,0	38,0
	Partly agree	40	43,0	43,5	81,5
	Neither agrees nor disagrees	11	11,8	12,0	93,5
	Partly disagree	4	4,3	4,3	97,8
	Cannot say	2	2,2	2,2	100,0
	Total	92	98,9	100,0	
Missing	System	1	1,1		
Total		93	100,0		

	N	Minimum	Maximum	Mean	Std. Deviation
<b>Our organization should seek alternative means in order to decrease the carbon footprint caused by business traveling</b>	92	1,00	6,00	1,9130	1,01258
Valid N (listwise)	92				