

**FINNISH COMPANIES' VIEWS ON GAINING ADDED
VALUE ON THEIR BRAND BY OFFSETTING
TRANSPORTATION EMISSIONS**

**Jyväskylä University
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Master's Thesis

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ABSTRACT

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Title Finnish companies' views on gaining added value on their brand by offsetting transportation emissions	
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<p>Abstract</p> <p>As climate change, the greatest threat to the globe, progresses, it is crucial that urgent mitigation actions are taken. One short-term solution is companies participating in voluntary carbon offsetting. There exists little prior literature on the marketing potential embedded in compensating transportation emissions. This thesis aims, thus, to fill this gap in knowledge. The effect of compensation project types on the purchase decision is also relatively unknown but is investigated in this study. This thesis acts, in addition, as a market research for a case company, Wiima Logistics Oy.</p> <p>The aim of this quantitative research was to explore Finnish companies' views on gaining added value on their brand by offsetting transportation emissions, for instance if the companies are provided with a certificate indicating carbon neutral transportation, as well as the influence of offset project types on the purchase decision. An online survey was conducted in April 2021, in which 60 of the case company's clients around Finland participated.</p> <p>The results revealed that companies that have set carbon neutrality goal, had compensated emissions in the past more than companies without said goal. In general, companies saw that compensating transportation emissions could potentially be a part of their operations and strategies, and that a certificate would bring added value to their brand or product. The offset project type also heavily influences the willingness to pay for such services.</p> <p>According to the conducted survey, carbon neutral transportation service appeals most to companies with set carbon neutrality goals. The most appealing offset project types were identified as investing in renewable energy and forestry-related projects. As a result of this study, the case company gained valuable information on their clients' demand for carbon compensated transportation service, which can be utilized in future strategy development.</p>	
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<p>Tiivistelmä</p> <p>Ilmastonmuutoksen kiihtyessä on välttämätöntä, että sen vaikutuksia lieventäviä toimenpiteitä tehdään, sillä se on tällä hetkellä maapallon suurin uhka. Yritysten harjoittama vapaaehtoinen hiilikompensaatio voi toimia lyhyen aikavälin hillitsemisratkaisuna. Kuljetuspäästöjen kompensoinnin sisältämästä markkinointipotentiaalista ei ole juurikaan aiempaa kirjallisuutta, joten tämä tutkielma pyrkii paikkaamaan aukkoja tiedossa. Kompensaatioprojektityypin vaikutus yritysten ostopäätökseen on myös suhteellisen tuntematon aihe, johon tällä tutkielmalla pyritään saamaan lisätietoa. Tämä työ on tehty osittain yhteistyössä Wiima Logistics Oy:n kanssa, jolle työ toimii markkinatutkimuksena. Tämän kvantitatiivisen tutkimuksen tavoitteena oli selvittää suomalaisten yritysten näkemyksiä kuljetuspäästöjen kompensoinnin brändille tai tuotteelle tuomasta lisäarvosta, esim. kompensaatiosta ilmaisevan sertifiointin muodossa. Lisäksi yritysten näkemyksiä kompensaatioprojektityypin vaikutuksesta ostopäätökseen kartoitettiin. Tutkimus toteutettiin verkkokyselynä huhtikuussa 2021 ja siihen osallistui 60 yhteistyöyrityksen asiakkasta ympäri Suomea. Tutkimuksen tulokset osoittivat, että yritykset, jotka ovat asettaneet hiilineutraaliustavoitteen, ovat todennäköisemmin kompensoineet päästöjään kuin muut yritykset. Yleisesti ottaen yritykset näkivät hiilineutraalin kuljetuksen potentiaalisesti toimivan osana yrityksen toimintaa ja strategioita, ja että tätä ilmaiseva sertifikaatti toisi lisäarvoa niiden brändille tai tuotteelle. Myös kompensaatioprojektityypillä huomattiin olevan merkittävä vaikutus yritysten ostohalukkuuteen palvelun suhteen. Tutkimustulosten perusteella hiilineutraali kuljetus vetoaa eniten yrityksiin, jotka ovat asettaneet hiilineutraaliustavoitteen. Yrityksiin eniten vetoavat kompensaatioprojektityypit olivat tutkimuksen mukaan uusiutuvan energian rahoittaminen, sekä metsiin liittyvät projektit. Tutkimuksen tuloksena yhteistyöyritys sai tietoa asiakkaidensa tarpeista palvelua kohtaan, jota se voi hyödyntää kehittäessään tulevaisuuden strategioitaan.</p>	
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1 INTRODUCTION

1.1 Background

As globalization continues to progress with the global rate of trade to follow the same pattern, increasing to US\$18.8 trillion in 2019 from around US\$10 trillion in 2005 (United Nations Conference on Trade and Development, 2021), the issues with emissions generated by transportation cannot be neglected. The COVID-19 pandemic declined the trade rate, but the volume of traded goods is estimated to rebound by 7.2 percent in 2021, still leaving it below the pre-pandemic volume (World Trade Organization, 2020). However, as the recent trade rate development shows, the volume of traded goods should not decrease in any time near. As presented by IPCC (2014) in the foundation research for Paris Climate Agreement, transportation accounted for 14.0 percent of the global greenhouse gas (GHG) emissions. Two years later the share of transportation related emissions had increased to constitute for 16.2 percent of global GHG emissions (Our World in Data, 2020), meaning that the issue with increased international trade in relation to climate change needs to be addressed rather soon. Out of the above-mentioned 16.2 percent, freight transportation accounted for around 7.2 percent and passenger travel for 9.0 percent. The most common modes of freight transportation include road, maritime, rail, and air freight. (Our World in Data, 2020).

Anthropogenic GHG emissions are currently at their highest in the recorded history and the influence human activities have on the climate system is definite. The effects of climate change impact the natural environment in various and vast ways, thus also heavily affecting humans. One effect of climate change is global warming, and observations already indicate oceans to have warmed, snow and ice covers diminished, and sea levels risen as a result. The likelihood of drastic and irreversible impacts on ecosystems will increase the more anthropogenic GHG emissions are continued to be released into the atmosphere. Climate change risk mitigation requires substantial reductions in GHG emissions in addition to necessary adaptation measures. (ICPP, 2014). In hopes to prevent disastrous climate change effects, 196 parties have signed The Paris Agreement, an international and legally binding treaty on climate change, which entered into force in 2016. The aim of the treaty is to limit global warming below 2 degrees Celsius in comparison to pre-industrial levels. The above-mentioned 2 degrees Celsius is a long-term goal, which would require globally emitted GHG emissions to be at net-zero-level by 2050. To achieve this, global GHG emissions should peak as soon as possible. (UNFCCC, 2021).

Climate actions take place on multiple levels, such as global in terms of agreements and treaties, national in terms of goals set by sovereign states, and

local in terms of cities setting their own GHG emission reduction strategies. Naturally, there also exists long-term and short-term targets. The European Union has set a target to reduce GHG emissions between the member states by 40 percent by the year 2030 including all polluting sectors. However, an updated goal is set to be proposed by the European Commission in June 2021, inclining the target amount of GHG emissions to reduce by at least 55 percent by 2030. (European Union, 2021). On a national level, Finland has a much more ambitious plan in reducing the GHG emissions it generates, as it has set an aim to become the first carbon neutral welfare state in the world by 2035. The government of Finland emphasizes that the root causes of sustainability crisis, which include for instance climate change and loss of biodiversity, need to be addressed on all levels of the society. The goal of becoming carbon neutral is achieved by introducing drastic political changes, which support sustainability, for instance into construction and energy industries, and to support the development of circular economy. The government also states that taxation and legislation need to be renewed to serve the purpose. (Ministry of the Environment, 2021).

As mentioned above, the sustainability crisis needs to be addressed on all levels of society, thus companies cannot be excluded from taking action. Political and legislative changes are introduced to mitigate the climate crisis, which further encourage companies to act. Climate change is also widely recognized by companies to hold a significant risk to their operations. Thus, companies are for instance mitigating their carbon emissions, developing sustainable products and services, and preparing to adapt to the negative impacts of climate change. Investors lay further pressure to companies to introduce climate change actions and increasingly demand companies to have risk management strategies in place. (Pattberg, 2012). As companies recognize the risks involved in the progression of climate change and begin to act accordingly, they have a significant role in global climate change mitigation. Pattberg (2012) elaborates that companies face various risks depending on, for instance, on their industries and physical locations. The risks companies are attempting to mitigate by taking action can be roughly divided into four categories. As previously mentioned, regulatory risks force companies to anticipate changes in regulations, and to some extent act in advance. Secondly, physical risks are threatening production and transportation as extreme weather events occur more frequently. Reputational and competitive risks are also threatening companies that do not introduce sustainability actions into their operations, which will be discussed in more detail in next paragraph. Finally, risks from litigation are present especially with companies operating in carbon-intense industries.

Companies around the world have various environmental strategies and strategies to become more sustainable, thus ultimately also playing a role in the climate change mitigation efforts. The strategies are incorporated into production, processes, and policies, including for instance waste and energy reduction, putting environmental management systems into action, and switching to renewable energy (Wang, Weian, & Qi, 2020). The reasons driving companies to take action

vary, however. Companies may introduce reactive strategies, that revolve around meeting the bare minimum environmental regulatory requirements, often to mitigate litigation risks. On the other hand, proactive strategies that companies introduce comprise of pollution prevention and strengthening environmental capabilities of the company in general and involve different stakeholder groups in the development of said strategies. (Wang et al., 2020). Nadanyiova, Gajanova, and Majerova (2020) indicate that environmental protection is an increasing trend among consumers, which naturally reflects on companies and their marketing strategies as they desire to meet the demands of this uprising target group. The above-mentioned is an example of the power individuals hold in climate change mitigation. Young adults in particular have more demands regarding the sustainability on the products they purchase (Nadanyiova et al., 2020). Furthermore, individuals and companies can manage the GHG emissions their actions generate for instance by compensating them. This thesis focuses on the compensation from companies' viewpoint, thus compensations by individuals are not further discussed.

Carbon offsetting can be divided into two categories based on voluntarism: regulatory market (CDM = Clean Development Mechanism) and voluntary market (VCM = Voluntary Carbon Market). The names are quite self-explanatory, but the basic principle between the two is the same: to invest in reducing carbon dioxide emissions to offset carbon dioxide emitted elsewhere by purchasing carbon credits. (Tsai, 2020). The constantly growing VCM is used by companies trying to reduce their carbon footprint or bring their operation to net-zero level. This is primarily done to demonstrate corporate social responsibility (CSR) and possibly to furbish a green company image. (Climate Corporation, 2020). The larger regulatory market, on the other hand, is used by companies and governments to enable them to meet their mandatory emission reduction targets or carbon dioxide emission caps (Tsai, 2020). The focus in this thesis is on VCM as the research tries to find out whether companies see that offsetting transportation emissions would bring added value to their brand or product. Offset project types within VCM include for instance investments on renewable energy and forest management (Forest Trends Ecosystem Marketplace, 2020). Some of the largest operators in the rapidly growing carbon credit market are Verified Carbon Standards, Gold Standard, The Climate Action Reserve, and American Carbon Registry (Hamrick & Goldstein, 2016; Lovell, 2010). However, if companies desire to compensate their transportation related emissions by purchasing carbon credits directly from, for instance, the above-mentioned carbon credit providers, they would need to calculate their transportation emissions, which may prove to be a difficult task, especially for companies who have outsourced every aspect of their logistic operations.

This research aims to find out whether carbon neutral transportation services purchased from the logistics provider would bring added value to the brand or product of the company purchasing the service. Furthermore, this thesis

focuses more specifically on Finnish companies' views on the topic. There currently exists only one big operator in the market directly providing transportation emission compensation services for corporate clients in Finland. DHL, a German company, recognizes sustainability as an important competitive factor for their clients (DHL, 2020), which results in pressure on suppliers to offer corresponding services. According to the company, in addition to customers demanding more visibility and activity on the terms of sustainability efforts, investors are insisting corporations to reduce environmental risks and resource-dependencies. This is supported by figures from the United States, where the popularity of sustainable investment strategies has increased by 42 percent from 2017 to 2019. The \$17.1 trillion invested sustainably represent 33 percent of all assets invested in the US. (The Forum for Sustainable and Responsible Investment, 2020).

1.2 Research questions

The aim of this Master's Thesis is to investigate viewpoints behind companies' willingness to pay for a premium service in offsetting the GHG emissions generated in their freight transportation. The study reflects the issue from the viewpoint of generating added value to companies' products or brand gained through carbon neutral transportation. Thus, another aim of the research is to find out whether companies see that compensating their transportation emissions would bring added value to them. Offsetting and compensating emissions are referred to as compatible concepts in this thesis. Furthermore, carbon neutral transportation refers to the service of compensating transportation related carbon emissions.

Additionally, this research seeks to find out whether the offset project type has an influence on companies' purchase decisions regarding the service and whether companies' marketing strategies, in terms of business-to-business (b2b) versus business-to-consumer (b2c), have an influence on the outcome of the research.

The literature on companies' views on utilizing emission compensation as part of their marketing strategies is extremely limited. Compensation practiced by individuals is more examined but does not directly affiliate to this thesis. Furthermore, focusing on the marketing potential of compensating the emissions generated by transportation of goods has not been researched. Even though data on the most popular offset project types indicates that renewable energy related, and forestation offset projects are the most purchased in VCM (Forest Trends Ecosystem Marketplace, 2020), no literature on whether the project type has an influence on the purchase decision could be found. In addition, the above-mentioned data represents global demand, and not the situation in Finland.

A Master's Thesis by Hildén (2020) investigated corporate attitudes towards emission compensation and found through interviews on selected Finnish companies' representatives, that organizations that have climate targets are more interested in compensating their emissions. In addition, companies that consider

salient stakeholders more within their strategies, are more willing to compensate emissions. The thesis found that better branding is desired regarding compensation services in order for the companies to be able to utilize them more efficiently in branding and marketing. (Hildén, 2020).

Similarities can be found between this thesis and the above-mentioned work, but in the context of this study, the scope is narrowed down to concern added value generated by offsetting transportation emissions. This thesis aims to close gaps in knowledge about how companies perceive the benefits gained on their brand or products in terms of marketing potential. In addition, this thesis serves as a market research for the case company introduced in the next paragraph.

This study is conducted in cooperation with a Finnish fourth party logistics service provider Wiima Logistics Oy (referred to as case company from now on), whose desire was to gain knowledge on their clients' views on carbon offsetting and on future sustainability goals in general. The company describes its core skills to involve logistics management, which includes measuring and reporting (Wiima Logistics, 2019). A strong background in measuring and reporting justifies company's intention to possibly provide their clients with compensation services based on the exact transportation emissions. Although the case company offers fourth party logistics services, which includes managing clients' entire logistics needs (Wiima Logistics, 2019), this thesis focuses only on compensating transportation emissions, or carbon neutral transportation as it may also be called. Cooperating with the company enabled a very practical approach to this thesis and limits the topic naturally. By gaining knowledge of their client's viewpoints on the topic, the case company will be able to develop their business strategy by for instance introducing a premium service in carbon neutral transportation. On the other hand, if the results indicate that there is no demand for such service, the company can focus their efforts elsewhere. Thus, the research questions of this Master's Thesis are:

RQ1: Do companies see carbon neutral transportation to be a valid part of company strategies, as in bringing added value on their brand or product?

RQ2: Does the offset project type have an influence on the compensation purchase decision?

The data for the research was collected via an online questionnaire and the scope of the study originates from the case company's customer base, which limits the research to only include Finnish companies purchasing import and export logistics services. Thus, domestic transportation services are out of the scope of this research. Companies requiring transportation for bulk commodities, such as timber, are excluded from this study as the case company does not offer such transportation services.

1.3 Structure of the Thesis

This thesis begins by introducing a theoretical framework, in which transportation environmental impacts are discussed first. Then, carbon offsetting as a concept is described. The current state of VCM is furthermore discussed in more detail. As this thesis studies companies' attitudes towards carbon offsetting from marketing viewpoint, competitive advantage and green marketing are examined in the latter part of the theoretical framework.

After the theoretical framework, the thesis moves on to describe and justify the chosen research methods. Also, the online questionnaire created for data collection is described in more detail. A brief introduction of the questionnaire participants is presented, as well as the data analysis methods. The methodology chapter is followed by the results of the survey, as well as discussion of the presented results. Finally, the validity and reliability of the research are discussed, followed by propositions for future research.

2 THEORETICAL FRAMEWORK

2.1 Transportation and the environment

Transportation accounted for 14 percent of global GHG emissions in 2010, with the percentage consisting of fossil fuels combusted in road, rail, air, and marine transportation. 95 percent of the energy used in the above-mentioned modes of transportation is generated by burning petroleum-based fuels. (IPCC, 2014). The above-mentioned figures were included in the background material for Paris Climate Agreement and are therefore worth mentioning even though the data is already slightly outdated. The most recent figures on transportation sectors share on the global emissions is from 2016, indicating the sector to account for 16.2 percent of the total emissions worldwide, as presented in Figure 1. However, it consists of both, passenger travel and freight transportation. (Our World in Data, 2020).

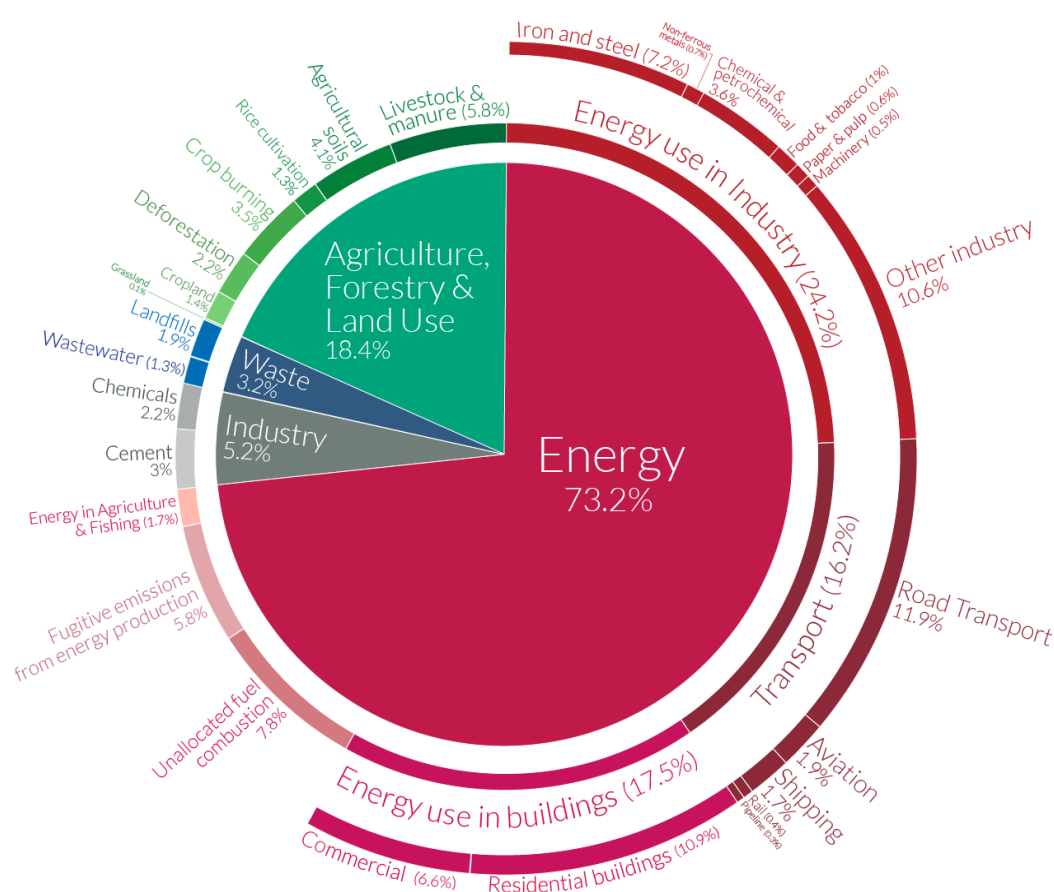


Figure 1 Global GHG emissions by sector (Our World in Data, 2020)

Figure 2 illustrates freight transportations share of the total emissions. Freight transportation accounts for around 7.2 percent of the global GHG emission, while the 9.0 percentage consist of passenger travel and pipeline transportation, such as oil, gas, water, and steam. Road freight is the biggest emission generating mode of freight transportation with a 4.76 percentage share of global GHG emission, followed by maritime freight with a share of 1.7 percentage. Rail freight accounts for 0.4 percentage, and air freight for 0.36 percentage of the global GHG emissions. (Our World in Data, 2020).

GHG emissions from transportation

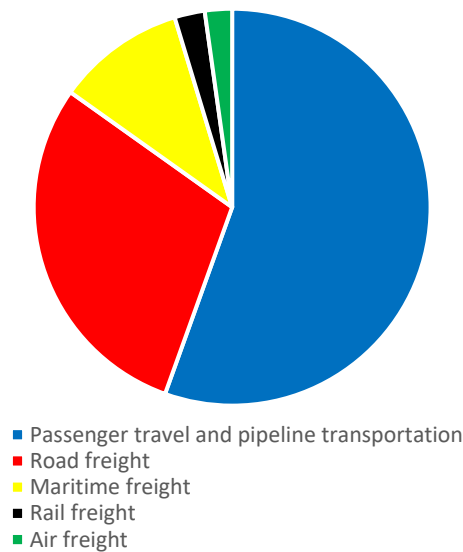


Figure 2 GHG emission shares of different modes of transportation, adapted from Our World in Data (2020)

Zhu and Gao (2019) studied the relationship between transportation-related carbon emissions and the level of urbanization, transportation energy consumption structure, per capita GDP, technical level, and trade openness. The study revealed a stable and abiding relationship between the concepts. For instance, when urbanization increases by 1 percent, carbon emissions from transportation industry follows with an increase of approximately 7.7 percent. On the contrary, the research indicates that 1 percent increase in technology level should reduce the carbon dioxide emissions by approximately 2.2 percent. As globalization and urbanization continue to increase, the emissions from transportation cannot be seen to decrease globally. (Zhu & Gao, 2019).

CO₂ emissions have contributed to around 78 percent of the total GHG emissions from 1970 to 2010. The effects of GHG's together with other anthropogenic drivers are the dominant force behind global warming, a crucial element in climate change. (IPCC, 2014). GHG's trap about 90 percent of the heat radiation reflected by the earth's crust and seas, which means that the more GHG's are

present in the atmosphere, the more heat radiation is unable to escape to space (Ilmatieteen laitos, 2021). The observed effects of climate change include for instance precipitation changes, glaciers losing mass, warming oceans, ocean acidification, behavioral changes in plant and animal species, and rising sea-level (IPCC, 2014).

There are, naturally, other negative transportation-related impacts to the environment besides GHG emissions. All modes of transport create noise pollution, which affects both terrestrial and aquatic wildlife. For instance, population declines, increased difficulty for alertness and foraging, and vocal behavior alterations are common symptoms in noise polluted areas. (Graeme et al., 2016). Mostly related to road freight, tire wear microplastics get transported to soils and bodies of water by rainwater runoff (Kole, Löhr, Van Belleghem, & Ragas, 2017), and building transportation infrastructure may have substantial regional negative environmental impacts, for instance, on forest cover (Asher, Garg, & Novosad, 2018). Maritime pollutants include, for instance, intentional and unintentional oil and other matter disposals from ships, as well as antifouling paint released to the water from ship hulls (Todd, Ong, & Chou, 2010). Nevertheless, to reduce the impacts of climate change, the most crucial environmental risk, GHG emissions need to be reduced substantially and carbon neutrality achieved by the second half of this century (European Environmental Agency, 2020).

2.2 Carbon offsetting

Tsai (2020) defines carbon offsetting as “A reduction in emissions of carbon dioxide or greenhouse gases made in order to compensate for or to offset an emission made elsewhere.” The offset amount of carbon dioxide needs to be equivalent to the amount of carbon dioxide or other GHG emitted i.e., one ton of compensated carbon represents a ton of carbon emissions or the equivalent amount of other GHG’s (Brouwer, Brander, & Van Beukering, 2008; Tsai, 2020). The model of purchasing carbon credits, which are used to offset emissions, can be seen to have evolved from the polluter pays principle, a regional custom in environmental law, in which “the party responsible for producing pollution is responsible for paying for the damage done to the natural environment.” (UNESCWA, 2020).

As previously explained, there are regulatory (CDM) and voluntary (VCM) markets for purchasing carbon credits used in offsetting. The regulatory market is larger out of the two and is used by companies, as well as governments, to purchase offsets in order to meet their mandatory emission reduction targets or carbon dioxide emission caps. The smaller voluntary market, on the other hand, is used by individuals, companies, and governments to mitigate the carbon diox-

ide emissions generated in different parts of their operations, such as transportation. (Tsai, 2020). Established in the Kyoto Protocol in 1997, CDM was considered to be very bureaucratic and inflexible, thus the VCM emerged somewhat independently to provide an effortless and flexible compensation method. However, in VCM the purchased carbon credits can either be verified by external auditors or not, making the market incoherent to some extent. In addition, issues such as local community involvement and reduction measurements are more difficult to regulate due to the informality of some actors in VCM. (Lovell, 2010). Regardless, companies are using the constantly growing voluntary carbon market to reduce their carbon footprint or bring their operation to net-zero level. This is partly done to demonstrate CSR and to furbish a green company image. (Climate Corporation, 2020). To enhance the credibility of the carbon credits purchased from VCM, voluntary certification methods have been developed (Andonova & Sun, 2019).

A simplified illustration of the process of a company purchasing carbon credits is presented in Figure 3. In the first step, a company needing the credits contacts a credit provider. The credit provider runs various offset projects elsewhere to mitigate carbon emitted by the company purchasing the credits. By funding projects to mitigate an equal amount of carbon emitted, carbon credits are appointed to the purchasing company to use, for instance, in order to gain competitive advantage, which will be discussed in more detail in chapters 2.4 and 2.5.

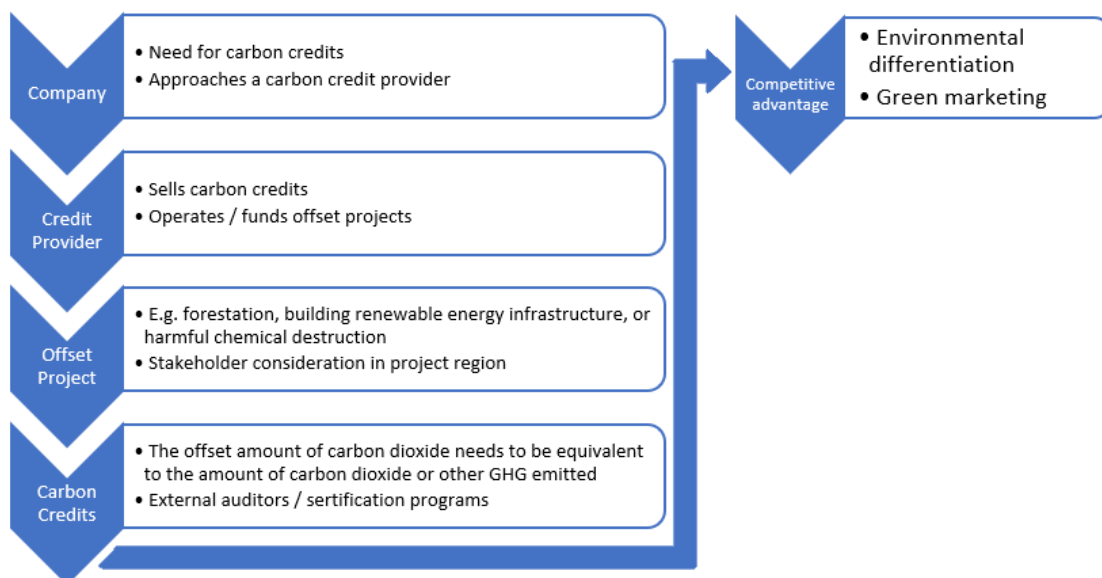


Figure 3 The process of purchasing carbon credits from VCM

Other concepts for companies to reduce their carbon emissions include carbon tax and carbon trading. Carbon tax is a form of pollution tax that targets energy sources emitting carbon dioxide. It is in place to mitigate the total carbon

emissions produced by companies by making it more expensive to emit larger amount of carbon dioxide. Carbon tax encourages companies to innovate less-emitting methods of production. Carbon trading is based on carbon caps designated to companies by governments, in which each company has a limit of emissions they are allowed to emit. Companies are allowed to sell and buy permits between each other to meet individual needs regarding carbon dioxide emissions. The idea behind carbon trading is that governments set national emission caps that need to be met by the companies as a whole. (Tsai, 2020).

Some of the largest carbon credit providers in the VCM include Verified Carbon Standards, Gold Standard, The Climate Action Reserve, and American Carbon Registry, and the industry is growing rapidly (Hamrick & Goldstein, 2016; Lovell, 2010). Actors in VCM support both short-term and long-term projects in order to compensate emissions generated elsewhere. Such projects include for instance building renewable energy infrastructure, energy efficiency projects, forest protection, and perhaps the most common in the minds of average person – forestation projects (Tsai, 2020). The largest carbon credit providers operate projects such as improved forest management, reforestation of degraded land, transport efficiency improvement, destruction of ozone depleting substances, livestock gas capture and combustion, and water security to name a few (American Carbon Registry, 2021; Climate Action Reserve, 2021; Gold Standard, 2021).

Lovell (2010) emphasizes that despite the differences in e.g., formality and flexibility between CDM and VCM, it is important that the two mechanisms co-exist in the future as well due to the ever-growing threat of climate change and the need of mitigation and adaptation it requires. Lang, Blum, and Leipold (2019) point out that VCM operations are needed especially in developing countries as they act as a platform for sustainability innovation. A mechanism for non-governmental climate change mitigation and adaptation may be crucial in developing economies.

Critique towards the VCM has also been demonstrated. Andonova and Sun (2019) for instance express concerns that developing countries do not wish to be exploited as platforms for low-cost mitigation projects that may decrease innovation and incentivize continued production, such as HCFC-destruction (hydrochlorofluorocarbons). The authors emphasize that VCM can act as a great platform for developing countries to take part in the governance of the offset projects and thus contributing to climate change mitigation. This, however, requires public commitment as well as private action in terms of long-term institutional support. (Andonova & Sun, 2019). Gössling et al. (2007) studied carbon offsetting in the aviation industry and emphasize carbon offsetting to be viewed as short-term solution since the mechanism does not encourage innovations to reduce the emissions where they are originally generated, and that the direct emissions themselves do not disappear regardless of compensation measures. The authors continue to warn that if not treated as a temporary solution, carbon offsetting can

potentially encourage people to consume more. Also, the more offsetting is conducted, the less low-cost offset options are available in the future (Gössling et al., 2007). Watt (2021) takes the critique even further describing actors in VCM as authority figures that subjects are willing to submit to, referring to the partial complexity of the VCM. According to the author, carbon offsetting is a playground consisting of material and discursive hassle, which includes miscommunication and wrongful knowledge construction.

2.3 The current state of VCM

A study by Baumeister (2011) revealed that most corporate customers flying with Finnish airline company Finnair saw that compensating carbon emissions generated on their business trips had a positive impact on the environment. Despite this, only one in ten had compensated their emissions. Baumeister (2011) also received an 80 percent support from the participants on whether Finnair should offer compensation options. The above-mentioned indicates that companies are not in general willing to pay extra for compensations if they do not see financial incentives in it. As in environmental differentiation (see chapter 2.4), corporate customers are more willing to pay for premium price on environmentally differentiated service if they benefit from it in financial terms (Reinhardt, 1998). Reinhardt (1998) explains that e.g., building green brand image or fulfilling regulatory requirements, are reasons behind this. The carbon credit market is extremely competitive, and compensation is also likely to present companies with high social and economic benefits (Lin & Lin, 2015). Another reason to engage in emission compensation is the environmental pressure received from different stakeholder groups, which may force companies to act beyond-compliance. Thus, companies may choose to compensate generated emissions on parts of their value chain and purchase carbon credits from VCM. (Andonova & Sun, 2019).

As the popularity of carbon neutrality pledges among companies increases, so does the need for carbon offsetting. Despite the negative effects brought to economies worldwide by the Covid-19 pandemic, VCM is presenting near-record volumes in transacted carbon credits with an increase of 6 percent in total volume from 2018 to 2019, and predictions for 2020 to be a new record year in total carbon credit transactions. Even though traditional VCM market participants, such as the airline industry and the tourism industry, have decreased their carbon credit transaction activity, many other globally significant companies, such as Amazon and Microsoft, have propagated other businesses and industries to increase their activity in carbon credit transaction, as they have pledged carbon neutrality. (Forest Trends Ecosystem Marketplace, 2020).

Companies purchasing carbon credits do not typically have control over the practicalities of the carbon offset project (Lin & Lin, 2015). The project itself is, however, in the domain for credit purchaser to choose from. Figure 4 repre-

sents the total volumes, average prices, and total values of different offset categories in 2019. The figures are based on Forest Trends Ecosystem Marketplace's (2020) annual market survey.

	VOLUME MtCO ₂ e	AVERAGE PRICE	VALUE
RENEWABLE ENERGY	42.4	\$1.4	\$60.1 M
FORESTRY AND LAND USE	36.7	\$4.3	\$159.1 M
WASTE DISPOSAL	7.3	\$2.5	\$18.0 M
HOUSEHOLD DEVICES	6.4	\$3.8	\$24.8 M
CHEMICAL PROCESSES/ INDUSTRIAL MANUFACTURING	4.1	\$1.9	\$7.7 M
ENERGY EFFICIENCY/ FUEL SWITCHING	3.1	\$3.9	\$11.9 M
TRANSPORTATION	0.4	\$1.7	\$0.7 M

Figure 4 Offset category market shares (Forest Trends Ecosystem Marketplace, 2020)

The two most popular offset categories are renewable energy with 42.57 percent market share, and forestry and land use with 36.85 percent market share. Large volume in renewable energy offset category is affiliated with the low average price of compensation, whereas the total value of forestry and land use category is significantly higher than in renewable energy, despite having less total volume, due to much higher average price. The transaction volume of renewable energy has increased by 78 percent in a year, while the average price declined by 16 percent. The transaction volume of forestry and land use decreased by 30 percent in the same time period. The popularity of forest and land use offset category is based on companies willing to pay premium for credits thought of having strong environmental credentials. (Forest Trends Ecosystem Marketplace, 2020).

Figure 5 represents the most popular offset project types by volume in 2019, also indicating the average prices for each project type. In the category of renewable energy, wind was the dominant project type by volume, followed by solar. The third most popular project type by volume in said category was run-of-river hydro. Non-specified renewable energy project types were transacted the most by volume, but there is no data available indicating the different components comprising the total amount for this project type. The majority of renewable energy projects were conducted in India and China, and were typically transacted below average market price, which explains the popularity of the offset category. By far the most popular offset project type, however, was REDD+ when

avoided unplanned deforestation and avoided planned deforestation project volumes are combined. REDD+ comprises of various forest management activities that are conducted across developing countries, and often also contribute to the UN's Sustainable Development Goals for instance in terms of job provision and support of indigenous people. (Forest Trends Ecosystem Marketplace, 2020). The project type aims to incentivize developing countries to contribute to climate change mitigation in forest management carbon emission reduction. REDD+ developers, parties to the United Nations Framework Convention on Climate Change, define the approach as “reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks”. Developing countries meeting the requirements of REDD+ receive payments for verified emission reductions based on the results they are able to indicate, creating incentives for the countries to invest in forest management. (UN-REDD Programme Fact Sheet, 2016).

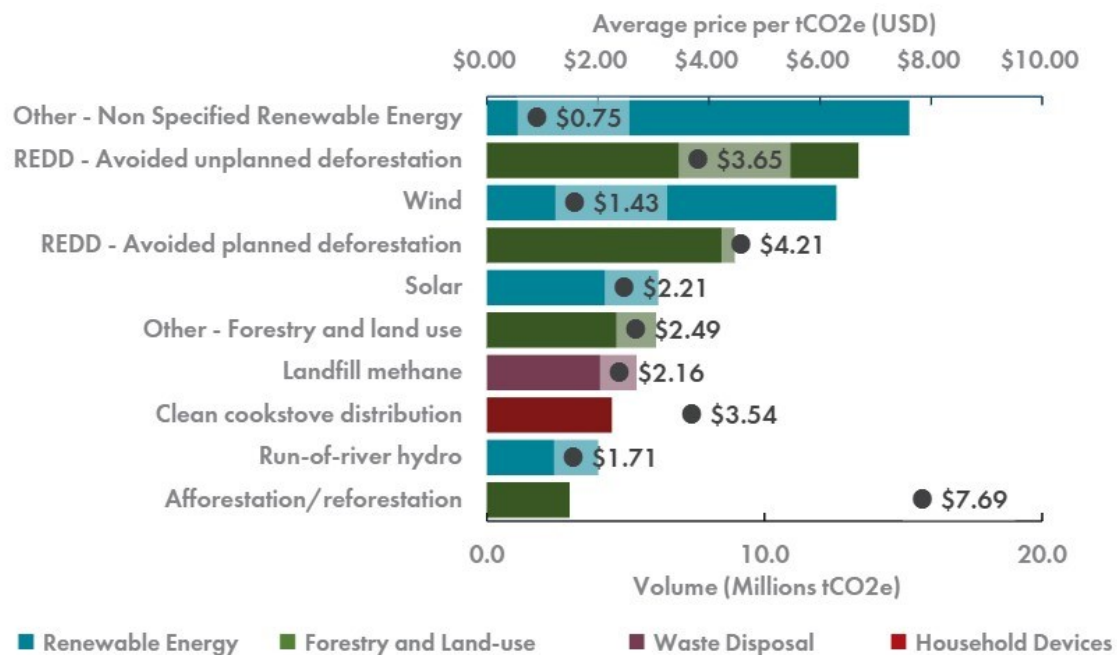


Figure 5 Most transacted offset project type volumes (Forest Trends Ecosystem Marketplace, 2020)

2.4 Competitive advantage

The Cambridge Dictionary (Cambridge University Press, 2021) defines competitive advantage as “The conditions that make a business more successful than the businesses it is competing with, or a particular thing that makes it more successful”. Competitive advantage can be seen as the pursued goal companies in-

tent to reach via competitive strategy, which itself is defined on the basis of competitive environment. Competitive environment is the very basic conditions defined by operators in the specific industry, in which companies conduct their daily operations. Competitive strategy is a tool companies create in order to manage different forces federating the competitive environment. (Porter, 1985). According to Porter (1985), these forces are threat of new competitors, threat of new substitutes, bargaining power of customers, bargaining power of suppliers, and competitive rivalry. With a competitive strategy, a company is potentially able to secure a position in the market, thus gaining competitive advantage over other operators in the same market (Porter, 1985).

Porter's (1985) theory of three generic strategies divides competitive strategies into cost leadership and differentiation, complemented with a focus strategy. The essence of cost leadership strategy is in producing with lower cost than the competitors in a specific market, which requires cost minimization in all parts of company operations. In differentiation strategy, the aim is to gain competitive advantage over competitors by offering a unique product or a service that customers are willing to pay a premium price for. Environmental differentiation is further discussed in chapter 2.4.2. Cost leadership and differentiation are strategies that are in action on industry-wide scope, whereas focus strategy is used when the intention is to focus on a certain segment within the industry. Within the targeted segment, a cost leadership or differentiation strategy is then used to achieve competitive advantage. (Porter, 1985).

2.4.1 Environmental strategies and competitive advantage

Environmental strategies are established in companies essentially in order to mitigate the impact of company's processes on the environment. The strategies are incorporated into production, processes, and policies, including for instance waste and energy reduction, taking environmental management systems into action, and switching to renewable energy. These strategies can be divided into reactive and proactive environmental strategies, out of which reactive strategies often revolve around meeting the bare minimum environmental regulatory requirements, often with end-of-pipe solutions, in order to mitigate the risk of sanctions from polluting. Proactive strategies, on the other hand, comprise of pollution prevention and strengthening environmental capabilities of the company in general. Different stakeholders are also a more viable part of proactive strategies development than in reactive strategies. (Wang et al., 2020).

Environmental strategies do not only target to mitigate the impact of companies' actions on the natural environment, but environmental performance also helps significantly to sustain companies' competitive advantage, as well as lift companies that struggle financially back to compete on the market. Well-executed environmental strategies are, in addition, in line with shareholder's wealth

maximization responsibilities. (Prayag, Han, & Kim, 2017). Wang et al. (2020) furthermore emphasize that it is crucial for companies to improve and develop environmental strategies and environmental responsiveness regarding stakeholder pressure to meet the environmental demands of various external stakeholder groups. Beyond-compliance strategies are policies companies create that exceed the requirements of laws and regulations (Prakash, 2001). Companies create environmental beyond-compliance strategies in order to gain environmental competitive advantage, which can be seen to born from social pressures and economic constraints, and not purely on moral obligation to be in compliance with the law (Gunningham, Kagan & Thornton, 2004).

In order for companies to gain benefits from proactive environmental strategies, the ability to acquire, assimilate, transform, and exploit knowledge is crucial. In an organization, the top management needs to obtain the above-mentioned mindset and skills in order to realize the benefits. For a company to turn proactive environmental strategies into environmental competitive advantage, company's absorptive capacity needs to work efficiently, mediated by the support from top management. (Delmas, Hoffmann, & Kuss, 2011).

2.4.2 Environmental differentiation

Differentiation refers to companies' strategies to offer customers a product or a service, which has a unique feature in it, differentiating it from the rest of the market, thus gaining competitive advantage. A company can differentiate on any aspect of their product or service, whether it be the quality of the materials used in production, durability, cost, or the environmental impact. What is essential in differentiation, is that the cost of the differentiation does not surpass the profits generated by it. (Porter, 1985). Russo (2010) suggests, that even though changes in the value chain often increase the total costs of the product, a company can overturn this by converting additional cost to additional value.

There exist four generic competitive environmental strategies for companies to position themselves and identify where the competitive focus should be aimed at regarding environmental strategies, according to Orsato (2006). The author explains that the framework can be utilized in defining a strategy for a single product or service, and furthermore for a portfolio of products or services. Specific conditions for environmental strategies potentially resulting in competitive advantage can be identified by decoupling the elements in competitive environmental management. However, the divisions are not strict between the strategies. (Orsato, 2006). Figure 6 illustrates the four strategies, which are eco-efficiency, beyond compliance leadership, eco-branding, and environmental cost leadership. First of the strategies, eco-efficiency, is most suitable for companies in need for simultaneously reducing cost and environmental impact of their processes. Companies attending eco-efficiency strategy increase continuously the productivity of their processes, while simultaneously decreasing the environmental impact

and cost regarding said processes. The second strategy, beyond compliance leadership, revolves around marketing the company efforts to increase the efficiency of their processes. Companies attending this strategy are likely willing to pay for beyond compliance measures, even if they would be unprofitable, in order to separate the company from competitors, which would then be marketed to customers in hopes of gaining competitive advantage. The third strategy, eco-branding, means that a company differentiates itself from competitors by offering customers a unique product or a service in terms of attributes instead of low price. The product or service, however, needs to be ecology-oriented and differentiated through environmental attributes. In the final strategy, environmental cost leadership, companies focus on more radical product or service innovation compared to eco-branding. The innovation may include, for instance, completely new materials used in production or dematerialization. (Orsato, 2006).



Figure 6 Generic competitive environmental strategies (Orsato, 2006)

A company can differentiate itself in the market by applying a strategy of environmental differentiation, which is built upon providing a product or a service that has a smaller environmental impact, or better environmental benefits (Schaltegger, Burritt, & Peterson, 2003). A study conducted by Bansal and Roth (2000) investigated companies' reasons to perform greening of their operations and found that ecological responsiveness potentially improved the long-term profitability. Elements of ecological responsiveness included for instance eco-labeling, green marketing, and the development of eco-friendly products. Com-

petitiveness and financial performance act as a motivation in the majority of incentives regarding sustainability (Bansal & Roth, 2000; Porter, 1985), which enables greater focus on innovating less-polluting products and processes. A company may create strategic niche if competitors do not recognize its environmental differentiation as a competitive threat. This indicates that companies that adopt early environmental differentiation strategies may gain unnoticed competitive advantage. (Bansal & Roth, 2000).

2.5 Green marketing

The American Marketing Association (2017) defines marketing as “The activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.” For green marketing, the definition varies between researchers and context. Thus, there is no universal definition for the concept. Environmental marketing, ecological marketing, and eco-marketing are all terms in use, representing the same concept. (Moravcikova, Krizanova, Kliestikova, & Rypakova, 2017; Nadanyiova et al., 2020). It is, thus, in the domain of the company to create their own definition for the term “green marketing” on the foundation of their goals, risks and opportunities, and capabilities (Moravcikova et al., 2017). As mentioned, there are multiple definitions for the term “green marketing”, but for the context of this thesis, the most suitable definition is presented by McDaniel and Rylander (1993), as they define green marketing as companies analyzing consumer behavior and political attitudes while recognizing companies’ part in environmental protection. The authors continue to explain that companies need to recognize the necessity of green marketing being fully incorporated into company’s marketing plan and recognize that the action of green marketing is not purely altruistic.

The trend of companies attending CSR is growing almost globally, which increases the momentum of green marketing approaches as well (Moravcikova et al., 2017; Nadanyiova et al., 2020). Nadanyiova et al. (2020) emphasize that CSR activities need a communication channel to reach and influence target groups and stakeholders, to which green marketing is an efficient tool. Green marketing also acts as a tool when company seeks to gain competitive advantage, in which case environmental mindset needs to be incorporated into all parts of company’s marketing strategy. Green marketing strategy implementation enables companies to potentially gain higher profitability, competitive advantage, improved stakeholder relations, and better environmental performance. (Moravcikova et al., 2017).

As the interest in environmentally friendly products increases, increases also the interest in green marketing to promote their products and services for companies that use environmental differentiation as a strategy for gaining competitive advantage. Nadanyiova et al. (2020) indicate that brands engaging in

green marketing gain competitive advantage on competitors that do not pay attention to sustainability. As environmental protection is clearly a growing trend among consumers, companies are introducing methods to meet the demand, for instance by compensating the emissions on certain sections of their value chain. Young adults (millennials and post-millennials) are the single largest target group for environmentally differentiating brands, and both of the above-mentioned age groups consider green marketing to be crucial in communicating environmental values and in increasing brand value. (Nadanyiova et al., 2020). The same phenomena can be seen outside of Europe as well, as Maziriri (2020) discovered green packaging and green marketing to have positive effect on competitive advantage and financial performance on SME businesses in South-Africa. Green marketing depends, however, largely on the target group, as Moravcikova et al. (2017) found in their research on green marketing in the automotive industry: "We concluded that there is no comprehensive green marketing implementation model linking environmental consumer behavior with a link to the company's marketing strategy."

3 DATA AND METHODOLOGY

3.1 Research method

Qualitative and quantitative research methods tend to be thought of as two different cultures in the research community, as both of them have their distinctive values, beliefs, and norms. However, even though qualitative and quantitative research methods have major differences, and the culture around them in the research community can be seen to function against each other, the primary function in both is the same. Even with different methods for gathering and interpreting data, the aim is to give insights and answers in regard to the specific research problem or question. (Mahoney & Goertz, 2006).

Quantitative research focuses on statistics and explaining phenomena by following the effects-of-causes approach harnessed in experimental research cases. Quantitative research also aims to reproduce the outcome of a controlled experiment in the context of specific research case. (Mahoney & Goertz, 2006). Qualitative research method, on the other hand, is used most in context of humans and their interactions in naturally occurring circumstances. Qualitative method may be utilized, for instance, in a situation where the researcher is aiming to gain deeper knowledge on how people perceive a certain phenomenon. (Lichtman, 2017). Creswell (2009) explains that quantitative research tends to deal with number, whereas qualitative research revolves around words. Furthermore, quantitative research tends to have a set of predetermined options for answers, whereas in qualitative research the data is collected with greater flexibility in terms of answers, such as interviews (Creswell, 2009).

As the data for this study is gathered via an online survey, the research can be identified to follow the quantitative research method. Within this thesis, no interviews took place, nor were any set of existing documents browsed in order to gather data. A quantitative method utilizing a survey approach was selected for this thesis because the aim was to get as comprehensive sampling of Finnish companies as possible. By conducting a survey, the researcher is able to gather numeric data from a chosen sample representing a piece of population, and furthermore create statements on the entire population by generalizing the data collected from the sample. Furthermore, when quantitative research is concerned, the survey method is one of the most common ways to conduct a study. (Creswell, 2009; Gable, 1994). All the above-mentioned proves and justifies the quantitative method selection for this study, rather than a qualitative approach.

The survey approach includes methods that emphasize quantitative analysis and statistical techniques to interpret the gathered information, which will be discussed in chapter 3.4. Different methods include for instance various types of questionnaires, phone interviews, and pre-published statistics. (Gable, 1994).

For this thesis, an online questionnaire was selected to be the method for conducting the survey. Regarding online surveys, e-mail contacting is the most used method of approaching the participants due to its low cost and fast delivery times. However, this method of invitation is challenged for instance by the increasing popularity of spam filtering programs. (Fan & Yan, 2009).

3.2 The questionnaire

As mentioned in the previous chapter, a questionnaire is a method used in a survey research in order to collect information, which is then analysed utilizing statistical techniques (Gable, 1994). In a questionnaire, participants answer a predefined set of questions designed by the researcher. It is extremely important for the researcher to indicate the purpose of the questionnaire clearly to the potential participants, as well as to design the questionnaire to be as appealing as possible, to maximise the response rate. Furthermore, the execution itself needs to be well conducted and pilots should be run before sending out the invitations. (Saunders, Lewis, & Thornhill, 2007).

The questionnaire for this thesis was conducted in cooperation with the case company, as it is important that the company gains as much knowledge on their clients as possible, for instance in terms of carbon neutrality strategies and willingness to pay for a premium carbon neutral transportation service. Some of the questions were received directly from the company, but the majority were formulated to gain information regarding the posed research questions. The process of designing the questions began already in the first meeting with the case company by briefly discussing their intentions and wishes regarding the information they wish to gain from the survey. An online questionnaire building program *Webropol 3.0* was selected to act as the platform on which the questionnaire was built on. The questionnaire was created both in Finnish and in English in case some of the participants did not speak Finnish. The participants were able to switch the language at any point of the questionnaire.

After the first draft of the questionnaire was created, it was tested and approved by the case company in terms of the content and display. Minor modifications were then made before sending out the invitations via e-mail using a contact detail list provided by the case company. The company provided a temporary e-mail address to be used when sending the invitations, which should maximize the response rate. This was based on the assumption that potential participants will enter the questionnaire more probably if they immediately recognize the invitation sender to cooperate with the company. An invitation text was attached to each e-mail invitation providing information on the purpose of the questionnaire, as well as details such as the approximate duration to complete survey and contact details in case the potential participants needed any advice regarding the questionnaire. The invitation letter can be found in Appendix 1. To

maximize the response rate, participants were promised a brief summary on the overall results of the survey, on which they were able to compare their answers on the final results. The summary is conducted by the case company based on the research findings chapter of this thesis. They will also handle the distribution of the summary to the participants. In practice this means that the company publishes the summary online and sends a link to all the participants.

The questionnaire can be found in Appendix 2. The questions were formulated to indicate participants' opinions on different issues as precisely as possible. The participants were asked, for instance, to indicate whether they agree or disagree with certain statements. The most common question type in the questionnaire utilized a 6-point Likert scale, which enables participants to indicate how much they agree or disagree with the given statement (McLeod, 2019). Other question types included, for instance, lists of options, from which the participants were asked to select the options, which match their company's actions. As previously explained, some of the questions were aimed directly to provide the case company with information about their clients' attitudes towards carbon offsetting, whereas other questions were aimed to gain information to the research questions on this thesis.

The original invitation e-mails to potential participants were sent on 15.4.2021 with the deadline for completing the questionnaire on 23.4. A reminder message was sent on 21.4. to all the companies that had not yet completed the questionnaire, by which time a total of 20 participants had done so. As the response rate remained relatively low on the date of the original deadline with 40 completions, a second reminder message was sent on 26.4. and the deadline to complete the questionnaire was postponed to 30.4. A final reminder was sent to potential participants yet to complete the questionnaire on 28.4. to maximize the response rate, as the questionnaire had been answered by 49 participants by then. Fan and Yan (2009) illustrate experimental studies to have indicated, that by sending reminders, the response rate of the survey may even double. The authors also emphasize, that the effect of reminders may, on the other hand, be very modest in terms of enhancing the response rate.

As the list of potential participants provided by the case company was not tidied up, there is a great chance of invitations directed to spam folders or blocked completely by the respondents' e-mail software. Fan and Yan (2009) explain that the increasing amount of unwanted e-mail has forced the spam-blocking software to develop more aggressive measures to block messages perceived as spam. Spam-blocking software may identify e-mails as spam if, for instance, the list of receivers includes outdated e-mail addresses (Fan & Yan, 2009), which was in fact a present issue when sending the invitations in this study.

3.3 Participants

The contact detail list, upon which the sent invitations were based on, had more than 1200 e-mail addresses and included many outdated addresses resulting in more than 300 automatic replies stating failed delivery. The list also contained several employees representing the same company, which in itself was not a problem since the invitation got a better coverage within the organizations, possibly better reaching a suitable employee to complete the questionnaire. Overall, 202 potential participants opened the online questionnaire, and 60 completed it until the deadline. A total of 96 participants began to answer the questions but did not finish the questionnaire. As the case company did not wish the exact number of their clients to be published, the response rate cannot be discussed.

As previously mentioned, all participants were companies located in Finland, and purchase import and export transportation services from the case company. In addition, none of the participants in this survey deal in bulk, meaning goods that are not packed in any container and are dealt with in large quantities, such as timber or grains. In the beginning of the questionnaire, participants were asked to select whether their company operates mainly on b2b or b2c sales, to gain knowledge whether it has an influence on attitudes towards gaining added value from compensation. In addition, participants were asked to provide general information of the company they represent. Many participants had a managerial position in their organization. For instance, logistics, procurement, sustainability, and financial managers were among the participants that completed the questionnaire. The industries in which the participant companies operated were, for example, machinery, shipbuilding, furniture manufacturing, metal industry, technology, and food industry.

3.4 Data analysis

As previously explained, the data for this thesis was collected by conducting an online survey with *Webropol 3.0*. After the questionnaire deadline had expired and the questionnaire link had been closed, the process of analyzing the data could begin. To analyze the survey results, *Webropol Insights*, *Webropol Professional Statistics* expansion, and *Microsoft Excel* were used.

Simple statistical results could be gathered directly from Webropol, for instance in terms of means and standard deviations for questions that utilized the Likert scale. Standard deviation refers to the amount of dispersion within the presented answers. If the answers are close to the mean, the standard deviation is low, whereas if the given answers are spread further from the mean, the standard deviation is high. (Bland & Altman, 1996). Another typical data analyzation method is to define the skewness for a dataset, which indicates the symmetry of

the results in terms of how the answers are distributed compared to the mean (McNeese, 2008). However, as McNeese (2008) demonstrates with an example, the skewness of some dataset is highly altered if the sample is too small. As only 60 participants completed the questionnaire, skewness is excluded when the results are examined.

All results from questions containing a Likert scale needed to be transferred into Excel in order to format them to be more easily interpreted. A 6-point Likert scale was selected, in which 0=completely disagree, 1=disagree, 2=slightly disagree, 3=slightly agree, 4=agree, and 5=completely agree. The participants used a slider to indicate their standpoint on a given statement. A 6-point Likert scale eliminates the possibility for the participants to choose the neutral option, which is present, for instance, in 5-point scales and forces them to think more about their opinion on the presented subject. The scale has options near neutral, which still indicate a slight agreement or disagreement on the subject. (Chomeya, 2010).

In order to perform crosstabulation and chi-square tests, Webropol Professional Statistics expansion was used. Crosstabulation is used to determine possible correlations between two variables (Statistics LibreTexts, 2020). To gain knowledge on the statistical significance of the correlations presented in crosstabulation, a Pearson's chi-square test can be applied. The test indicates whether a result is statistically significant by presenting a p-value. If $p > 0.05$, the results cannot be considered statistically significant. (Davies, 2007). There are also different levels of statistical significances, which are generally divided into three categories. The above-mentioned categories are statistically somewhat significant ($p < 0.05$), statistically significant ($p < 0.01$), and statistically highly significant ($p < 0.001$). (Holopainen & Pulkkinen, 2008). Webropol Professional Statistics expressed the significances with asterisks, as in * indicating $p < 0.05$, ** indicating $p < 0.01$, and *** indicating $p < 0.001$.

4 RESEARCH FINDINGS

The results of the survey are presented in this chapter. First, the background information will be presented in chapter 4.1 regarding views and actions in terms of sustainability and offsetting, provided by the participants. After that, in chapters 4.2 and 4.3, the questionnaire answers will be reflected to the research questions, are presented. The latter chapters illustrate how companies view carbon neutral transportation in terms of added value, and how the offset project type influences the willingness to purchase carbon neutral transportation service.

4.1 Basic information regarding sustainability

In the beginning of the questionnaire, participants were asked whether their company is mainly engaged in b2b or b2c sales. The intention was to compare these two groups between each other, but as 95 percent of the participants identified their company as b2b companies and only 5 percent as b2c companies, this approach had to be dismissed. As the number of respondents turned out to be 60, it is furthermore not meaningful to compare, for instance, different industries, geographical locations, or participants' positions in their company between each other.

There were several text fields providing information about a certain topic within the questionnaire, as the assumption was, that there would be participants who had no prior knowledge on the topic of carbon offsetting. Furthermore, the aim was to elaborate certain questions also for participants with some prior knowledge on the topic. This was beneficial, as the answers to the question "How familiar are you with the concept of carbon offsetting?" indicate in Figure 7.

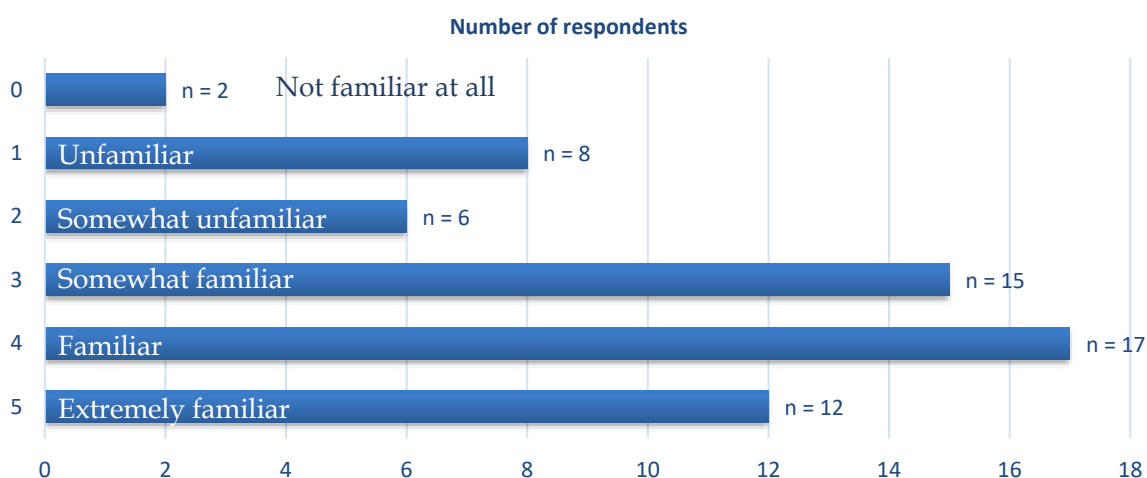


Figure 7 How familiar are you with the concept of carbon offsetting

The scale was presented with a slider (see Appendix 2), and the options between the far-ends were not described in further detail. In total, 73.33 percent of the participants expressed to be at least somewhat familiar (options 3-5) with the concept, whereas 26.66 percent felt that they are at best somewhat unfamiliar (options 0-2) with the topic. However, only 2 respondents chose the answer “not familiar at all”.

Next, the participants were asked to identify whether their company had compensated emissions on any part of their company’s operations. A set of options were presented with four possible answers on each: “Yes, No, Cannot tell, and Do not want to answer”. The distribution of answers is presented in Table 1.

Table 1 Prior emission compensations

	Yes	No	Cannot tell	Do not want to answer
Production/manufacturing	23.3%	60.0%	16.7%	0.0%
Transportation/distribution	31.7%	46.6%	21.7%	0.0%
Facilities	18.3%	56.7%	23.3%	1.7%
Sourcing	13.3%	56.7%	28.3%	1.7%
Sales/marketing	8.3%	61.7%	30.0%	0.0%
Warehouse operations	10.0%	60.0%	28.3%	1.7%
Other, what?	9.5%	47.6%	33.4%	9.5%

In total, 53.3 percent of the participants chose “No” or “Cannot tell” in every category. The most compensated category was transportation/distribution, which 31.7 percent of the participants told to have compensated. The second most popular compensation category was production/manufacturing, with 23.3 percent of the participants selecting it. The participants were somewhat unfamiliar with the compensation actions their company has taken, as the average percentage for the answer “Cannot tell” was 25.96. The category of “Other, what?” included an open text field where participants were asked to indicate what other parts of their company’s operations had been compensated, to which business travel was answered two times.

In comparison to prior compensation measures, other sustainability related actions were much more commonly implemented in the companies, as illustrated in Table 2. Many of the sustainability actions clearly enhance the profitability of the companies, which may explain the popularity. The most frequently introduced sustainability related measure between the companies was enhanced recycling, with 88.3 percent of respondents selecting it. Other popular measures were heavily related to production and logistics as 76.7 percent of the participants answered positively on logistics optimization, and over 60 percent illustrated that sustainability actions had been introduced in waste and resource efficiency, production processes optimization, and sustainable sourcing improvement. 10 participants indicated that other actions had been introduced as

well, but only two answers were elaborated to an open text field. It is worth noting, that every participant, except for one, chose at least one sustainability action from the list, which had been introduced in their company within the past five years.

Table 2 Sustainability actions introduced in the past five years

	Yes	No	Cannot tell	Do not want to answer
Paperless office	33.3%	56.7%	10.0%	0.0%
Enhanced recycling	88.3%	6.7%	5.0%	0.0%
Reduced use of plastics	56.6%	31.7%	11.7%	0.0%
Waste reduction in manufacturing/Improved resource efficiency	66.7%	20.0%	13.3%	0.0%
Limiting business travel (prior to COVID-19)	36.7%	40.0%	23.3%	0.0%
Optimizing production processes	63.3%	25.0%	11.7%	0.0%
Optimizing logistics	76.7%	15.0%	8.3%	0.0%
Improving the sustainability of sourcing	61.7%	21.7%	16.6%	0.0%
Introducing environmental management systems	46.7%	33.3%	20.0%	0.0%
Other, what?	16.7%	25.0%	58.3%	0.0%

The most frequently introduced sustainability related measure between the companies was enhanced recycling, with 88.3 percent of respondents selecting it. Other popular measures were heavily related to production and logistics as 76.7 percent of the participants answered positively on logistics optimization, and over 60 percent illustrated that sustainability actions had been introduced in waste and resource efficiency, production processes optimization, and sustainable sourcing improvement. 10 participants indicated that other actions had been introduced as well, but only two answers were elaborated to an open text field. It is worth noting, that every participant, except for one, chose at least one sustainability action from the list, which had been introduced in their company within the past five years.

The participants were asked next whether their companies have set a goal for becoming carbon neutral, to which the majority answered negatively. Merely 16.6 percent indicated that said goals have been set, as presented in Table 3. Between the companies that have pledged achieving carbon neutrality, the answers to the question on when the goal is set to be achieved varied greatly. The range of when carbon neutrality ought to be achieved was from 2022 to 2050, with no single time-period more favoured than the others.

Table 3 Do companies have schedules for becoming carbon neutral

	n	Percent
Yes	10	16.6%
No	31	51.7%
Cannot tell	18	30.0%
Do not want to answer	1	1.7%

The companies indicating carbon neutrality goals were compared to the answers given to the question about whether companies have compensated emissions from any part of their operations (Table 4). Cross tabulation was performed between the two questions, which revealed that 60 percent of the companies with carbon neutrality goals have also compensated emissions generated in production/manufacturing. A chi-square test was performed to test the statistical significance of the result, indicating that the above-mentioned correlation was statistically significant ($p < 0.01$). 40 percent of the participants, whose company has a carbon neutrality goal, expressed that their company has compensated transportation emissions. However, the above-mentioned finding cannot necessarily be considered statistically significant, as $p > 0.05$. Crosstabulation also revealed, that 30 percent of the companies with set carbon neutrality goals had also compensated emissions from sales/marketing ($p < 0.01$). In addition, statistically somewhat significant ($p < 0.05$) correlation was detected between companies, that have compensated emissions from production/manufacturing, without a carbon neutrality goal set, as 13 percent of these companies selected the option.

Table 4 Percentage of companies with carbon neutrality goal expressing compensation measures in different parts of their operations

	%
Production/manufacturing	60
Transportation/distribution	40
Facilities	40
Sourcing	30
Sales/marketing	30
Warehouse operations	20
Other, what?	0

These results indicate that there are desires to compensate emissions from different parts of company operations, at least with the companies who have set a goal of becoming carbon neutral. This does not, however, indicate whether companies were interested in compensation to achieve general carbon neutrality, or if they saw that compensation would bring added value to their brand or products. This question will be addressed in the next chapter.

4.2 Carbon neutral transportation as a part of company's strategies

The questions examined in this chapter were all constructed utilizing the Likert scale with a slider (see Appendix 2), except for the last question, in which companies were asked to indicate whether they would be interested in purchasing carbon neutral transportation services. The participants were first asked whether they agree or disagree with a statement, that a certificate indicating carbon neutral transportation would bring added value to their company's brand or product (Figure 8). A total of 54 participants answered the question, meaning that 6 participants did not know their company's view on the matter, thus choosing the option "Cannot tell".

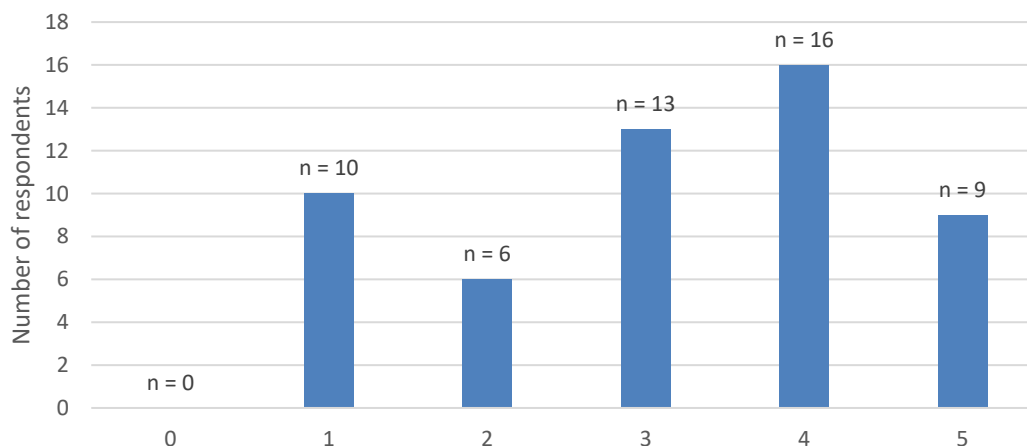


Figure 8 A certificate indicating carbon neutral transportation would bring added value to company's brand or product

The answers to this question were somewhat evenly distributed, however slightly leaning towards the complying side with a mean of 3.1 on a scale from 0 to 5. Nearly half (46.3 percent) of the respondents indicated to either completely agree, or agree, with the statement. It is worth noticing, that none of the answers indicated that a respondent completely disagrees with the statement. Furthermore, the answers had a standard deviation of 1.4.

Next, the participants were asked to express their views on whether carbon neutral transportation could be used in their company's marketing strategy. The question resembles the previous question in a sense that both aim to attain information about the marketing perspective of transportation compensation within the companies possibly purchasing the service. Thus, the answers were similarly distributed, as can be seen from Figure 9. A total of 53 participants indicated their views on this statement.

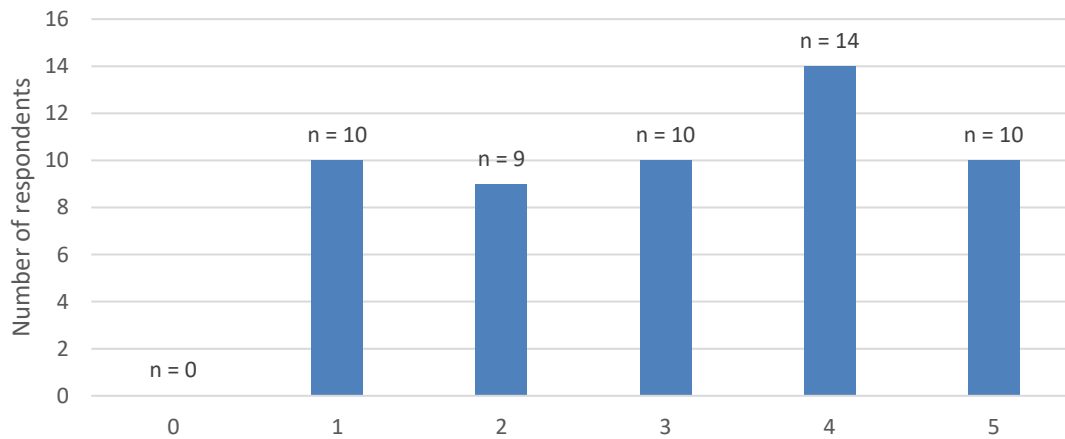


Figure 9 Carbon neutral transportation as a part of company's marketing strategy

Once again, the mean for the answers was 3.1 with a standard deviation of 1.4. Not a single participant chose to completely disagree with the statement, which indicates that companies see, at least to some extent, potential in infusing carbon neutral transportation into their marketing strategy. Otherwise, the answers were relatively evenly distributed, with each option getting 17 to 19 percent of the answers, but the option to agree was selected by around every fourth participant.

The questions continued to revolve around marketing potential of carbon neutral transportation, as the participants were asked next whether they see that ecological pro-activeness potentially improves the long-term profitability of a company, for example, in terms of eco-labeling. A total of 51 respondents indicated their view on the statement with the mean of answers being in harmony with the previous statements at 3.2. The standard deviation for the answers was 1.5. More than half of the respondents stated that they either completely agree, or agree, with the statement, as seen in Figure 10. Around every fifth respondent considered ecological pro-activeness to barely improve company's profitability in a long run, yet only one respondent saw no potential in improving the profitability.

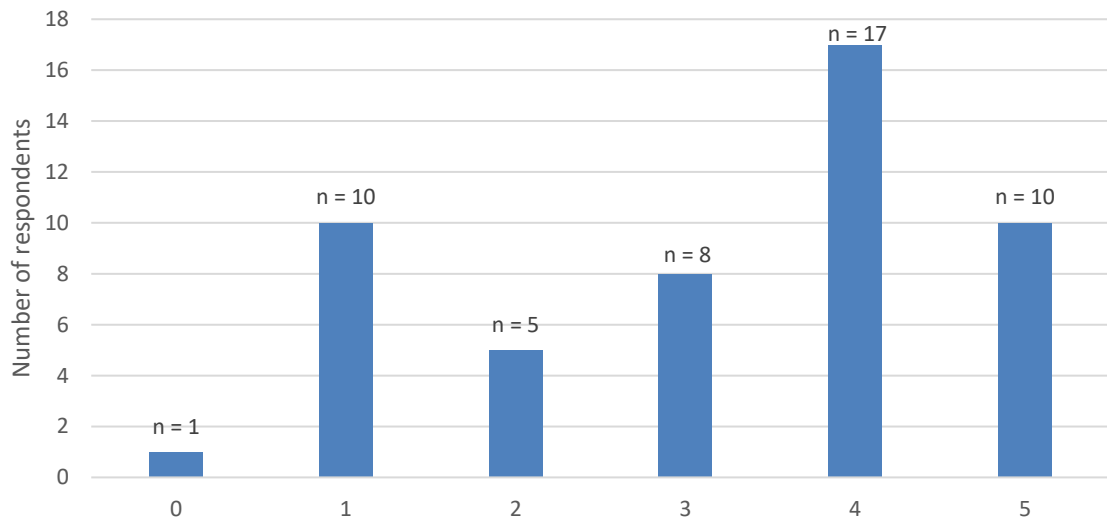


Figure 10 Ecological pro-activeness potentially improves the long-term profitability of a company

Brief explanations on the definitions of VCM and CDM were presented before the next question. The assumption was, that the terminology is unclear for most of the participants, which can be clearly seen from the response rate in the next question regarding whether the participants saw, that carbon credits purchased from voluntary carbon market are more beneficial for a company than regulatory offsetting (Figure 11). Only 20 participants were able to indicate on how much they agree or disagree with the statement, meaning that 40 participants selected "Cannot tell".

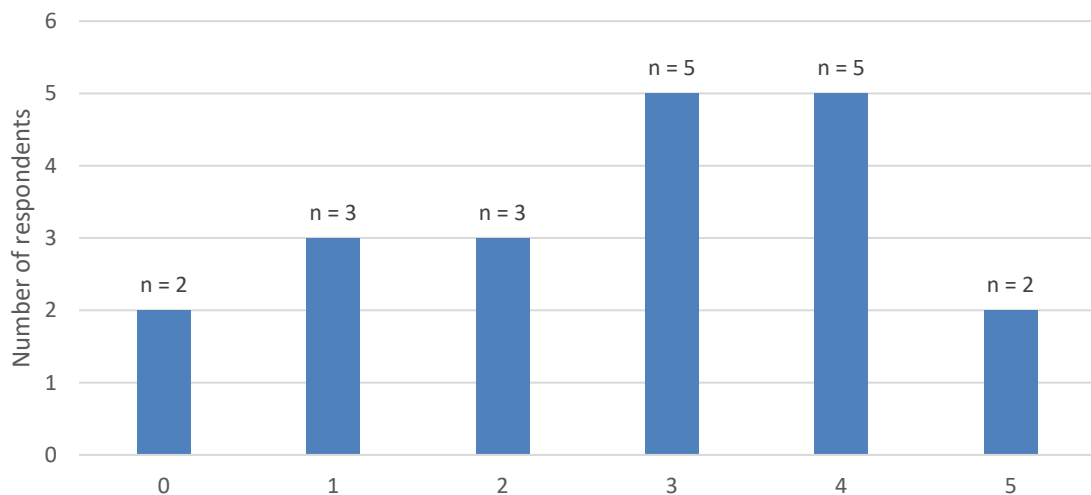


Figure 11 Carbon credits purchased from voluntary carbon market are more beneficial for a company than regulatory offsetting

The answers provided were evenly distributed throughout the scale, with a mean of 2.7 and standard deviation at 1.5. It is possible, that the answer rate would have been higher, been the question presented in another form. Also, a more thorough explanation of the differences between VCM and CDM could have potentially resulted in a higher answer rate.

The final question utilizing Likert scale in this section addressed the incorporation of carbon neutral transportation into companies' sustainability strategies. The results are presented in Figure 12. The question received 53 answers and is closely related to a prior question regarding carbon neutral transportation as a part of companies' marketing strategies, but the scope of utilization possibilities is wider.

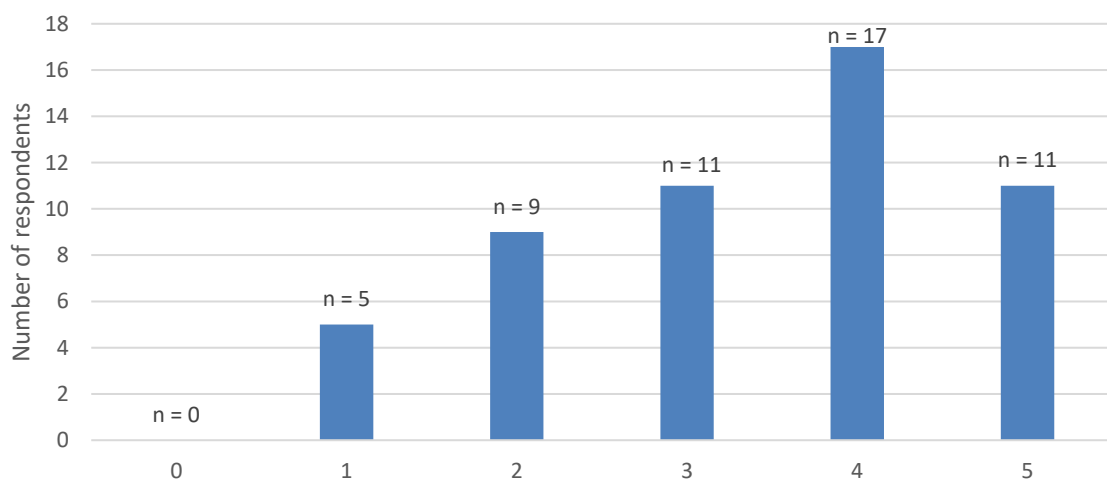


Figure 12 Carbon neutral transportation as a potential piece of companies' sustainability strategies

Similarly to previous questions concerning the incorporation of carbon neutral transportation into company strategies and actions, none of the participants indicated, that they completely disagree with the statement. Carbon neutral transportation was seen to have high potential to be a part of companies' sustainability strategy, as the mean for the answers was the highest so far at 3.4, with a standard deviation of 1.3. More than half of the respondents (52.83 percent) indicated to either completely agree, or agree, with the statement. As the means of answers regarding questions on the attitudes of incorporating carbon neutral transportation into company strategies and actions were all on the agreeing end of the Likert scale, the potential for companies desiring such services is noticeable.

The participants were asked next whether they would be interested in paying for a premium service in carbon neutral transportation. The different options presented to participants, as well as the answer percentages, are visible in Table 5. The participants were additionally asked to elaborate their opinion to an open text field. Participants who answered "yes" were asked to present an optimum price for the service. The consensus was, that the price for the premium

service should not be significantly higher than the price of the regular transportation service. Participants answering “no” were, on the other hand, asked to elaborate why the service is not appealing, and the most common statement was, that the price point is the key factor when purchasing logistics services and they do not wish to pay for an extra service.

Table 5 Companies’ interest in paying for carbon neutral transportation

	n	Percent
Yes	23	38.3%
No	7	11.7%
Cannot tell	26	43.3%
Do not want to answer	4	6.7%

Two opinions clearly stand out, as 38.3 percent of the participants answered “yes”, and 43.4 percent “cannot tell”. The percentage of favourable answers is only slightly less than the answers indicating complete agreement, or nearly complete agreement, on statements presented in Figure 8 (46.30%), Figure 9 (45.29%), Figure 10 (52.94%), and Figure 12 (52.83%). The above-mentioned statements all revolved around the potential benefits carbon neutral transportation could bring to the participants’ companies. The high percentage on the option “cannot tell” may be explained by the variety of participants’ positions in their company, as a person working, for instance, as an export coordinator is presumably not fit to answer questions regarding company’s service purchasing.

Reflecting on the above-mentioned, it is clear, that companies would in general be interested in carbon neutral transportation services. By using crosstabulations to investigate the correlation between participants answering yes to the question presented in Table 5, and participants who told their company has already compensated emissions in some part of their operations, a statistically significant correlation was found regarding compensation in sales/marketing, with 17 percent of the participants answering “yes” to both ($p < 0.01$). Table 6 illustrates the percentages of participants indicating interest in purchasing carbon neutral transportation services in regards of previously compensating emissions in parts of their operations.

Table 6 Percentage of companies interested in carbon neutral transportation service expressing compensation measures in different parts of their operations

	%
Production/manufacturing	35
Transportation/distribution	39
Facilities	30
Sourcing	22
Sales/marketing	17
Warehouse operations	13
Other, what?	25

39 percent of the companies interested in the premium service had already compensated their transportation emissions in the past. Furthermore, 35 percent had compensated production/manufacturing-related emissions, and 30 percent facilities-related emissions.

4.3 Factors influencing the compensation purchase decision

In this chapter, the focus is in finding out whether the compensation purchase decisions are affected by the compensation project type. In addition, general opinions on different compensation types are examined, as well as other factors potentially affecting the companies when choosing to offset, or not to offset, transportation emissions. Once again, every question except for one, was carried out by using the Likert scale with a slider to express how much the participants agree, or disagree, with a given statement.

Before presenting the next question, examples of different offset project types were introduced to the participants. The assumption was, that some of the participants did not know which types of projects can be included in the process of emission compensation. After the brief presentation of different project type examples, the participants were asked to indicate whether on their opinion a company should have an influence on the offset project type when paying for compensation (Figure 13). A total of 53 participants answered the question and 7 chose the option "cannot tell".

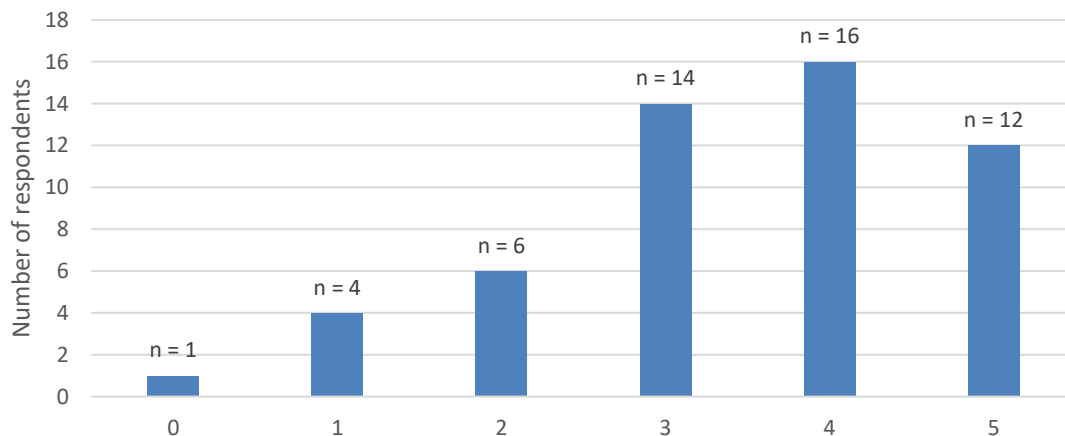


Figure 13 Companies should have an influence on the offset project type when paying for compensation

The respondents strongly believed that companies paying for compensation should be able to influence which types of compensation projects are funded, which a mean of 3.4 with a standard deviation of 1.3 indicates. Nearly 80 percent of the answers were placed on the positive end of the Likert scale (options 3-5), and more than half of the respondents expressed to either completely agree, or agree, with the statement.

Next, the influence of the offset project type was closer examined, as the participants were asked whether the offset project type has an influence on the compensation purchase decision, to see how much the freedom of choice, or lack of it, affects the opinions. The results presented in Figure 14 indicate similarity when compared to the results presented in Figure 13, however, with slightly less agreement. The question was answer by 51 participants.

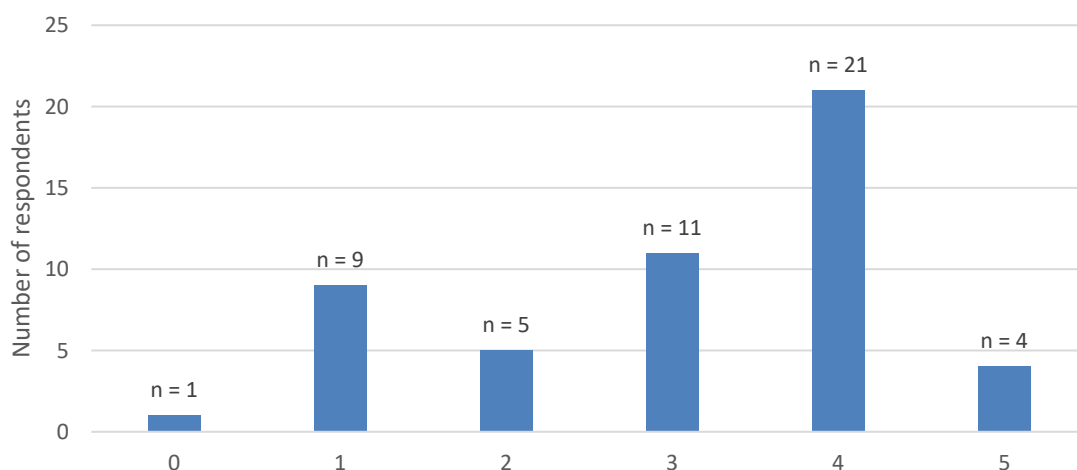


Figure 14 The offset project type has an influence on the compensation purchase decision

70.59 percent of the respondents indicated to, at least somewhat, agree with the statement. The mean of answers was 3.1 with a standard deviation of 1.3. In addition, 41.18 percent of the respondents either completely agreed, or agreed, with the statement. The results of the two previous questions indicate, that the companies see substantial differences between different offset project types in terms of attractiveness and the effects they have on the willingness to compensate.

The next aim was to closer examine which offset project types the participants perceive as most attractive or interesting. The participants were asked to choose three project types from a list provided for them (Table 7). Also, an option "other, what?" was included in case the participants would prefer a project type not present in the list.

Table 7 The attractiveness of different offset project types

	n	Percent
Investing in renewable energy	33	55.0%
Projects on energy efficiency	32	53.3%
Improved forest management	14	23.3%
Forest protection	14	23.3%
Forestation projects	14	23.3%
Destruction of industrial pollutants or agricultural by-products	16	26.7%
Destruction of landfill methane	4	6.7%
Transportation efficiency improvement	26	43.3%
Water security projects	24	40.0%
Other, what?	3	5.0%

Offset project types linked to the energy sector were the most popular choices among the participants, as 55.0 percent indicated renewable energy investments, and 53.3 percent projects on energy efficiency, to be among the three most interesting project types. After energy-related project types, most popular options were transportation efficiency improvement, which was selected by 43.4 percent of the participants, and water security projects, with a 40.0 percent selection rate. Clearly the least interesting project type was destruction of landfill methane, with only 4 participants selecting the option. The rest of the ready-provided options received 23.3 to 26.7 percent selection rates. "Other, what?" was selected by three participants, who elaborated nuclear energy, plastic removal from the sea, and biodiversity projects to be within the most interesting offset project types.

Correlations between participants, who indicated their company to be interested in purchasing carbon neutral transportation services, and selections of

the most interesting offset project types, were examined utilizing crosstabulation. 43 percent of the participants interested in purchasing the service selected forest protection to be among the most interesting offset project types. The correlation is statistically significant as $p < 0.01$. Other meaningful correlations were apparent with water security projects (48%), Projects on energy efficiency (48%), Investing in renewable energy (39%), and Transportation efficiency improvement (39%). However, the above-mentioned findings are not necessarily statistically significant, as $p > 0.05$.

Finally, other factors affecting the offset decisions were examined when the participants were asked if the mode of transport, or the amount of purchased transportation services, affect the decision to offset emissions. 49 participants indicated their opinion on whether the mode of transport affects the decision to offset emissions (Figure 15).

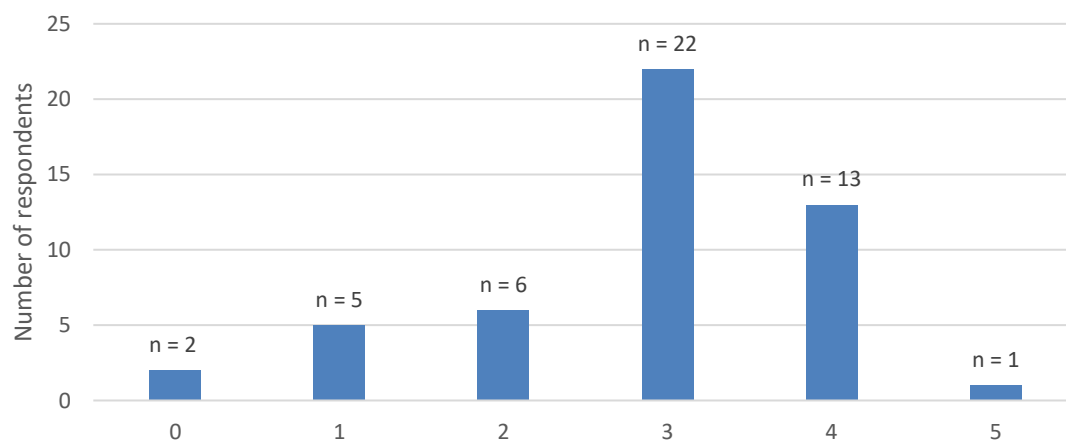


Figure 15 The mode of transport affects the decision to offset emissions

According to participants, the mode of transport has a slight influence on offset decision, as the mean of the answers was 2.9 with a standard deviation of 1.1. The slight inferentiality can be also seen from the percentage of answers on the option of “slightly agree” with 44.9 percent of participants selecting it. In addition, 26.5 percent of the respondents indicated to agree with the statement. The results were similar as to when the participants were asked whether the amount of purchased transportation services affects the offset decision (Figure 16), to which 50 participants answered.

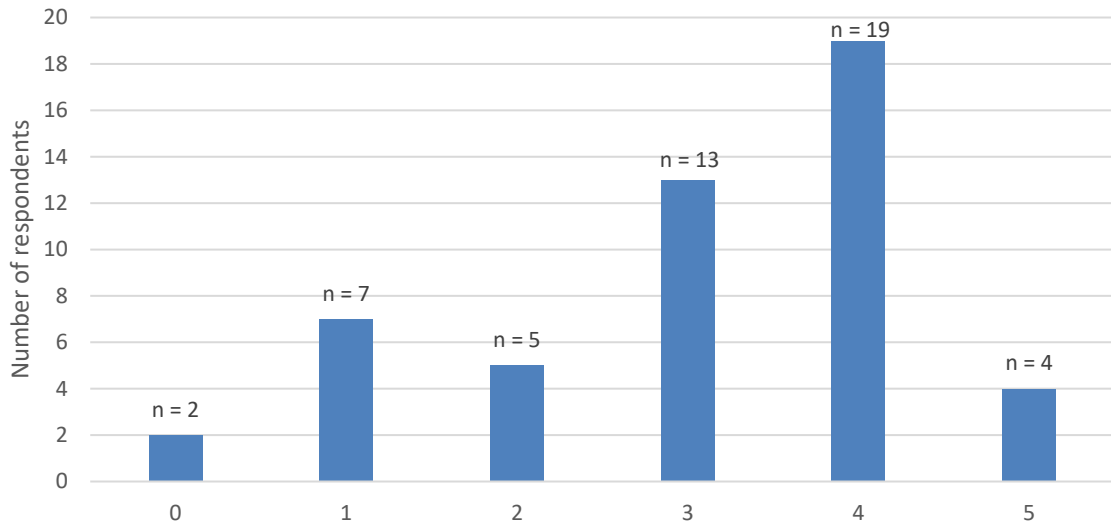


Figure 16 The amount of purchased transportation services affects the offset decision

The participants agreed slightly more with this statement, than the previous one, as the mean of answers was 3.0 with a standard deviation of 1.1. The most selected options were “slightly agree” with 26 percent of the answers, and “agree” with 38 percent of the total answers. It can be thus said that the amount of purchased transportation services does affect the offset decision. However, the result does not elaborate whether participants’ willingness to compensate transportation emissions is lower when the amount of purchased services is low, or if the willingness to compensate emissions is lower when the amount of purchased services is high.

5 DISCUSSION

In this chapter, the results of the survey are discussed and reflected to the theoretical framework presented in chapter 2. The discussion will follow the same order in which the results were analysed, beginning with background information regarding views and actions in terms of sustainability and offsetting, provided by the participants. Then, views on whether companies would gain added value on their brand or product by offsetting transportation emissions is discussed. Next, factors influencing compensation purchase decisions will be examined. Finally, the reliability and validity will be discussed, and potential future research topics are suggested.

5.1 Sustainability measures taken by the companies

It is relevant to first examine sustainability measures carried out by the companies in order to understand the context of the answers given by the participants in latter sections of the questionnaire. 73.3 percent of the participants were at least somewhat familiar with the concept of carbon offsetting, which has undeniably become a trending topic for both individuals and companies. The trend is globally acknowledgeable, as the VCM research by Forest Trends Ecosystem Marketplace (2020) indicates: issuances and retirements of carbon credits have steadily increased in the last four years.

When asking whether companies themselves have compensated emissions, the results indicate 31.7 percent of the participating companies having previously compensated emissions related to freight transportation and distribution. In addition, 23.3 percent of the participants indicated having compensated emissions related to production and manufacturing. The above-mentioned percentages can be considered surprisingly high, but the benefits companies may gain by compensating is supported by literature. By compensating emissions, companies are likely to gain high social and economic benefits (Lin & Lin, 2015), and participants may have been affected by environmental pressure from different stakeholder groups (Andonova & Sun, 2019) leading to the compensation decision. Fourth of the participants were, however, incapable to tell if their company had compensated emissions in the past. Around 30 percent of the participants were not in a managerial position in their organization, which could explain the ignorance on the topic, as a study by Brunton, Eweje, and Tasking (2017) found out that managers are often struggling to effectively communicate CSR initiatives to employees. Also, the managers participating in this survey represented variety of departments, which may result in being unaware of compensation actions performed by their company.

Companies participating in the survey indicated having introduced other sustainability measures besides compensation fairly abundantly in the last five years. 88.3 percent of the companies indicated having enhanced recycling, which may be the result of increased knowledge on the subject. New waste regulations may also explain the popularity of enhanced recycling, as packaging material recycling rate is aimed to increase to 65 percent by 2025, which includes cardboard, glass, metal, and plastic packaging (Ministry of the Environment, 2020). Companies may thus be also already preparing for tightening legislation. Other popular sustainability measures revolved around production and logistics with 76.7 percent of the participants expressing logistics optimization and over 60 percent in waste and resource efficiency, production processes optimization, or sustainable sourcing improvement. It is more likely for companies to introduce sustainability actions, which can be seen to directly benefit the profitability of the company, as all above-mentioned measures do. Companies may unknowingly practise eco-efficiency strategy, in which the simultaneously reduce cost and environmental impact of their processes, creating a win-win situation (Orsato, 2006). Based on the answers provided by the participants, it can be said, that if companies see clear benefits in sustainability related initiations, for instance carbon neutral transportation, they are more likely to be infiltrated into company operations.

The Finnish government has set a goal for Finland to become the world's first carbon neutral welfare state by 2035 (Ministry of the Environment, 2021), which without a doubt affects the number of companies setting their own carbon neutrality goals. However, only 16.6 percent of the companies participating in this survey indicated having set such goal. As mentioned, the ambitious goal by the Finnish government will force companies to act accordingly as well, and new legislation and supportive measures will increase the number of companies setting carbon neutrality goals in the near future. The trend is growing, both in Finland and globally, as companies are striving to demonstrate their operations being carbon neutral, for instance, by compensating emissions, which they are not able to reduce through technological improvements and innovations, or if the cost of doing so is prohibitively high (Forest Trends Ecosystem Marketplace, 2020; SYKE, 2021). In addition, globally significant companies pledging carbon neutrality push smaller companies to act accordingly (Forest Trends Ecosystem Marketplace, 2020).

To achieve carbon neutrality goals, companies need deep and cost-efficient emission reductions, which are often enforced by financing emission reductions elsewhere (Forest Trends Ecosystem Marketplace, 2020). The results from this survey support the above-mentioned statement, as 60 percent of the participating companies that have set carbon neutrality goals, also expressed having compensated emission generated in production and manufacturing. 40 percent of the companies with carbon neutrality goals also expressed having compensated emissions from transportation and distribution, or from company's facilities. The percentages clearly indicate that companies with set carbon neutrality goals are more likely to compensate emissions than companies without said goals.

It would thus be meaningful for companies offering compensation services, such as carbon neutral transportation, to target their marketing towards clients with carbon neutrality goals. In addition, research by Forest Trends Ecosystem Marketplace (2020) indicate that companies that have compensated emissions in the past are more likely to continue compensating emissions generated in their operations.

5.2 Carbon neutral transportation as a part of company's strategies

One of the research questions in this thesis aimed to expose Finnish companies' perceptions on whether added value is brought to their brand or product by compensating transportation emissions. A method of expressing the implementation of such actions would be a certificate companies receive when purchasing the service. Said method is being utilized by logistics service provider DHL, which provides its clients with a certificate when purchasing the compensated service (DHL, 2020). The certificate, when implemented right, also acts as a marketing tool for the company providing it. As is in the context of the case-company, clients often outsource all their logistics operations, and purchasing compensation services directly from the transportation service provider would be likely.

Nearly half of the survey participants indicated that an above-mentioned certificate would bring added value to their brand or product. It remains to be unknown whether the percentage would have been even higher in the case that the participants practiced b2c sales. Nadanyiova et al. (2020) emphasize that companies are aiming to meet the growing demand for environmentally friendlier products. In addition, marketing sustainable actions is considered essential by the target customer segment of many environmentally differentiating brands (Nadanyiova et al., 2020). As the survey participants, mainly operating in b2b environment, see potential in such certificate, the potential popularity of it may be explained in terms of marketing. A study by Bansal and Roth (2000) indicated that companies can potentially improve their long-term profitability by, for instance, eco-labelling and performing green marketing. Green marketing cannot, however, solely rely on certification or eco-labelling, but rather needs to be embedded into the entire marketing strategy of the company (McDaniel & Rylander, 1993). By reflecting the survey results to literature, a demand for a carbon neutral transportation certificate is evident.

Companies participating in the survey saw in general, that carbon neutral transportation could potentially be embedded into their marketing strategy. The results were in line with companies' views on the potential benefits a certificate would present, as discussed in the previous paragraph. There are several sources

supporting the positive perception on the topic. Moravcikova et al. (2017) illustrate that by implementing green marketing strategies, companies potentially attain higher profitability, competitive advantage, improved stakeholder relations, and better environmental performance, all which lead to gaining competitive advantage. Maziriri (2020) and Nadanyiova et al. (2020) came to the same conclusion when studying the cause-effect relationship between green marketing and competitive advantage. Carbon neutral transportation may well act as a tool, or part of the green marketing strategy, in gaining competitive advantage through differentiation. Porter (1985) explains that a company may differentiate itself through, for instance, lesser environmental impact of their operations when compared to competitors. Carbon neutral transportation could act as a valid piece of a conventional extroverted strategy of a company, in which the aim is to increase company credibility and differentiate from the competitors by communicating company's sustainability commitment to the society (Baumgartner & Ebner, 2010).

When the focus point of incorporating carbon neutral transportation into company strategies is shifted from the marketing potential of the service, into how the service could be incorporated into companies' sustainability strategies, the survey results illustrated high potential. 52.83 percent of the participants indicated to completely agree, or agree, with the statement that carbon neutral transportation could potentially be part of their company's sustainability strategy. It is crucial for companies to improve and develop environmental strategies and environmental responsiveness regarding stakeholder pressure, and to meet the environmental demands of various external stakeholder groups (Wang et al., 2020). Sustainability strategies vary substantially between companies but incorporating transportation emissions compensation into them should not be difficult. Another question is, however, how much emphasis compensation should hold in the strategy. It is not sustainable to build a strategy to heavily rely on compensation measures, and they should only compliment the rest of the sustainability measures. Compensating carbon emissions does not necessarily encourage innovations to reduce the emissions where they are emitted. In addition, offsetting may have a rebound effect resulting in more emissions generated in some cases. (Gössling et al., 2007). However, as climate change progresses, immediate actions are needed, and carbon offsetting offers a great short-term tool for this. As previously also explained, companies can rarely have an influence on developing transportation related aspects of their operations as they are usually outsourced.

The results of the questionnaire revealed that most of the participants consider ecological pro-activeness to improve companies' long-term profitability, which is supported by literature (see e.g. Bansal & Roth, 2000; Prayag et al., 2017). Ecological pro-activeness may include, for instance, utilization of eco-labels, thus, environmental differentiation through eco-labeling, certification, and compensation can be seen as strategies to enhance financial performance and gain long-term competitive advantage. Approximately every fifth participants did not,

however, see ecological pro-activeness to improve company's profitability in a long run. Companies expressing the above-mentioned are likely to practice reactive environmental strategies in their operations (if anything), in which they aim to meet the bare minimum environmental regulatory requirements (Wang et al., 2020).

Carbon neutral transportation was perceived as an attractive service according to the survey participants, as 38.3 percent indicated interest in purchasing such premium service. Additionally, only 11 percent indicated directly not being interested in paying for it. This was somewhat anticipated, as participants had expressed positive attitudes in the previous questions towards the benefits such service would present to their company. As usual, the premium service's price was an extremely important factor for the companies indicating interest in purchasing it. The participants were asked to elaborate the optimum price for said service, and the consensus was that it should be only marginally more expensive than the regular service. According to Forest Trends Ecosystem Marketplace (2020), an average price for a carbon credit (1tCO₂e) in 2019 was \$4.26. It is, however, meaningless to present an estimate on how many credits would be needed to compensate a particular freight transit, as the calculations are heavily affected by the mode of transport, travelled distance, and the size of the cargo. Different project types and their prices will be further examined in chapter 5.3.

As previously mentioned, companies are more likely to compensate emissions if they have already used compensation in the past in some part of their operations (Forest Trends Ecosystem Marketplace, 2020). The results from this study confirm this, as 39 percent of the companies interested in the premium service had already compensated their transportation emissions in the past. Also, 35 percent had compensated emissions from production/manufacturing, and 30 percent from emissions related to facilities. Companies have clearly detected the benefits compensation holds, as described previously, and it can be said, that companies taking part in the survey see potential in carbon neutral transportation bringing added value to their brand or product. As emphasized by Reinhardt (1998), corporate customers are more willing to pay for premium price on environmentally differentiated service if they benefit from it in financial terms.

5.3 Factors influencing the compensation purchase decision

The survey results clearly indicate that companies feel they should have an influence on the project type selection, when paying for compensation services. Nearly 80 percent of the participants stated to, at least somewhat, agree with the above-mentioned. Also, in a situation in which the participants would not be able to choose the project type themselves, 70.6 percent expressed that the given project type would have an influence on the decision on whether to purchase the offset service or not. Thus, it is meaningful to further investigate the popularity

of different project types selected by the participants and reflect the findings on the global trends in terms of offset project type market shares.

Energy-related projects emerged as the most popular when the participants were asked to identify most appealing offset project types from a list of different projects. The global VCM statistics presented next are produced by Forest Trends Ecosystem Marketplace (2020). 55 percent of the participants expressed renewable energy investments to be among the most interesting offset project types, which is in line with global VCM statistics, as renewable energy was the most transacted project type, with 42.4 MtCO₂e (Megatons of carbon dioxide equivalent) compensated in 2019, with an average price of \$1.40 per credit. Energy efficiency projects were selected by 53.3 percent of the participants as one of the most appealing project types, which differs drastically from global statistics, as 3.1 MtCO₂e were compensated through said projects in 2019, with an average price of \$3.90 per credit. The third most popular option selected by the participants was transportation efficiency improvement with 43.4 percent. As with energy efficiency projects, the global demand is much lower, with 0.4 MtCO₂e compensated globally in 2019, and with an average price of \$1.70 per credit. Another popular offset project type chosen by the participants was water security projects with 40 percent selection rate. The transaction rate for such projects is globally insignificant compared to, for instance, above-mentioned project types. Nevertheless, water security projects conceal huge potential. Water security improvement presents health benefits to local communities, but also reduced carbon emissions as water is no longer needed to boil, saving firewood (Carbon Footprint, 2021).

As presented above, the trend in renewable energy investments as compensation measures is similar between the participants and global transaction statistics. However, with other project types described above, the relative popularity varies hugely. It is noteworthy that the participants did not in general find project types relating to forestry as appealing as, for instance, water security or transportation efficiency. In 2019, forest and land-use-related offset projects were transacted by 36.7 MtCO₂e, which makes it the second most popular project category after renewable energy investments (Forest Trends Ecosystem Marketplace, 2020). It remains unclear, why the selection rate of forestry-related project types between the participants remained considerably lower than the global transaction statistics would suggest, but Finland's status as a traditional forest industry state may have an influence on the issue. On the other hand, 43 percent of the participants expressing interest in purchasing carbon neutral transportation services selected forest protection to be among the most interesting offset project types, while the rest of the project type selection rates remained somewhat unchanged. The average price for a forestry-related carbon credit was \$4.30 in 2019, which is considerably higher than with renewable energy, but the popularity can be explained by companies willing to pay premium for credits thought of having strong environmental credentials (Forest Trends Ecosystem Marketplace, 2020). This indicates that participants, who expressed interest in purchasing the

service, have probably researched the topic, and see more than just carbon compensation in the process, as in credits having also other attributes. For instance, REDD+ projects, which fall into the forestry related compensation category, also contribute to the UN's Sustainable Development Goals in creating jobs and supporting the rights of indigenous people (Forest Trends Ecosystem Marketplace, 2020).

When the offset project types selected by the participants, global transaction rates, and average prices for each offset project type are concluded, it can be said that projects revolving around renewable energy would be optimal for Finnish companies desiring to offset their emissions. Participants indicated that carbon neutral transportation should not cost substantially more than existing services, which makes cheap renewable energy carbon credits ideal. In addition, the global demand ensures that there will be vast number of said projects to invest in around the globe. Forestry-related offset projects are another good option for Finnish companies to participate in, but many companies may not be willing to pay the higher price.

Factors besides offset project type were also investigated, and the participants expressed slight agreement, that the mode of transport and the amount of purchased transportation services affect the decision to purchase carbon neutral transportation services. However, the finding does not elaborate, whether participants' willingness to compensate transportation emissions is lower when the amount of purchased services is low, or if the willingness to compensate emissions is lower when the amount of purchased services is high.

In conclusion, the offset project type has the most influence on the purchase decision according to the survey participants. As global trends indicate, renewable energy projects were detected also in the survey as the most popular options when compensating emissions. Forestry-related projects are, however, desired project types between companies interested in paying for a premium service in carbon neutral transportation. This can be explained by the results indicating that the companies interested in carbon neutral transportation had compensated emissions already in the past, and companies that have familiarized themselves with the topic of carbon offset demand more attributes from carbon credits than merely cheap price.

5.4 Validity, reliability, and suggestions for future research

Validity expresses how well the selected research method is able to provide insights to the determined research questions. Validity of the research is considered good if the presented questions and the focus group are well thought through. (Hiltunen, 2009). As the questionnaire in this thesis was constructed around the research questions, and the population was predetermined by the client base of the case company, validity can be considered good.

Validity can be further divided into internal, and external validity. Internal validity refers to the balance of the methodological choices and the outcome of the research. Aspects to consider when evaluating the internal validity are time (has there been any significant events between measurement periods?), measurement situation (has the research itself affected the focus group?), indicators (are the selected indicators valid?), cognitive bias (is there bias in selection criteria?), and loss (is the number of responses sufficient?). (Hiltunen, 2009). All things considered, the research in this thesis fulfils the above-mentioned criteria, thus the internal validity is good. External validity, on the other hand, is considered when the universalization possibility of the results is thought of. In other words, in which population, situation, or settings can the results be generalized. (Hiltunen, 2009). As this thesis aimed to find out Finnish companies' views on added value compensating transportation emissions could bring to their brand or product, and the number of participating companies remained relatively low at 60, the external validity cannot be considered sufficient. In addition, the population represented the client base of only one logistics service provider, which weakens the external validity further.

Reliability expresses the constancy and repeatability of the selected research methodology in the same context (Hiltunen, 2009). There is no reason why the results should vary in a situation in which the research is repeated. Thus, the reliability of this thesis can be considered good. This statement is supported, when the survey results are compared to literature, which indicates similar trends as the outcome of this study.

As all research, this thesis has its limitations. By introducing qualitative research methods in terms of interviews, a deeper understanding of companies' argumentations towards the topic could have been revealed. Another limitation is the population, as it does not necessarily reflect the views of all Finnish companies. It must be stated, however, that as this thesis was partly conducted to provide market research for the case-company, the information gathered may be extremely beneficial. The case-company should be, at least partly, able to develop their future business strategies based on this research.

As mentioned, qualitative research on the topic could present deeper insights on companies' attitudes on the topic. This method should, however, focus for instance on certain industries, to maximize the usefulness of the research. Future research could also focus on the views of b2c companies, as the participants in this thesis mostly represented b2b companies. In addition, if a company received a certificate indicating carbon neutral transportation, it would be meaningful to further study consumer perceptions on the said certificate, and whether they see it to enhance the brand image of the company applying it into their marketing strategy.

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APPENDIX 1 Cover letter for invitation to the questionnaire

Title: Kutsu päästökompensaatiokyselyyn / An invitation to a carbon offsetting questionnaire

Hyvä Wiima Logisticsin asiakas,

(in english below)

Kartoitan Wiima Logisticsin asiakkaiden näkemyksiä hiilineutraalista kuljetuspalvelusta osana pro gradu tutkielmaani Jyväskylän yliopiston kauppakorkeakoululle. Kyselyssä kartoitetaan mm. asiakkaiden tarpeita edellä mainittua palvelua kohtaan, sekä ajatuksia hiilineutraalin kuljetuksen tarjoamista mahdollisuuksista yrityksille.

Yrityksenne on valikoitu ottamaan osaa kyselyyn Wiima Logisticsin asiakasrekisterin perusteella. Kyselyyn pääsee vastaamaan alla olevan linkin kautta ja aikaa sen tekoon menee noin 5–10 min. Kyselyyn on mahdollista vastata suomeksi tai englanniksi.

<https://link.webpolsurveys.com/S/9719974F8BEF7E68>

Kyselyn tuloksista tullaan myöhemmin julkaisemaan yhteenveto, joka tullaan jakamaan kaikkien kyselyyn vastanneiden kesken.

Mikäli ette ole tietoinen yrityksenne tarpeista hiilineutraaleja kuljetuspalveluita kohtaan, pyytäisin ystävällisesti välittämään tämän viestin asianomaiselle taholle.

Vastaukset tullaan käsittelemään luottamuksellisesti, eikä yrityksenne nimeä tulla julkaisemaan missään.

Kyselyyn on mahdollista vastata 23.4. asti.

Mikäli Teille heräsi kysymyksiä kyselyyn liittyen, voitte ottaa minuun yhteyttä alla olevan sähköpostiosoitteen välityksellä.

Ystävällisin terveisin,
Wiima Logistics Oy:n puolesta,

Aleksi Eloranta
Jyväskylän yliopiston kauppakorkeakoulu
aleksi.l.eloranta@student.jyu.fi

Dear Sir or Madam,

I am conducting a survey among the customers of Wiima Logistics, as part of my Thesis for the University of Jyväskylä, about their views on carbon neutral logistics services. The aim of the survey is to map customers' needs for the above-mentioned service, as well as views on the potential benefits companies gain from purchasing carbon neutral logistics services.

Your company has been selected to take part in the survey on the basis of Wiima Logistics customer register. It is possible to take part in the questionnaire in English or Finnish, and it will take 5-10 minutes to complete. You can access the questionnaire via the link provided below:

<https://link.webpolsurveys.com/S/9719974F8BEF7E68>

A summary of the survey will be published later, which will be sent to all companies completing the questionnaire.

In case you are not familiar with your company's needs regarding carbon neutral logistics services, I kindly ask you to forward this e-mail to the corresponding person/department in your company.

All answers will be handled confidentially, and your company name or your name will not be published anywhere.

I kindly ask you to complete the questionnaire 23.4. latest

In case you have any questions regarding the survey, please do not hesitate to contact me via the e-mail address presented below.

Best regards,
On behalf of Wiima Logistics Oy,

Aleksi Eloranta
University of Jyväskylä – School of Business and Economics
aleksi.l.eloranta@student.jyu.fi

APPENDIX 2 Carbon offsetting questionnaire

1. Company and respondent information

Name of the company _____
Industry _____
First name of the respondent _____
Last name of the respondent _____
Position in the company _____

2. Is your company mainly engaged in B2B or B2C sales?

- B2B
- B2C

3. How familiar are you with the concept of carbon offsetting?



Carbon offsetting refers to a reduction in emissions of carbon dioxide made in order to compensate for emissions made elsewhere.

E.g., 1000kg of carbon dioxide emissions created in road transportation can be compensated by planting forest with a capability to absorb 1000kg of carbon dioxide from the atmosphere.

Carbon emissions can be compensated for instance by renewable energy infrastructure financing, reforestation and forest protection, destruction of environmentally hazardous industrial substances, or energy efficiency improvement.

4. Has your company compensated carbon emissions from any part of company's operations?

	Yes	No	Cannot tell	Do not want to answer
Production/manufacturing *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation/distribution *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facilities *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sourcing *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sales/marketing *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Warehouse operations *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, what? <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Has your company introduced any other sustainability actions in the past five years?

	Yes	No	Cannot tell	Do not want to answer
Paperless office *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhanced recycling *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduced use of plastics *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Waste reduction in manufacturing / improved resource efficiency *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limiting business travel (prior to COVID-19) *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Optimizing production processes *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Optimizing logistics *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving the sustainability of sourcing *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Introducing environmental management systems *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, what? <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

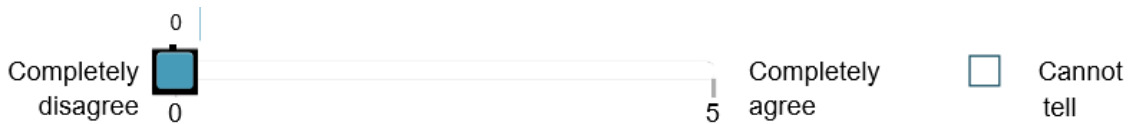
6. Does your company have a schedule for becoming carbon neutral?

- Yes
- No

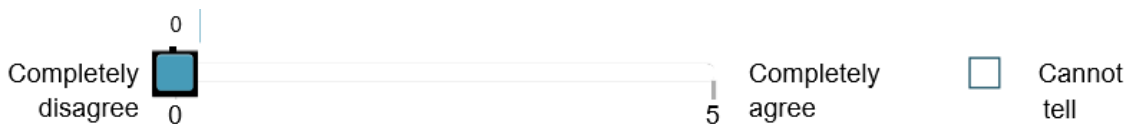
- Cannot tell
- Do not want to answer

7. To which year is the goal for becoming neutral set?

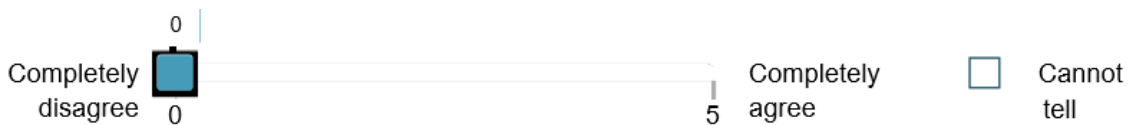
8. A certificate indicating carbon neutral transportation would bring added value to your company's brand or product



9. Carbon neutral transportation could be used as a part of your company's marketing strategy



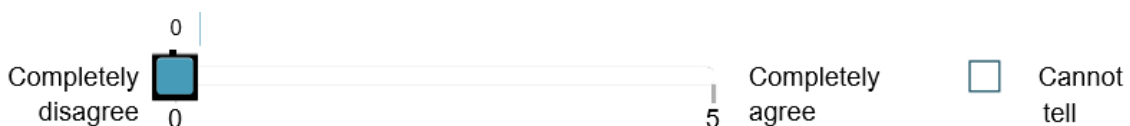
10. Ecological pro-activeness potentially improves the long-term profitability of a company (e.g. ecolabeling)



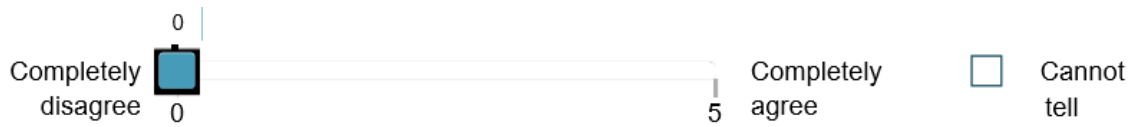
Carbon credits can be purchased from voluntary carbon market, in which case they are used to compensate emissions created in company operations.

Regulatory carbon market is used by companies to purchase offsets in order to meet their emission reduction targets or carbon dioxide emission caps.

11. Carbon credits purchased from voluntary carbon market are more beneficial for a company than regulatory offsetting



12. Carbon neutral transportation could be a potential piece of your company's sustainability strategy



13. Would your company be interested in paying for a premium service in carbon neutral transportation?

- Yes
- No
- Cannot tell
- Do not want to answer

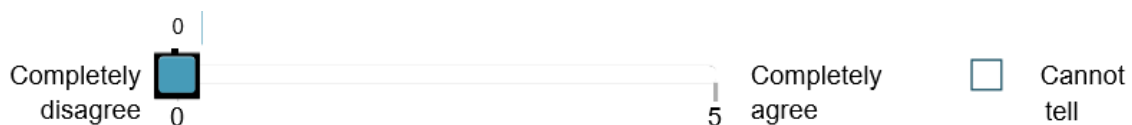
14. What would be the optimum price for the service?

15. Please describe the reasons why the service is not attractive

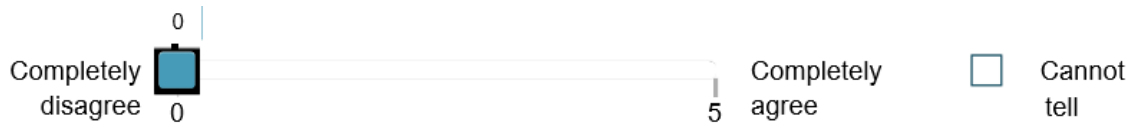
16. Have you considered optimizing company's logistics related emissions through Green Control Tower solutions?

- Yes
- No
- Cannot tell
- Do not want to answer

17. The mode of transport affects the decision to offset emissions

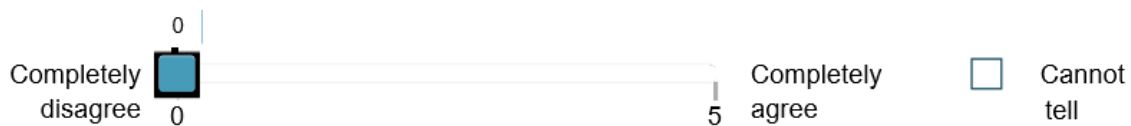


18. The amount of purchased transportation services affects the offset decision



Different types of offset projects include e.g., financing renewable energy production, energy efficiency improvement, reforestation, destruction of environmentally hazardous industrial substances, and forest protection.

19. A company should have an influence on the offset project type when paying for compensation



20. The offset project type has an influence on the compensation purchase decision

m



21. In a situation where it is possible to affect the offset project type, please select three (3) most interesting ones from the list below

- Investing in renewable energy
- Projects on energy efficiency
- Improved forest management
- Forest protection
- Reforestation projects
- Destruction of industrial pollutants or agricultural byproducts
- Destruction of landfill methane
- Transportation efficiency improvement
- Water security projects
- Other, what? _____

22. Anything to add or comment?
