



Towards a greener distribution

A study for Bewi Insulation

Annika Matintupa

Degree Thesis
Business Administration
2022

EXAMENSARBETE	
Arcada	
Utbildningsprogram:	Företagsekonomi
Identifikationsnummer:	8394
Författare:	Annika Matintupa
Arbetets namn:	Towards a greener distribution A study for Bewi Insulation
Handledare (Arcada):	Erica Adlercreutz
Uppdragsgivare:	Bewi Insulation
<p>Sammandrag:</p> <p>I EU står transportsektorn för 25 % av alla koldioxidutsläpp. Både på EU-nivå samt på nationell nivå har miljömål lagts upp för att minska de skadliga utsläppen, bland annat koldioxidutsläpp. Detta är nödvändigt för att bromsa upp den globala uppvärmningen. Dessa miljömål tvingar företag att agera och lägga upp sina egna miljöstrategier. Denna studie utförs på uppdrag av Bewi Insulation. Bewi Insulation är ett företag som tillverkar isoleringsskivor i polystyren. Ett av Bewi Insulations miljömål handlar om att 50 % av deras transporter skall skötas av fordon drivna med fossilfria bränslen. Målet är ämnat att uppnås till och med år 2030. Bewi Insulations produktdistribution sköts av underleverantörer. Syftet med denna studie är att kartlägga underleverantörerna i hur gröna deras transporter för tillfället är. Av intresse är även deras framtidsplaner, samt deras attityder gentemot grön transport. Två korrelationstest har även utförts för att reda ut ifall det finns samband mellan variabler. Metoden som använts för datainsamlingen är en kvantitativ enkätundersökning. Enkäten distribuerades digitalt till 28 transportbolag, som fungerar som Bewi Insulations underleverantörer. Av dessa svarade 20 på enkäten. Resultaten visar att nivån av engagemang i grön transport ligger på en god nivå bland Bewi Insulations underleverantörer. Attityderna är också positiva. Det finns dock skillnader mellan aktörerna, så beroende på val av samarbetspartners så kommer hållbarhetsmålet antagligen att kunna uppnås snabbare med en del, än med andra. En medelstark positiv korrelation kunde konstateras mellan attityderna gentemot grön transport samt redan tagna åtgärder inom ett företag. Dock var korrelationen starkare mellan storleken av ett företags årliga omsättning och tagna åtgärder. Detta betyder alltså att på vilken nivå ett företag är då det handlar om grön transport är mer en fråga om resurser än attityder.</p>	
Nyckelord:	Bewi Insulation, underleverantör, grön transport, logistik, hållbar distribution, miljömål
Sidantal:	
Språk:	Engelska
Datum för godkännande:	

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Supervisor (Arcada):	Erica Adlercreutz
Commissioned by:	Bewi Insulation
<p>Abstract: In EU, the transport sector is responsible for 25% of all CO₂ emissions. Both on EU level and on a national level, environmental targets have been set to reduce harmful emissions, such as CO₂ emissions. This is necessary to slow down global warming. These environmental objectives force companies to act and set out their own environmental strategies. This study is conducted on behalf of Bewi Insulation. Bewi Insulation manufactures insulation boards made out of polystyrene. One of Bewi Insulation's environmental goals is that 50% of their transports should be handled by vehicles powered by non-fossil fuels. The goal is intended to be achieved by 2030. Bewi Insulation's product distribution is handled by subcontractors. The aim of this study is to map the subcontractors on how green their transports are at the moment. Of interest is also their future plans, as well as their attitudes towards green transport. Two correlation tests are also performed to see if there are correlations between variables. The method used for the data collection is a quantitative survey. The survey was distributed digitally to 28 transport companies, which act as Bewi Insulation's subcontractors. 20 responded to the survey. The results show that the level of engagement in green transport is at a good level among the respondents. The attitudes are also positive. However, there are differences between the subcontractors, so depending on the choice of partners, the sustainability goal will probably be achieved faster with some, than with others. A medium strong positive correlation was found between the attitudes towards green transport and actions already taken within a company. However, the correlation was stronger between a company's annual turnover and actions taken. This means, that the level at which a company is when it comes to green transport is more a question of resources than a question of attitudes.</p>	
Keywords:	Bewi Insulation, subcontractor, green transport, logistics, sustainable distribution, environmental targets
Number of pages:	
Language:	English
Date of acceptance:	

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1 INTRODUCTION

In today's world we have reached a point where we all need to come together and make a change. A change in how we live our daily lives, and how we run our businesses. We simply cannot go on like we have before, without thinking about the consequences. Sustainability is on everyone's agenda. United Nations defines sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs"(United Nations 2021a).

Sustainability covers three areas. The so called three pillars of sustainability are: environment, society, and economy (University of Alberta 2013). This paper will look at sustainability from the environmental point of view, and especially on the CO₂ (carbon dioxide) emissions that heavy goods vehicles produce. These emissions contribute to the phenomenon called global warming.

Global warming is "the long-term warming of the planet's overall temperature" (National Geographic 2016-2021). It is human behavior which has led to the world heating up, in a faster pace than it naturally would do. The burning of fossil fuels releases emissions into the atmosphere. These emissions then absorb heat from the sunlight and warms the earth. This is called the greenhouse effect, since the emissions act as a roof, preventing the heat to be released back into space. CO₂ is one of the greenhouse gases that contribute to global warming. (Nasa 2021) In 2010, 14% of all greenhouse gas emissions globally, came from transportation, and the fuels used, were in 95% of all cases fossil fuels, mainly diesel and gasoline. (EPA 2021)

In august 2021 IPCC, The Intergovernmental Panel on Climate Change released their sixth assessment report on climate change (IPCC 2021a). The report has a clear message. The world is facing a climate crisis, and a reduction of emissions is urgent. Sustainability targets all over the world need to be tightened, and actions taken immediately, in order to stop global warming. (Statsrådet 2021)

Since environmental awareness is growing, both individuals and companies are starting to take initiatives towards cleaner solutions. However, it is not only goodwill and

awareness that are the driving forces for greener alternatives. Laws and regulations also call for action.

1.1 Problem statement

In EU, 25 % of all CO₂ emissions emerge from the transport sector. The mode of transport that is responsible for the majority of the emissions, is road transport. In 2014 70% of all greenhouse gases in Europe within the transport sector, emerged from road transport. (European Commission 2021a).

The European Commission has set shared targets for all member states, to cut the CO₂ emissions with 30% by 2030 (European Commission 2021b). For a country to be able to reach the targets set on a national level, businesses need to incorporate sustainability actions into their operations.

At a company called Bewi Insulation one of their sustainability targets is to reduce CO₂ emissions, by moving towards a use of non-fossil fuels when distributing their products. At Bewi Insulation, the distribution is handled by subcontractors, therefore there is a need for information on how green their transport operations are.

1.2 Aim of the study

This study is conducted on behalf of a company called Bewi Insulation. One of their sustainability targets is, to have 50% of all transports carried out by vehicles fueled with non-fossil fuels, by 2030 (Bewi 2020 p.11).

The aim of the study is to map Bewi Insulation's subcontractors on green transport. This includes their attitudes regarding it, what they are doing today, and how they look at the future. Does the attitudes towards green transport correlate with actions taken in a company? Or is it only a question of resources? The results of the study will serve as a basis for Bewi Insulation, and help them achieve a greener distribution, which is part of their sustainability strategy.

The research questions this study aims to answer are:

- What are the subcontractors attitudes towards green transport?
- What are the subcontractors doing today and what are their plans for the future?
- Is there a relationship between the attitudes towards green transport and actions taken and future plans?
- Is there a relationship between a company's yearly turnover and actions taken combined with future plans?

1.3 Demarcation

Bewi Insulation's sustainability strategy covers several areas. This study will focus only on the environmental target of reducing CO₂ emissions that emerge from the distribution of their products (see fig. 1). It will not consider economical nor societal sustainability targets.

This study will serve as a preliminary study. The results of the study will only give information on what the situation amongst the subcontractors is today, and what the plans for the future look like at the moment. In this first stage, the study will map only the subcontractors that Bewi Insulation has a valid contract with at the moment. The study will not include any other transport companies. The current subcontractors are transport companies based in Finland.

The results are meant to serve as guidelines for the decisionmakers at Bewi Insulation and are not generalizable since they concern specifically the subcontractors of Bewi Insulation.

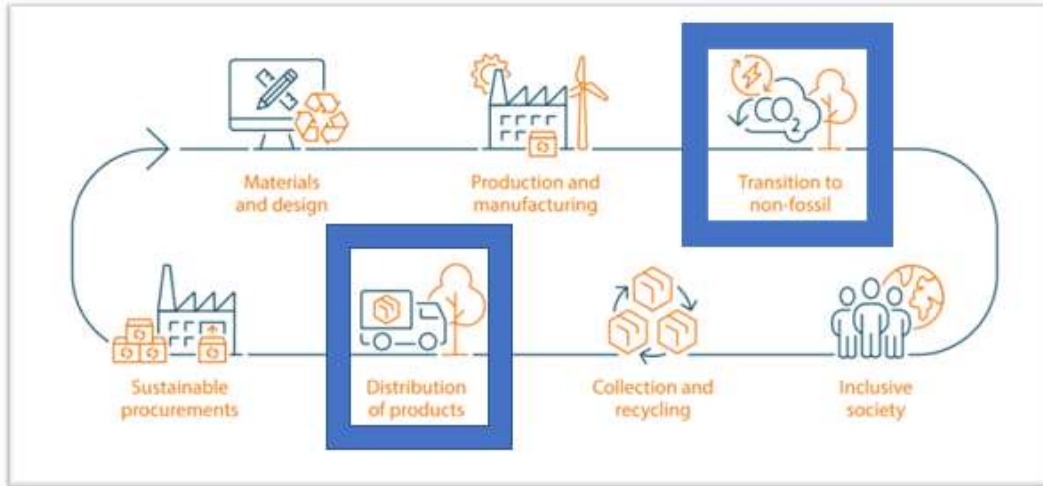


Figure 1. Bewi's actions to reach sustainability targets (Bewi 2021a p.14).

1.4 Definitions

Sustainability: United Nations defines sustainability as “meeting the needs of the present without compromising the ability of future generations to meet their own needs”(United Nations 2021a). In this study the focus will be on the environmental pillar of sustainability.

Global warming: Global warming is the long-term heating of earth's overall temperature since the pre-industrial period. The phenomenon is caused by human activities, primarily burning of fossil fuels. (Nasa 2022)

CO₂: CO₂ is the chemical formula for carbon dioxide, which is one of the most important greenhouse gases that are linked to global warming (Britannica 2022).

Subcontractor: “A person or a business firm contracted to do part of another's work” (Dictionary.com 2022)

Distribution: Distribution means delivering products from the manufacturer to the customers (Oberlo 2015-2022).

Climate neutral: Climate neutrality means that someone's impact on the environment is neutral. The CO₂ emissions that are released into the atmosphere is the same as the amount being removed. (Compensate 2021)

Green transport: The concept of Green Transport in this paper refers to heavy goods vehicles and their impact on the environment through the CO₂ emissions they emit. By considering several factors, the impact can be reduced, and transport hence become greener. Factors that can make transport greener are for instance: Vehicle type and euro emission standard, a use of alternative fuels, avoiding empty miles, and optimizing the filling levels of a vehicle. (McKinnon et al. 2015 p. 20)

1.5 Presentation of the company

This study is conducted on behalf of a company called Bewi Insulation. Bewi Insulation is a manufacturing company with production in three cities in Finland. The production plants are located in Kaavi, Tarvasjoki and Ruukki. The company is part of the Norwegian owned Bewi Group. Their main products are insulation boards, made out of polystyrene called XPS and EPS. These are for instance used in housing construction (Bewi 2021b).

The customers are both construction companies and retailers. The majority of the customers are domestic; therefore the products are mainly distributed through road transport and heavy goods vehicles. Most of the products are distributed by subcontractors and their vehicles, but there are also three trucks that are owned by Bewi. The distribution of the products in the area around Tarvasjoki is handled by these trucks.

Bewi has a sustainability strategy that include the whole value chain. This strategy consists of sustainability targets, aimed to be reached by year 2030. (Bewi 2020 p.10)

2 THEORY

The theoretical frame of this paper is presented in this chapter. This study aims to understand what actions transport companies are taking in becoming greener, therefore it is important to know the underlying reasons to why they are doing it.

This chapter starts by presenting the concept of global warming. It continues with looking at international initiatives that have been taken over the years, with the aim of reducing greenhouse gases. After this, emission reduction targets, set by both the European Union and by the government of Finland are discussed. It is important to understand the drivers for greener transport, and the time perspective of when companies need to start acting.

There are many things that affect the environmental impact of transport. A move towards a greener transport require several factors to be considered. These are for instance: Type and euro emission standard of vehicle, a use of alternative fuels, optimizing routes and filling levels, and avoiding empty miles. These are all discussed in chapter 2.2.

2.1 Environmental initiatives and regulations

When the sun warms the earth, excess heat needs to be released back into space through the atmosphere. The atmosphere naturally consists of greenhouse gases, but human activities such as burning of fossil fuels have led to increased levels of these gases. The most common greenhouse gases are CO₂, nitrous oxide, methane, and fluorinated gases. (European Commission 2021c) These greenhouse gases prevent the heat from passing through. Instead, the gases absorb the heat which then radiates in different directions and warms the earth. (Nasa 2021)

Global warming increases both the temperatures of the surface of the earth, and of the water in the oceans. When water gets warmer, it expands. This means that the sea levels are rising, which is a serious issue when it comes to many smaller islands, and coastal cities. (EU Climate Action 2014) Extreme weather conditions like serious droughts and storms are also becoming more common due to global warming. Global warming is also a threat for biodiversity. (United Nations 2021b)

Since early 1970's a lot of different efforts have been made to raise awareness of climate change. For instance, the Brundtland report, released by the world commission on environment and development in 1987, which introduced the concept of sustainability. (Jarvie 2016) In 1988 the Intergovernmental Panel on Climate Change (IPCC) was established. It works under United Nations and provide policymakers with scientific analyzes on climate change. The first report was published in 1990, and the latest in 2021. (IPCC 2021b)

2.1.1 UNFCCC

In 1994 United Nations Framework Convention on Climate Change (UNFCCC) entered into force. UNFCCC recognized that the world was facing a problem. The idea of the convention was to engage member states to strive towards the common goal of decreasing greenhouse gas emissions, "to a level that would prevent dangerous human induced interference with the climate system." (United Nations 2021c)

It was agreed that the developed countries contribute with the most, since they are the ones responsible for the majority of the emissions emerged through industrial processes. (United Nations 2021c) They are obligated to report on their climate change policies regularly and to be transparent about their greenhouse gas emissions. They also agreed on giving both financial and technological support to developing countries. (United Nations 2021c)

In 1997 the Kyoto Protocol was adopted, but due to complex negotiations it entered into force as late as in 2005. The aim of the protocol was to put in action what was agreed upon in the UNFCCC. (United Nations 2021d)

2.1.2 The Paris agreement

The year 2015 was a ground-breaking year, when both the Paris agreement and United Nation's 17 sustainable development goals (SDG's) were established. (Figueres 2015) The Paris agreement is a legally binding agreement which is negotiated under UNFCCC. It was adopted by 196 countries. The goal of the agreement is to limit global warming

preferably to 1,5 degrees Celsius compared to pre-industrial levels. To reach this goal, greenhouse gas emissions need to be reduced.

In practice, the first step is for countries to communicate the actions they are planning to take to reduce emissions. They will also declare how they will build resilience to adapt to the impacts of global warming. From the year 2024 onwards, the countries will be transparent about what actions they have taken. By the end of each 5-year cycle, data on the actions is then assessed. This helps setting recommendations for the next 5-year period.

The Paris agreement follows the same pattern as the Kyoto protocol. This means that countries with better resources have agreed on giving both financial and technical aid to those countries in need of that. It is still a long way until the goal of the Paris agreement is achieved, but because of the agreement, many countries and businesses are setting up carbon neutrality targets. Zero carbon solutions are starting to be competitive, and the trend can be seen especially in the power and transport sector. (United Nations 2021e)

2.1.3 European Green deal

In EU, the European Commission adopted The European green deal in 2021. It is a strategy that aims to lead Europe towards the goal of becoming the first climate neutral continent in the world by 2050. For this goal to be achieved, the member countries have agreed on a reduction of greenhouse emissions by at least 55% compared to the levels in 1990, by 2030. (European Commission 2021d)

The transport sector is responsible for one fourth of all CO₂ emissions in Europe (European Commission 2021d), road transport being the biggest emitter. In 2014, 70 % of all emissions within the transport sector derived from road transport. (European Commission 2021a) This is why ambitious targets have been set exclusively for road transport. The target reduction of 55 % concerns cars, while the target for vans is slightly lower, at 50%. The EU Commission also proposes that new cars should be totally emission free by 2035 (European Commission 2021d). The EU Commission therefore encourage people to start changing from fossil fuelled cars to zero- and low emissions vehicles (European Commission 2021d).

As heavy goods vehicles are responsible for 25% of all CO₂ emissions from road transport, EU set CO₂ emissions standards in 2019, that apply specifically on them. This directive is linked to the Paris Agreement and is one way of achieving the targets. The aim is to reduce emissions of new lorries manufactured from 2025 and from 2030. The targets are a percentage of emissions based on the average levels in EU during a reference period of one year, reaching from 1. July 2019 to 30. June 2020. The reduction target from 2025 is 15% and from 2030, 30%. (European Commission 2021e)

2.1.4 National transport targets in Finland

In 2018 an expert group that works under the Ministry of Transport and Communications came up with an action plan on how to reach zero emissions by 2045 in domestic transport. In Finland the transport sector is responsible for 20% of all greenhouse gas emissions. The expert group suggests that the solution to how emissions can be reduced in the field of logistics and transports, lies in increasing efficiency of goods transport and increasing both the share of non-fossil fuels and of zero- and low emissions vehicles. (Valtioneuvosto 2021)

Transport efficiency means for instance using the most suitable vehicle for a certain task, avoiding both over and under loading, and planning the routes so that the most efficient route is taken (Wabco 2021). The most effective way to achieve an increase in transport efficiency is according to the expert group, to increase the fuel tax.

The use of non-fossil fuels need to be increased. These fuels are domestically produced biogas and liquid biofuels. An increase could be achieved by banning the sale of fossil fuels in 2045. (Valtioneuvosto 2021)

Today only a few percent of all vehicles in Finland are so called zero- and low emissions vehicles. The action plan aims to speed up the shift towards more sustainable vehicles. This could be achieved by offering financial support to people investing in these kinds of vehicles. It has been estimated that there will be around 7000 electric heavy goods vehicles, and 6000 gas-fuelled vehicles on the roads in Finland, in the year 2030. According to the action plan the numbers will continue to rise with a pace that would result in

approximately 42 000 electric heavy goods vehicles and 22 000 gas-fuelled heavy goods vehicles by 2045. (Valtioneuvosto 2021)

2.2 Green transport

There are many things that affect the environmental impact of transport. A move towards greener transport require several factors to be considered. These are for instance: Type and euro emission standard of a vehicle, using alternative fuels, optimizing both routes and filling levels, and avoiding empty miles.

2.2.1 Euro emission standards

Since 1992 Euro emission standards have applied in EU. These standards have enabled a reduction of harmful emissions that vehicles engines emit. The Euro standards that concern heavy goods vehicles, and their diesel engines, mainly focus on gradually tightening the approved levels of nitrogen oxides and particulate matter, but also of CO₂. The first version, EURO 1, which was implemented in 1992, allowed an engine to emit an amount of 4,5 g/kWh CO₂, when the amount allowed today according to EURO 6, is only at 1,5 g/kWh (see Table 1.). (McKinnon et al. 2010 p. 40–41)

Table 1. EURO emission standards (g/kWh) (McKinnon et al. 2010 p.41)

Tier	Date of implementation	CO	HC	NOx	PM
Euro I	1992 (>85kw)	4.5	1.1	8.0	0.36
Euro II	1998	4.0	1.1	7.0	0.15
Euro III	2000	2.1	0.66	5.0	0.10
Euro IV	2005	1.5	0.46	3.5	0.02
Euro V	2008	1.5	0.46	2.0	0.02
Euro VI	2013	1.5	0.13	0.4	0.01

2.2.2 Carbon footprint of road transport

Due to emission reduction targets set by both the government and organizations, there is a need for a common system of measurement. Carbon footprint can be defined as “the total amount of carbon dioxide and other greenhouse gases (expressed in CO₂ equivalents) emitted directly and indirectly from an entity (McKinnon et al. 2010 p. 49-50). The entity can for instance be a product, an activity, an individual or an organization (McKinnon et al. 2010 p.49).

In Finland, the Finnish environment institute has developed calculation tools that can measure and follow climate impacts. For instance, a tool called Y-Hiilari which is aimed for companies and consider different factors, transportation being one of them. (SYKE 2021)

There are two ways of calculating CO₂ emissions that emerge from road transport: The fuel-based, and the activity-based approach. The fuel-based approach uses data on fuel consumption which for instance can be obtained from fuel receipts. The activity-based approach uses data on both vehicle type, and activity level of a specific type of vehicle. Information on activity levels can for instance be obtained through tachograph readings. (McKinnon et al. 2010 p. 60-61)

The type of vehicle also affects the levels of CO₂ emissions. The higher a vehicle’s gross weight is, the higher will also the emissions per vehicle-km be. Vans are hence more fuel efficient than trucks, but since they have a much smaller carrying capacity, their carbon intensity is higher. Carbon intensity is expressed as grams of CO₂ per tonne-km. A high gross weight means lower emissions when measuring from a tonne-km view. This means that a use of fewer heavier vehicles, in fact is more environmentally friendly than using a bigger number of lighter vehicles.

The levels of CO₂ emissions also vary depending on the model of a truck. Based on the tonne-km scale, rigid vehicles (see fig. 2) pollute more than articulated vehicles (see fig. 3). This is because the driving patterns of the different types of vehicles differ from one

another. Rigid vehicles usually distribute lighter loads in urban areas, while articulated vehicles drive longer distances and carry heavier loads. (McKinnon et al. 2010 p. 61)



Figure 2. Rigid vehicle (LM 2021)



Figure 3. Articulated vehicle (LM 2021)

To which extent vehicles are being loaded, is also strongly connected to the carbon footprint of road freight transport. When a vehicle has no load, it still emits around two thirds of the CO₂ emissions that a fully loaded vehicle emits. (McKinnon et al. 2010 p.63) Hence one should always aim for utilizing maximum capacity of a vehicle.

2.2.3 Environmental management systems (EMS)

An environmental management system (EMS) helps organizations reduce their environmental impacts and aims for continuous improvements in the area. When a company implements an EMS, the process starts by committing to an environmental policy. Based on the policy, a plan is then set up. The plan includes environmental targets and an action plan on how to achieve them. The process then continues with evaluation on the company's performance. When evaluating on a regular basis, areas in need of improvement can be identified. The process then repeats itself by setting up a new plan. (EPA 2021)

ISO 14001

A company can choose to use a framework for their EMS called ISO 14001. The ISO 14001 standard is developed by the international organization for standardization and is a continuous improvement process consisting of five stages. These are: Commitment and policy, planning, implementation, evaluation, and review (see fig. 4). By committing to this framework, a company gets an ISO 14001 certificate, which indicates that they are actively working to minimize their impacts on the environment. (EPA 2021)

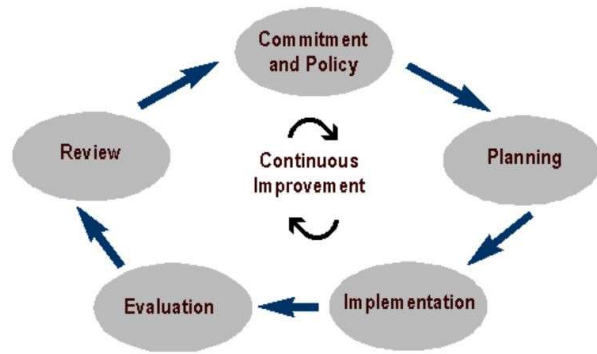


Figure 4. The five stages of ISO 14001. (EPA 2021)

EMAS

EMAS is another framework for improving the environmental performance of a company. EMAS stand for **Eco-Management and Audit Scheme** and was developed by the European commission in 1993. (European commission 2021f) EMAS uses a quite similar structure as ISO 14001. It also aims for continuous improvement and follows four key principles which are: Plan, do, check, and act (European Commission 2021g). When EMAS was introduced, it was aimed for companies in the industrial sector, but today the elements have been updated so that all sectors can implement it. (European Commission 2021h)

2.2.4 Alternative fuels

As fossil fuels are not an option in the future, then what is? The focus has been on finding alternative fuels that emit less CO₂ emissions than traditional fossil fuels, and therefore have a smaller negative impact on the environment. When it comes to alternative fuels it is important to understand the big picture. This means that the fuel should be produced out of renewable sources, otherwise the positive impact of a reduction of CO₂ emissions is outweighed by the negative environmental impacts that occur during the production phase. (McKinnon et al. 2015 p. 23)

There will be a need for updating the infrastructure to meet the new needs that arise, as the number of greener vehicles increase. It is estimated that the amount of alternatively fuelled cars within Europe will rise to around 13 million by 2025. In 2019 there were only

around 975 000. (European Commission 2019) The alternative fuels available for heavy goods vehicles today, are presented below.

Biofuels

There are three types of biofuels that are used in freight transport. These are: Biodiesel, biogas, and bioethanol. The term biofuel refers to a fuel that is produced from organic matter. (McKinnon et al. 2015 p. 23)

Biodiesel is produced from both plant oils and animal fats. (McKinnon et al. 2015 p. 23) It needs to be blended with traditional diesel. The most common blends are called B5 and B20. B5 is a blend consisting of up to 5 % biodiesel, while the concentration of biodiesel is higher in B20, from 6 to 20%. (U.S. Department of energy 2021)

When organic matter starts to break down, a gas called methane is formed. Methane is the gas used in biogas, which also is a type of biofuel. (Stormossen 2021) Even if biogas itself is a 100% renewable fuel, it is dependent on fossil-fuels. (McKinnon et al. 2015 p. 23) A vehicle that is fuelled by gas, usually have two fuel tanks. One for diesel or petrol and the other one for gas. It automatically switches to a use of either diesel or petrol when it runs out of gas. Biogas is a cost-efficient alternative. (McKinnon et al. 2015 p. 23)

Bioethanol is another biofuel. Bioethanol itself is both nontoxic and biodegradable. However, in the process of making ethanol fuel, some toxic substances are added. (EIA 2020) Sources for bioethanol are mainly sugars from wheat, corn, and sugar cane (McKinnon et al. 2015 p. 23). The combustion process of ethanol absorbs CO₂ from the atmosphere. So even if the burning of ethanol releases CO₂ emissions, they can be considered to be compensated, by the amount absorbed during the combustion process. (EIA 2020) How ethanol is produced is directly connected to its overall environmental impact. Some producers burn coal in the process when making ethanol, while others burn for instance corn stocks which is better for the environment. Growing plants for fuel production is also controversial, since many argue that land should be used for growing food crops instead. (EIA 2020)

Electric and hybrid vehicles

An electric car uses electricity as fuel. It is driven by a motor that is powered by a battery. There are also so-called hybrid vehicles that are driven both by electricity and conventional diesel or petrol. (McKinnon et al. 2015 p.23)

The technology development of electric engines when it comes to heavy goods vehicles is still at an early stage. The batteries are quite heavy and has a limited capacity before they need to be recharged. (McKinnon et al. 2015 p.23) According to Volvo trucks the maximum range their fully electric trucks can manage is around 300 kilometres (Volvo 2021).

The main benefits of electric vehicles are that they emit almost no harmful greenhouse gases, and that the engines are really quiet compared to conventional diesel engines. As with bioethanol, the way the fuel is produced is strongly connected to how good it is for the environment. The electricity should be produced from renewable sources to be considered a greener alternative. (McKinnon et al. 2015 p.23).

A move towards a widely spread use of alternative fuels in the field of logistics is still at a very early stage. A mass market for alternative fuels require massive investments in the refuelling infrastructure. The prices of electric trucks, compared to diesel trucks, are at the moment very high. These cost differences will need to be reduced in the future. (Evans et al. 2020 p. 19)

2.3 Bewi Insulation's sustainability strategy

Bewi Insulation's sustainability strategy is based on three pillars. These pillars are to become circular, to actively engage in partnership and to contribute to an inclusive society (see fig. 5) The targets are aimed to be achieved by 2030.

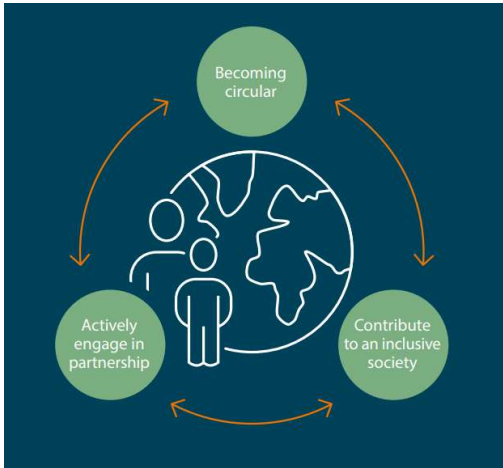


Figure 5. Bewi's sustainability strategy (Bewi 2021a p.7).

To reach the goal of becoming circular, Bewi needs to succeed in three areas. The first is called Lean and is about economic efficiency and the use of renewable energy. The target of having 50% of their transports carried out by vehicles fuelled with non-fossil fuels is part of Lean. Bewi is also aiming to have all of their production units ISO 14001 certified.

The second area is called Keep and is about extending the products' lifecycle, either by improving quality or by repairing or reusing. The third area is called Close and focuses on waste management, with a target of zero production waste due to recycling. (Bewi 2021a p. 8-9)

Actively engaging in partnership is about Bewi taking part in international initiatives concerning circular solutions. They also commit to being a part of research projects to promote innovations in the area of circularity. Bewi's suppliers are also expected to commit to the sustainability strategy and together "create joint value". (Bewi 2021a p. 11)

By being a responsible employer and treating the staff equally and aiming for personal growth of every individual, Bewi contributes to an inclusive society. Bewi also wants to be a responsible neighbour by not harming the areas where they operate. (Bewi 2021a p. 13)

3 METHOD

It is important to choose the right research method for a study, in order to obtain the data of interest. Based on both the aim, and the research questions, the first step is to choose either a quantitative or a qualitative approach. There is also a possibility of combining the two methods. The difference between the methods is that the quantitative method is a data collection technique that uses numerical data, whereas the qualitative method uses non-numerical data. (Saunders et al. 2019 p. 175)

When planning a research project, other things to consider are how, and from where the data is to be collected and how to analyze the results. The researcher also needs to know how to handle ethical issues that are related to research. (Saunders et al. 2019 p.173-174)

3.1 Quantitative method

This study uses a quantitative method, and more specifically a mono method. This means that the data is collected through only one source, in this case through a questionnaire. (Saunders et al. 2019 p.178)

When the purpose of a study is to describe something, it is called a descriptive study. (Saunders et al. 2019 p. 187) In this study the subcontractors are the ones to be described. What they are doing, and what their plans are for the future when it comes to green transport is of interest. However this study will not only describe, but also look for relationships between variables. Is there a relationship between the attitudes towards green transport and the actions the subcontractors have taken, and are planning to take in the future? Another correlation that will be tested is if there is a relation between a company's annual turnover, and the actions taken within a company? A Study that both describes something and explains relationships is called a descripto-explanatory study and is the method chosen for this study. (Saunders et al. 2019 p. 188)

3.2 Respondents

The respondents are transport companies that currently serve as Bewi Insulation's sub-contractors. The respondents were chosen by Bewi Insulation and are a group of 28 companies. 17 of them handle domestic distribution, and 11 of them handle export. There were no requirements on the respondents' job title. The companies were asked to choose a respondent who is familiar with their logistics, and therefore has the knowledge needed to answer the questionnaire.

Usually in a quantitative study, it is hard to reach out to a whole population. Instead, the respondents are a group, called a sample, that gets to represent the whole population. A sample needs to have similar characteristics as the population, so that conclusions about the population then can be drawn, based on the results of the sample. (Saunders et al. 2019 p. 295) However, in this study, no sample was used, since the respondents represent the whole population. The aim is therefore not to generalize the results, but to only describe the population itself.

3.3 Questionnaire

The decision of using a questionnaire for data collection in this study, is based on the fact that it is a common method used for both descriptive and explanatory research. (Saunders et al. 2019 p. 505) The questionnaire can be found in appendix 1.

The title of the questionnaire is "Mapping of green transport". The questionnaire consists of six sections, which collect data on:

1. Vehicles
2. Environment and energy efficiency
3. Sustainability strategy and subcontractors
4. Actions to reduce emissions
5. Green transport
6. Background information

The first five sections include questions based on the theoretical frame of this study, combined with specific questions that Bewi Insulation was interested in getting answers to. Section six collects background information on each company, such as number of employees and yearly turnover. This is valuable information when analyzing and looking for relationships (Saunders et al. p. 514).

All the questions in the fourth section and questions 10, 15, and 16, are based on questions used in a study conducted by Liljamo & Kamppuri (Liljamo & Kamppuri 2020).

3.3.1 Type of questions

The majority of the questions are closed questions since they are both easier, and quicker to answer. When analyzing results, it is also easier to compare answers when reply options have been predefined. (Saunders et al. 2019 p. 519) The questionnaire uses several types of closed questions. These are: List questions, category questions and rating questions. List- and category questions are questions with multiple alternatives to choose from. A list question offers multiple response options, from where the respondent can choose one or several responses. The difference between a category question and a list question is that the respondent can choose only one response in a category question. (Saunders et al. 2019 p. 520-522) The questionnaire uses rating questions to measure the attitudes towards green transport. After each section in the questionnaire there is also an open optional question, which gives the respondents the possibility to freely comment on that specific topic. Open questions can be used in questionnaires; however the use should be kept to a minimum since coding of the answers is very time consuming. (Saunders et al. 2019 p. 520)

3.4 Research approach

The questionnaire was distributed electronically, and the respondents gained access to it through a link. It was available for two weeks, and after the first week, respondents who had not yet answered, were reminded to participate. Three days before the deadline, a representative from Bewi Insulation reminded the respondents one last time to answer the questionnaire, in order to maximise the response rate.

The aim of the study is to provide Bewi Insulation with information on the levels of engagement in green transport, amongst their subcontractors. They want to know what actions are taken and by whom. Therefore the respondents cannot answer the questionnaire anonymously. The questionnaire collects information on for instance company name, yearly turnover, and contact information. Therefore it is extremely important to treat the respondents with respect and follow ethical principles.

The whole process started with a representative from Bewi Insulation preparing the respondents for the upcoming study. This was done through e-mail. A few days later, a covering letter was sent to the respondents through e-mail where they were kindly asked to take part in the study. The letter explained the aim of the study and also included information regarding research ethics. The respondents were informed that participation in the study is voluntary, that personal information is protected according to Bewi's GDPR policy, and that the collected data will be treated confidentially. The results will also be coded and presented anonymously.

3.5 Analysis of the data

How data is analyzed is strongly dependent on the research questions and what the aim of a study is. A study that is interested in only one variable, uses a univariate analysis method (Bryman 2012 p. 337). The variable of interest in this study is the level of engagement in green transport. The main objective of this analysis method is to describe the data. The results are illustrated as frequency distribution tables. (Bryman 2012 p. 337) The frequency distribution table in this study shows the number of companies which have answered in a certain way. It presents the results both as a number, and as a percentage of all responses.

This study is also looking for relationships between variables. In this case the variables of interest are: Actions taken in a company, plans for the future, attitudes towards green transport and yearly turnover. Two correlation tests will be done. The first one is aiming to find out if attitudes towards green transport in a company correlate with what they have done, in combination with the plans they have for the future. The second test will look at

if there is a relationship between a company's yearly turnover and actions taken, together with their future plans regarding green transport.

3.5.1 Pearson's correlation and Spearman's Rho

When testing for relations, two test statistics are used in this study: Pearson's correlation and Spearman's Rho. Both methods measure the degree of a relationship between two variables, and whether the correlation, if it exists, is positive or negative. A positive correlation means that both of the variables move in the same direction, for instance if one variable increases, the other one increases as well. Whereas a negative correlation appears when the variables move in different directions. When one variable increases, the other one decreases. (Hayes 2021) The requirement for using Pearson's correlation is that both variables should be normally distributed, whereas Spearman's Rho can be used when this is not the case (Statistics solutions 2022b).

When using Pearson's correlation, the value being calculated is called Pearson's coefficient (r) and when using Spearman's Rho the coefficient is called Spearman's coefficient (r_s). (Statistics solutions 2022a) In both of the methods, the coefficient values can range from +1 to -1, meaning that if the value is near ± 1 , the correlation is perfect. If the value ranges between ± 0.50 and ± 1 , the correlation is strong. If the value is between ± 0.30 and 0.49 there is a medium strong correlation, and if the value is under ± 0.29 , the correlation is of a low degree. A value of zero means that there is no correlation. (Statistics solutions 2022a)

This study is not aiming to generalize the results, since the questionnaire reaches out to the whole population. Therefore it is not of importance in this case to calculate a confidence interval. A confidence interval indicates how a population probably would answer, based on the results of a sample. (Saunders et al. 2019 p. 294) The results of the questionnaire will be imported into and analyzed using Microsoft Excel as a tool.

3.6 Validity and reliability

When designing a questionnaire, it is important to carefully think through how the questions are formed, and that the structure of it is clear. This will both affect the response rate and the validity and reliability of the questionnaire. (Saunders et al. 2019 p. 516)

Validity of this study have been established through several considerations during the design stage of the questionnaire. Firstly, questions are asked about relevant things for this study. Accurate data needs to be collected so that the research questions can be answered (Saunders et al. p. 517). Since this study is about green transport; therefore, the questions are asked about this specific subject. A good way of assuring validity is also to discuss the questions with others (Saunders et al. p. 517). This has been done several times during the design stage of the questionnaire. Validity of this study is also assured by a use of statistical analysis (Saunders et al. p. 517). The tool used in this study is Microsoft Excel.

The questions in this questionnaire are kept short and clear, to avoid misinterpretations. Consistency increases reliability. Check questions are used, and the answers have been compared to each other in this study, which ensure that the respondents have answered consistently. (Saunders et al. p. 518). Some of the respondents gave inconsistent answers to some questions regarding the vehicles, therefore these answers have been excluded from the results in order to ensure reliability.

4 RESULTS

This chapter presents the results of the empirical study. Subsections 4.1 to 4.6 presents the results on the topics of the questionnaire. After this, the ‘Green index’ and ‘Attitude index’ are explained, and the results of both indexes presented. The chapter ends with a presentation on the results of two correlation tests.

4.1 The respondents

A total of 28 transport companies were asked to take part in the study, of whom 20 answered the questionnaire. The number of employees in the respondents companies vary from under five, to well over one hundred. The majority of the companies are medium sized companies that employ between 20 and 100 people, (see fig. 6) and have a yearly turnover of up to 10 million euros (see fig. 7). 12 of the respondents handle Bewi Insulation's domestic transports and 8 handle exports.

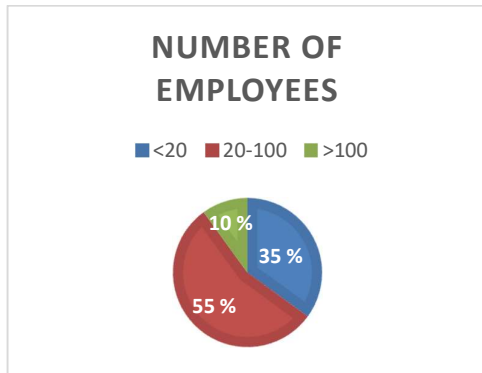


Figure 6. Number of employees

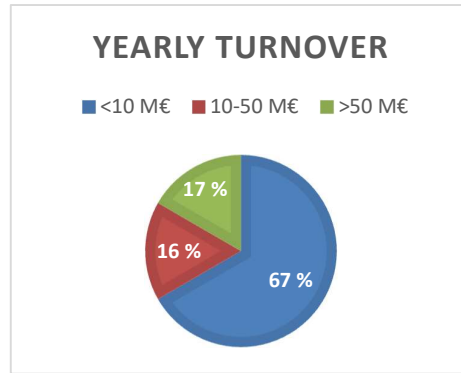


Figure 7. Yearly turnover

85% of the respondents stated that their company uses subcontractors (see fig. 8). This question was answered by all 20 respondents. To which extent subcontractors are used vary quite a lot between the companies. Some use them only to increase their capacity during high season, while others use them continuously. 60% report that their company uses subcontractors either often or quite often.

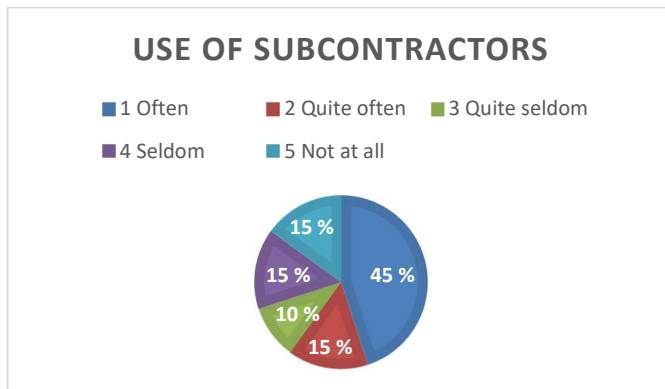


Figure 8. Use of subcontractors

8 Companies use the environmental management system ISO 14001. The rest of the respondents state that they do not use an environmental management system.

4.2 Vehicles

The first section of the questionnaire gathered information on the vehicles. Four of the respondents had answered inconsistently on four questions in this section, therefore they are excluded from these results. The inconsistent answers were given to the following questions: Number of vehicles, model of vehicle, height of cargo space and euro emission standards.

4.2.1 Number and model of vehicles

Altogether, the respondents, in this case 16 companies, own 1713 vehicles. Four companies own fewer than ten vehicles. Eight companies own between ten and fifty vehicles, two own between fifty and one hundred and three own over 150 vehicles. This means that the majority of the respondents who answered this question, own between 10 to 50 vehicles (see fig. 9). The most common model is the semi-trailer combination (see fig. 10).

Since the majority of Bewi Insulation’s subcontractors report that they also use subcontractors, there are far more vehicles at Bewi Insulation’s disposal, than the ones presented in figure 9, owned by the subcontractors themselves.

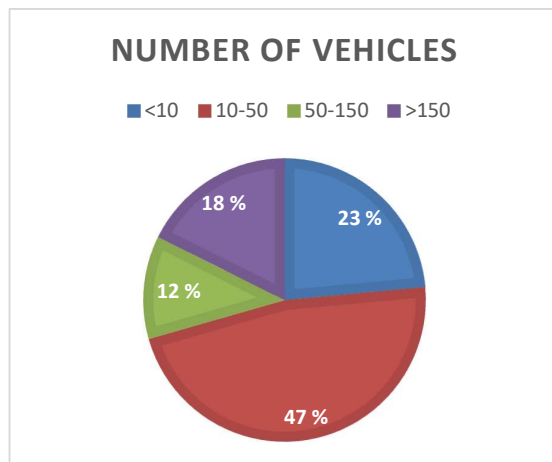


Figure 9. Number of vehicles / company

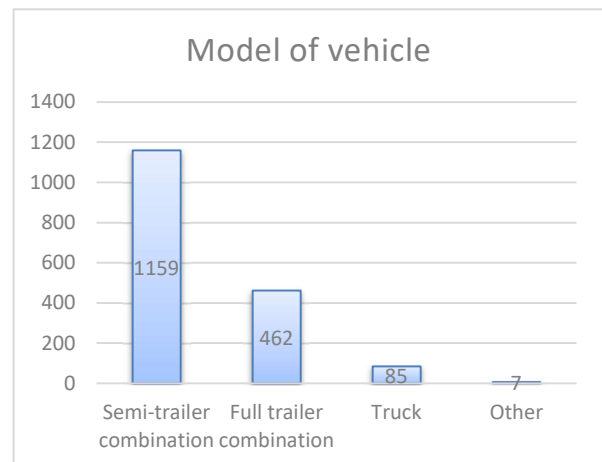


Figure 10. Model of vehicle (pcs)

4.2.2 Euro emission standards

From the total amount of 1713 vehicles, the respondents reported the euro emission standards only for 785 vehicles. The majority of all these vehicles are of Euro class VI (see fig. 11). Four respondents' answers were excluded due to inconsistency, and one chose not to answer the question, therefore the results are based on how 15 respondents answered. These results also include the euro emission standards of four vans, all either Euro V or Euro VI, but they could not be excluded from the results since it is unknown how many of them belong to which category.

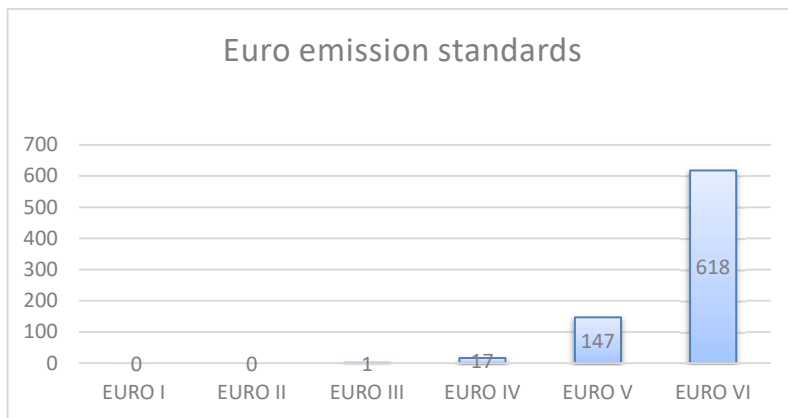


Figure 11. Euro emission standards (pcs)

4.2.3 Height of cargo space

The question on the heights of the vehicles cargo space was left unanswered by 2 companies, and the four companies that had answered inconsistently were also excluded from these results. This means that 14 answered the question. 10 companies reported the heights of all of their vehicles. Out of the remaining four respondents, all had reported less heights than their total amount of vehicles, therefore an assumption was made that since the question was very detailed, some of the companies had answered only on the vehicles heights that they were sure of. Because of this, information on the inner heights of 225 vehicles is missing from the results.

The most common height of the cargo space is ranging from 2,6 to 2,7 meters (see fig. 12). This is because many of the bigger companies use these kinds of vehicles. When

looking at the results of only the medium sized companies with 10-50 vehicles, the most common heights are the ones ranging from 2,9 to 3 meters and over 3 meters (see fig. 13)

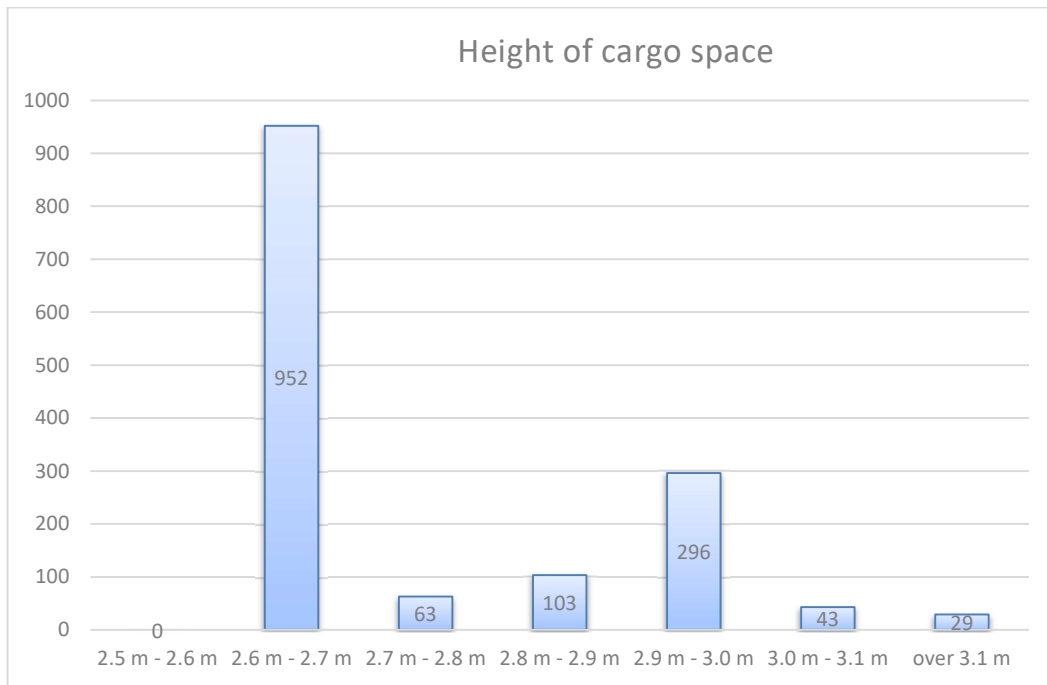


Figure 12. Height of cargo space, all companies (pcs)

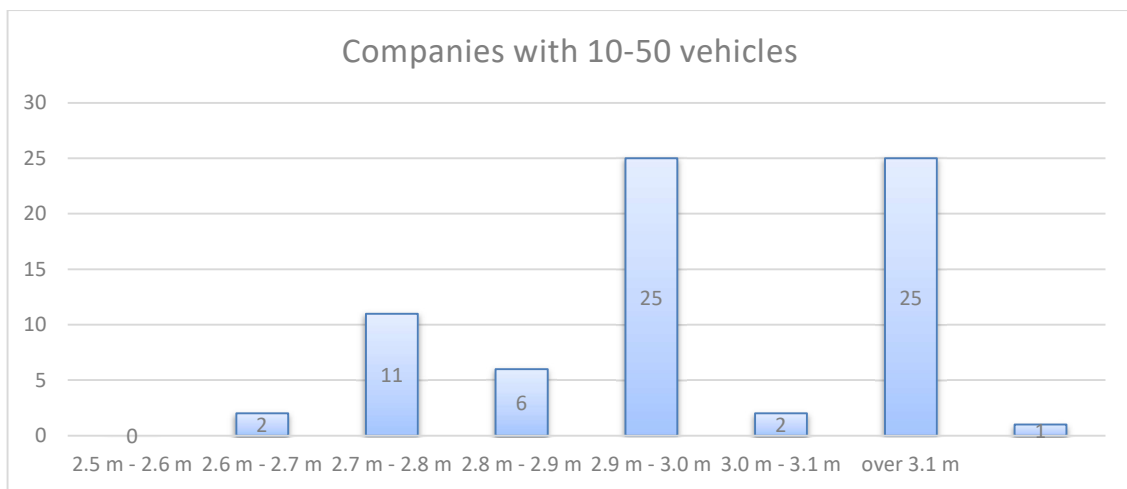


Figure 13. Height of cargo space amongst companies with 10-50 vehicles (pcs)

4.2.4 Alternative fuels

When it comes to alternative fuels, the most common amongst Bewi Insulation’s subcontractors is biodiesel, which is used by five companies. Some companies use several different alternative fuels. However, the majority of the respondents do not use alternative fuels at the moment (see fig. 14). The ones who do use them, were also asked to give an estimate on the share of them, but the question was only answered by two companies so there are no such results to present. A respondent commented that one reason their company do not use alternative fuels is that their customers are not willing to pay for it. Another respondent had similar thoughts and commented “Using alternative fuels create extra costs, are the transport customers ready to pay for it?” One respondent mentioned that their company is willing to use biodiesel if a customer demands it.

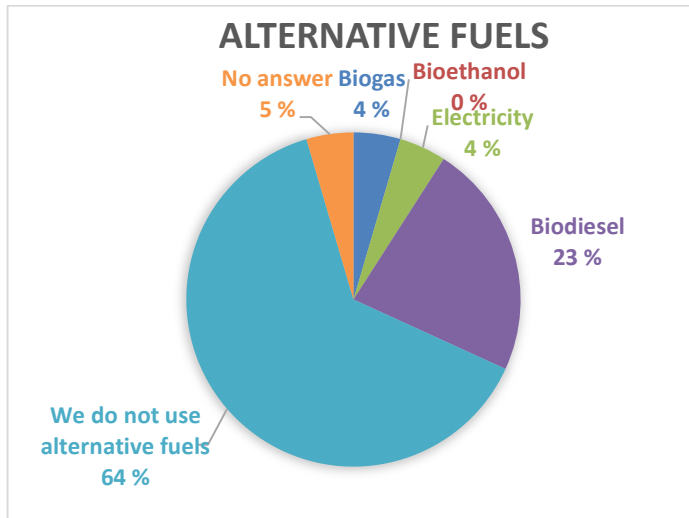


Figure 14. Alternative fuels

4.2.5 Investments

18 companies out of 20 are investing in new vehicles within two years. The majority is investing in conventional diesel vehicles, and vehicles with more cargo space (see fig. 15). The categories can also overlap. Three of the respondents did not specify the extents of their upcoming investments, but amongst the ones who did, the majority is renewing approximately 10-20% of their current vehicles. Amongst the respondents who chose to

answer ‘other’, only one specified what they are investing in. In their case, the upcoming investment concerns more trailers.

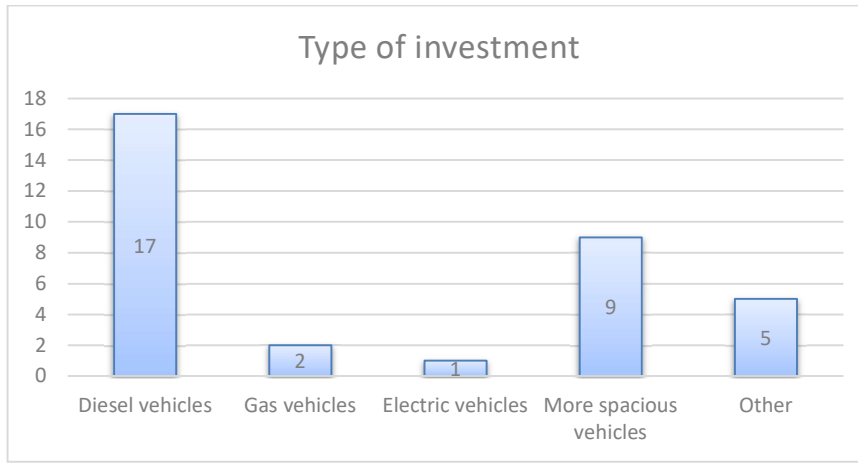


Figure 15. Number of companies / type of investment

4.3 Environment and energy efficiency

The second part of the questionnaire was called ‘Environment and energy efficiency’ and the results on this topic are presented below.

4.3.1 Fuel consumption

The most common way of monitoring fuel consumption amongst the respondents, is to follow it up on a vehicle level, which 18 out of the 20 respondents stated that they do (see fig. 16). One of the respondents reported that fuel consumption is not monitored in their company. Figure 17 shows that the majority of the companies monitor their fuel consumption on several levels.

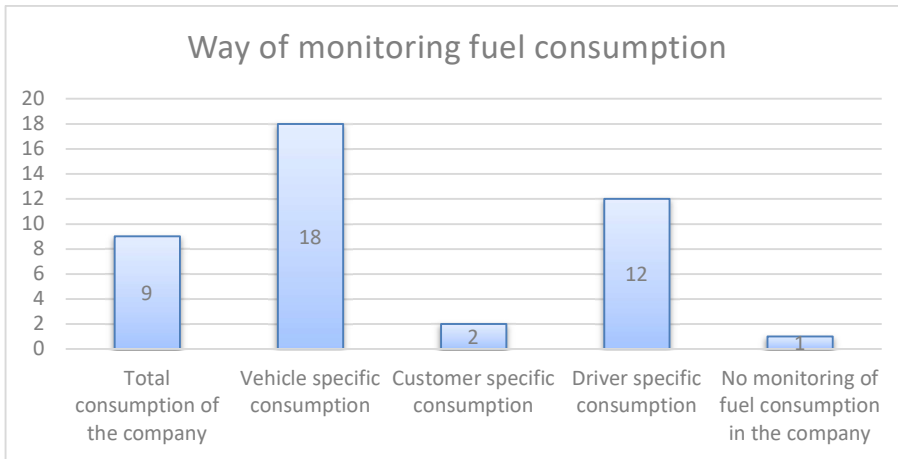


Figure 16. Way of monitoring fuel consumption

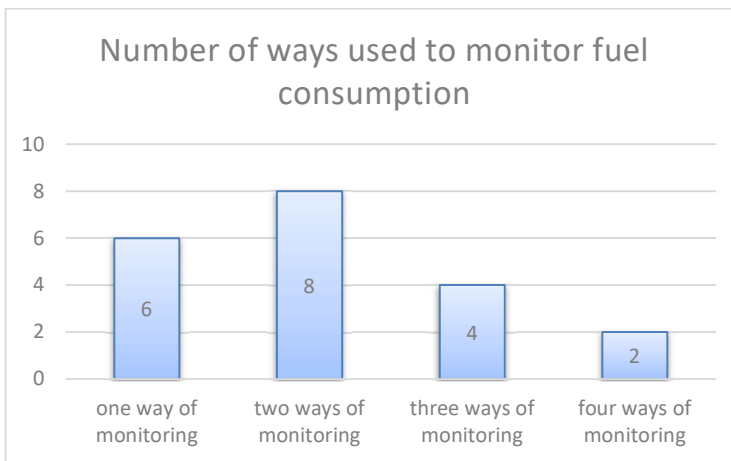


Figure 17. Number of ways used to monitor fuel consumption

4.3.2 Empty miles and total haulage

When estimating the share of empty miles of all transports, the majority of the companies estimate a share ranging between 10 and 20% (see fig. 18). Two of the respondents chose not to answer this question. One respondent commented “Empty miles could be significantly reduced if it would be possible for the customers to be more flexible when it comes to the time of delivery”.

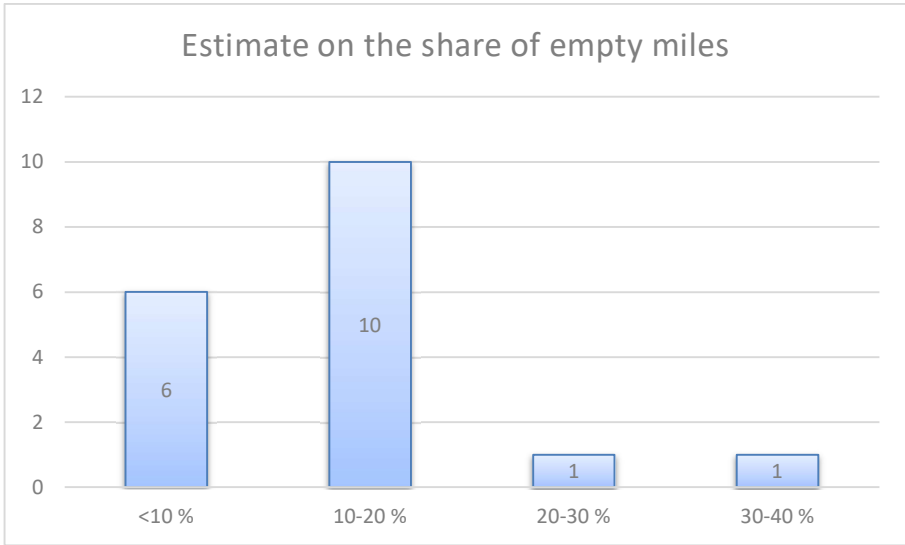


Figure 18. Number of companies / estimate on the share of empty miles

Most of the respondents report that they are following up tonne-kilometers to monitor their total haulage (see fig. 19). 16% do not monitor it in any way. One fifth state that they monitor it in some other way. Other ways are for instance following up the number of orders or turnover or following up the vehicle fill percentage, which indicates how well a vehicle’s load space is being utilized.

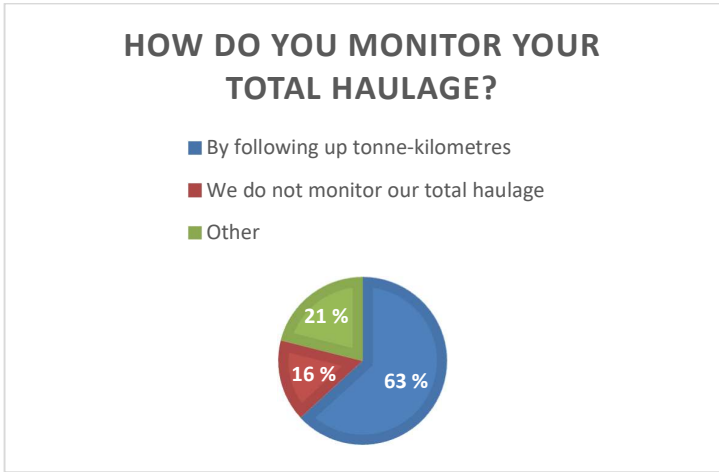


Figure 19. Total haulage

4.3.3 CO₂ emissions

How often the companies follow up their carbon emissions vary quite a lot. 6 of the respondents left this question unanswered. The majority state that they follow up their emissions on a monthly basis, and some do it every quarter. One respondent also reported that they do it whenever a customer asks for information on CO₂ emissions regarding their transports. 10 out of the 14 respondents who stated that they do follow up their CO₂ emissions, did not report their last results. Two companies stand out in a positive way, having given very specific answers on how often they follow up their emissions, and also reporting the exact results of their last follow-up.

4.3.4 Actions to improve energy efficiency

The questionnaire included a section about actions taken to improve energy efficiency of transports. The section consisted of four statements on different actions. Six of the respondents answered 'Strongly agree' to both the statement that they have renewed some of their vehicles, and that they have renewed all of their vehicles during the last 12 months. Therefore these six answers have been excluded from the results since it is impossible to know which of these statements is true.

The results of this section are presented in two separate figures, since the first part (see fig. 20) presents the answers of 14 respondents and the second, of all 20 respondents (see fig. 21).

The vast majority, 12 out of 14 respondents, stated that they have renewed some of their vehicles during the last 12 months (see fig. 20). All 20 respondents report that they have actively been optimizing their vehicles' filling levels, and around half of the respondents have invested in a route optimization software during the last 12 months (see fig. 21).

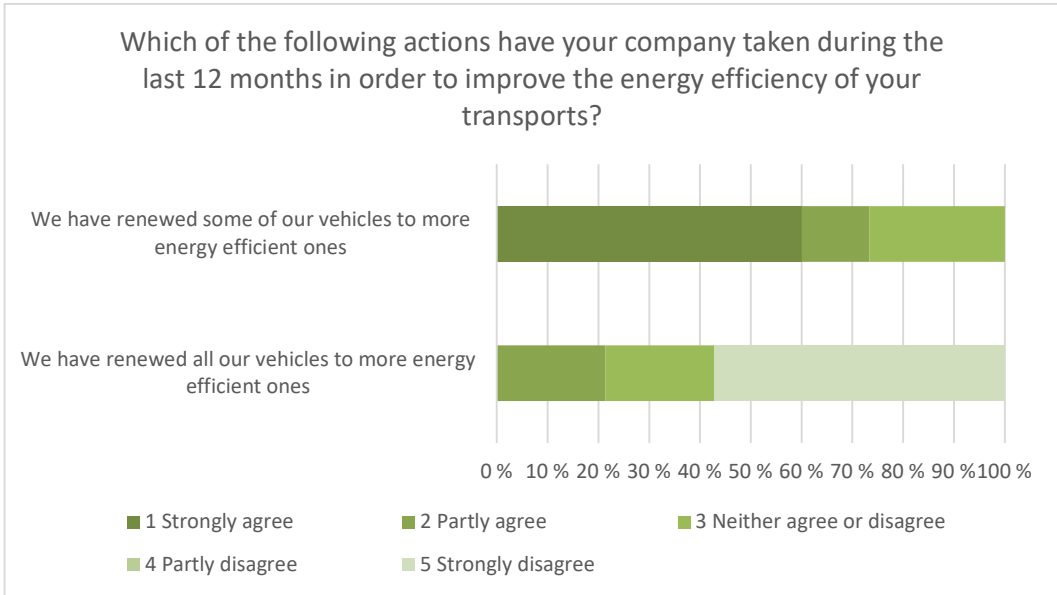


Figure 20. Renewing of vehicles

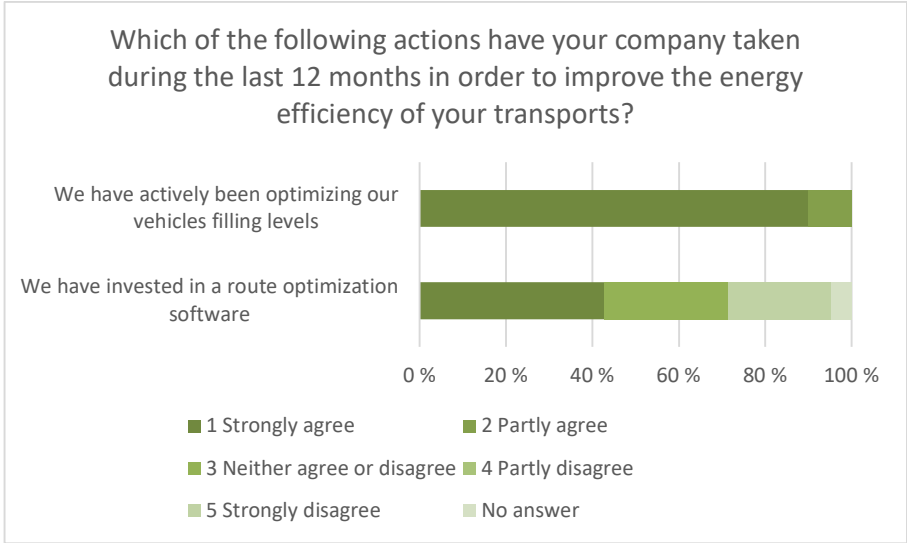


Figure 21. Filling levels and route optimization

4.4 Sustainability strategy

70 % of the respondents report that they do in some extent have a sustainability strategy in their company, while 10 % state that they do not have one (see fig. 22). Almost 90 % of the respondents who have a sustainability strategy also feel that the strategy is visible in their daily operations.



Figure 22. Sustainability strategy

4.5 Actions to reduce emissions

The questions in this section were answered by all of the respondents. The vast majority agreed on the statement that environmental damage and emissions caused by road freight need to be reduced in the future (see fig. 23). However the majority felt that the emission reduction targets set by the government are too ambitious. One of the respondents commented: “First, realistic instructions on how to reach a target should be given, instead of a target being set and afterwards you start thinking about how it could be reached”.

Over half of the respondents feel that the sustainability target of reaching a level of zero emissions by the year 2045 is achievable, while 30% see it as unrealistic. The majority of the respondents feel that different actions such as introduction of new technology, the use of legislative restrictions and of financial means of control are acceptable ways to reduce emissions. “However this does not necessary mean that they are sufficient enough”, one of the respondents commented.

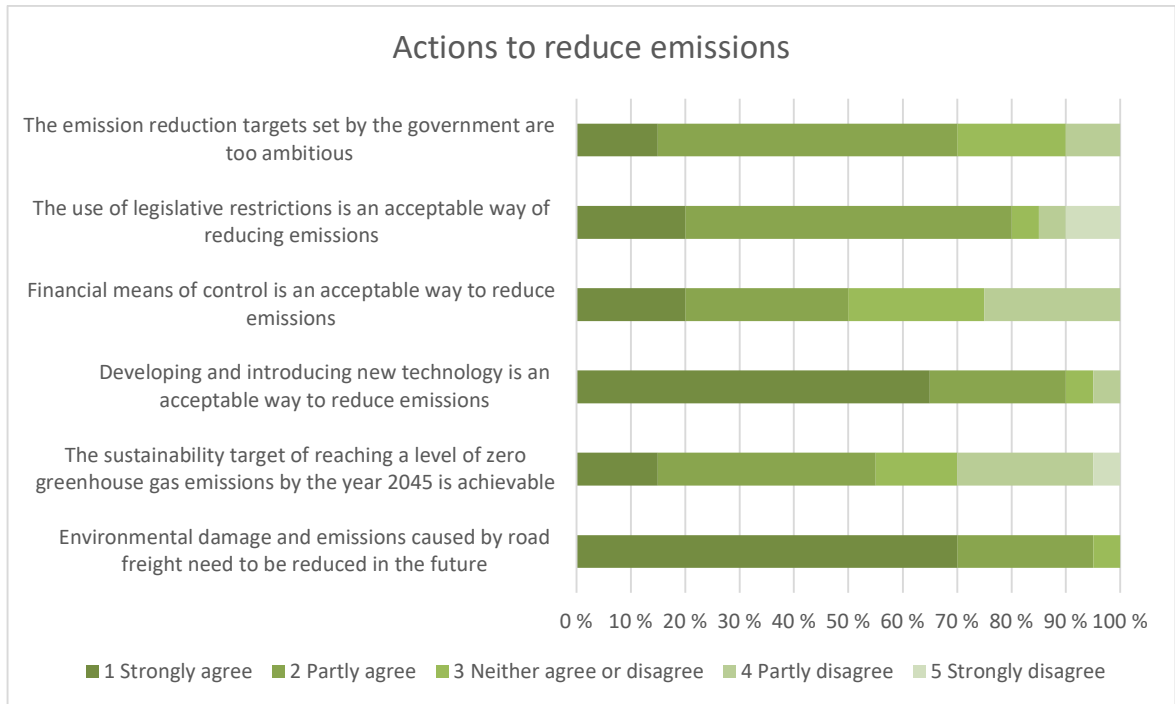


Figure 23. Actions to reduce emissions

4.6 Green transport

The questions in this section were answered by all of the respondents. Half of the respondents report that their company strives to be pioneers when it comes to green transport (see fig. 24). In 90% of all companies, the drivers have been trained into using a fuel-efficient driving style and in the majority of all companies, the development of electric heavy goods vehicles is actively followed.

14 of the respondents feel that it is not mostly a question of attitude when moving towards a use of alternative fuels. The alternative fuels available on the market at the moment are not considered cost efficient by the majority of the respondents. However, over half of them still state that they are aiming to increase the use of alternative fuels in their company over the next few years. 50% of the respondents feel that there are suitable alternative fuels on the market to meet the needs of their company, while 45% feel there are not.

Everyone agreed on the statement, that optimizing filling levels is a good way to reduce emissions. How hard it is to improve the filling levels in practice, is experienced

differently between the companies. 50% feel it is challenging, while 45% do not see it as problematic.

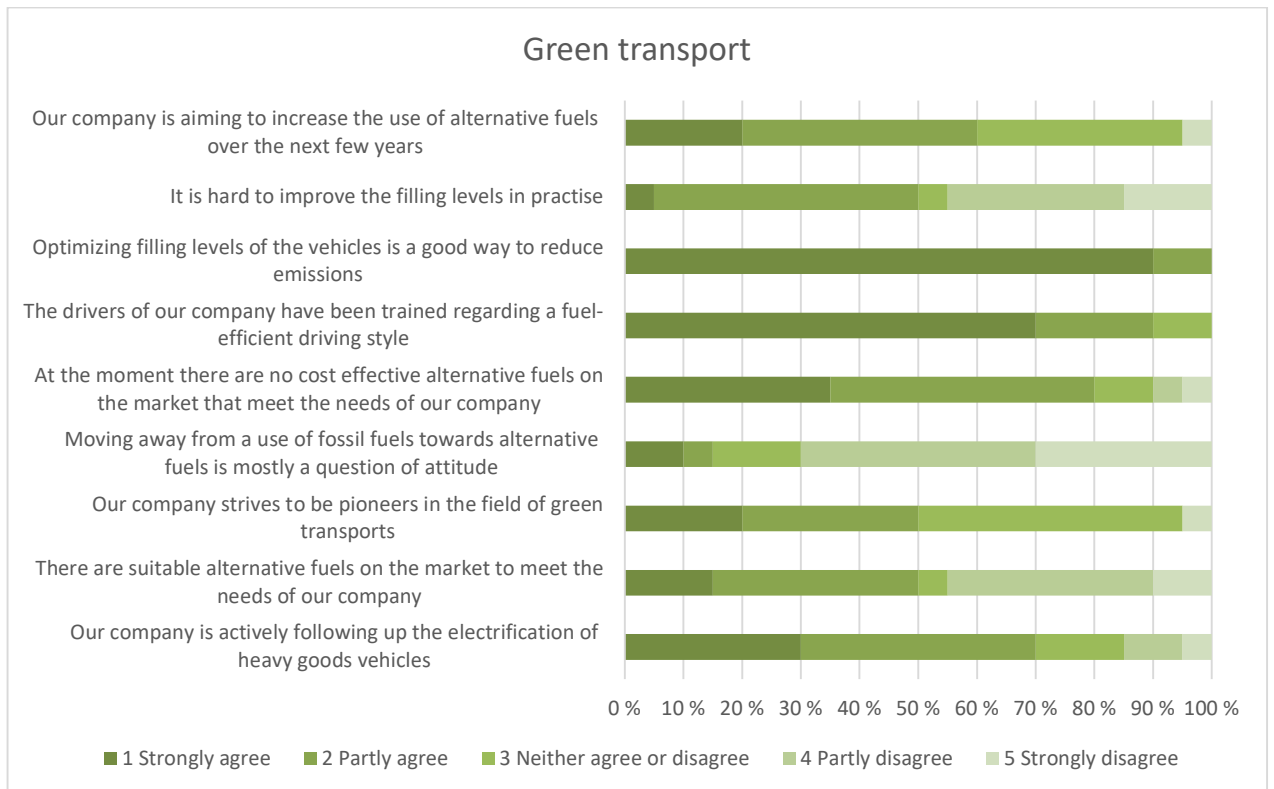


Figure 24. Green transport

4.7 Green index

When going through the results of the study, some answers were identified as of higher relevance and importance than others, since they provide information directly connected to the research questions. The key concept of this study is green transport, since the aim is to map the subcontractors to find out their level of engagement in it. How they look at the future is also of interest. The questions listed below are therefore the ones considered most important:

- Euro emission standards of the vehicles
- Use of alternative fuels today and plans for the future
- Upcoming investments
- Is there an environmental management system in use?

- Does a company have a sustainability strategy, and is it visible in the daily operations?
- Empty miles and filling levels
- Following up CO₂ emissions
- Have the drivers been trained to use a fuel-efficient driving style?

The answers to these questions, have been coded, so that answers that indicate a low level of engagement in green transport give low points, and a high level of engagement, higher points. The maximum points per question is five points and the minimum, if a question is left unanswered, zero points.

The points from all these questions added together, gives a maximum of 60 points. There are variations on how Bewi Insulation’s subcontractors have answered. The highest points a company gained was 51 points, while the company with the lowest points gained a total of 20 points (see fig. 25).

The purpose of making a ‘Green Index’ is to more clearly see how actions and future plans differ amongst the subcontractors. By rating the answer options, and calculating a sum, it is possible to rank the respondents on how “green” they are.

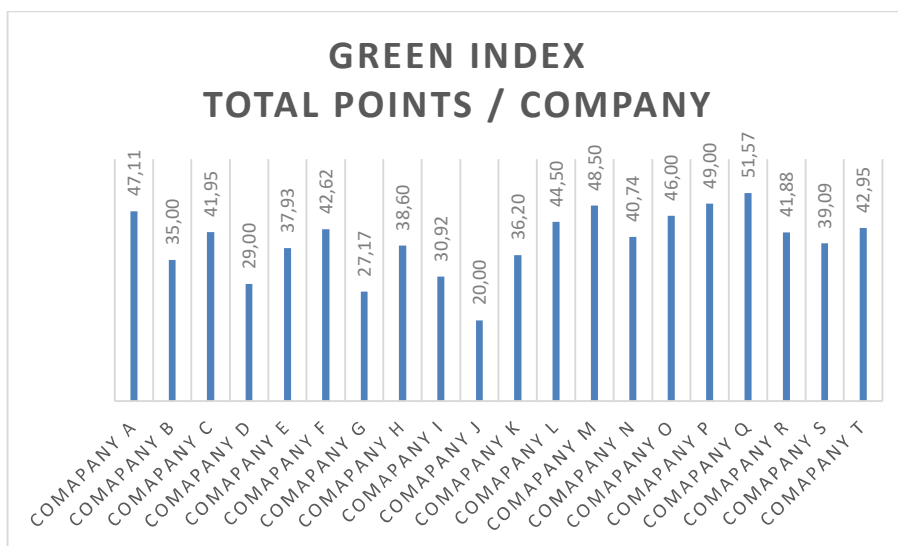


Figure 25. Green Index - Distribution of points between the subcontractors

4.8 Attitudes Index

The questionnaire also collected data on attitudes towards green transport. Data on the attitudes was collected in the fourth and fifth section of the questionnaire, where the respondents were asked to express their opinions to the following statements:

- The emission reduction targets set by the government are too ambitious
- The use of legislative restrictions is an acceptable way of reducing emissions
- Financial means of control is an acceptable way to reduce emissions
- Developing and introducing new technology is an acceptable way to reduce emissions
- The sustainability target of reaching a level of zero greenhouse gas emissions by 2045 is achievable
- Environmental damage and emissions caused by road freight need to be reduced in the future
- Our company is actively following up the electrification of heavy goods vehicles
- Our company strives to be pioneers in the field of green transports
- At the moment there are no cost-effective alternative fuels on the market that meet the needs of our company

As in the ‘Green Index’, the answer options to the attitude questions have also been coded. All questions have five answer options, which means that a positive attitude on green transport results in higher points and a more negative attitude in lower points, on a scale from one to five. An unanswered question results in zero points. The maximum number of points from the ‘Attitudes Index’ is 55 points.

The ‘Attitudes Index’ helps gaining an insight into the attitudes towards green transport amongst the subcontractors. The index is also needed for the correlation test which will evaluate if there is a relationship between the attitudes in a company and what they actually have done and are planning to do in the future. The highest points a company gained was 49 points, while the company with the lowest points gained a total of 20 points (see fig. 26).

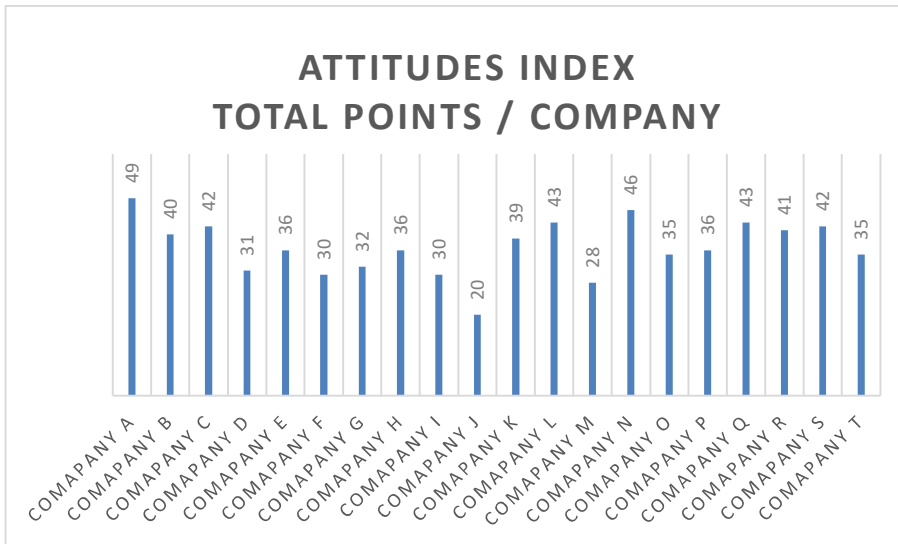


Figure 26. Attitudes Index - Distribution of points between the subcontractors

4.9 Correlation tests

Having created both a ‘Green Index’ and an ‘Attitudes Index’, the aim was then to see if these two correlate. Is there a relationship between the attitudes within a company and what kind of actions they have taken towards becoming greener and the plans they have for the future?

Pearson’s correlation coefficient resulted in 0.49 (see fig. 27) which means that there is a medium strong positive relationship between the two variables (Statistics solutions 2022). These results indicate that there is some kind of relationship between the attitudes and the actions taken regarding green transport in a company. However there are other factors that also affect how a company chooses to operate. The aim of the second correlation test was to find out if there is a relationship between a company’s yearly turnover and actions taken, in combination with future plans regarding green transport.

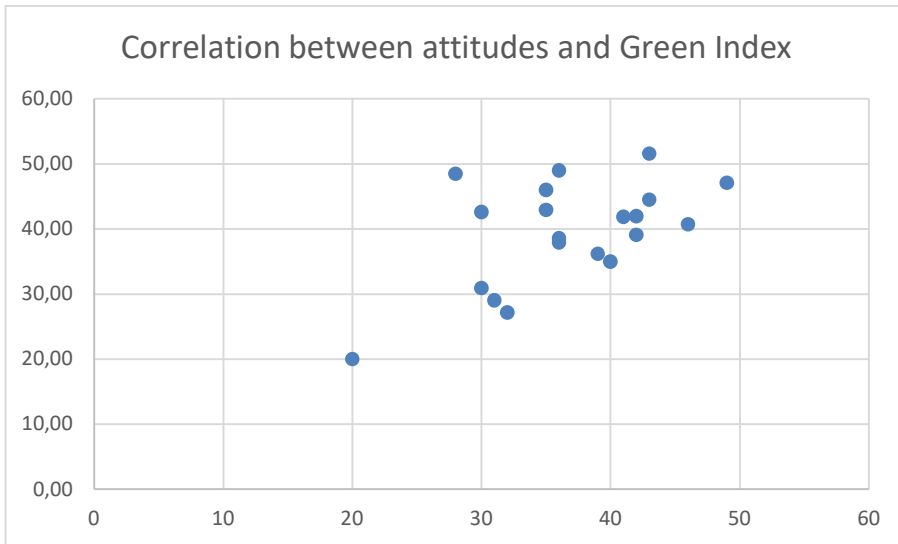


Figure 27. Correlation between attitudes and Green Index

A correlation test between a company's yearly turnover and their 'Green Index' score resulted in a Spearman's correlation coefficient of 0.74, which indicates that there is a strong positive relation between the two variables. (see fig. 28)

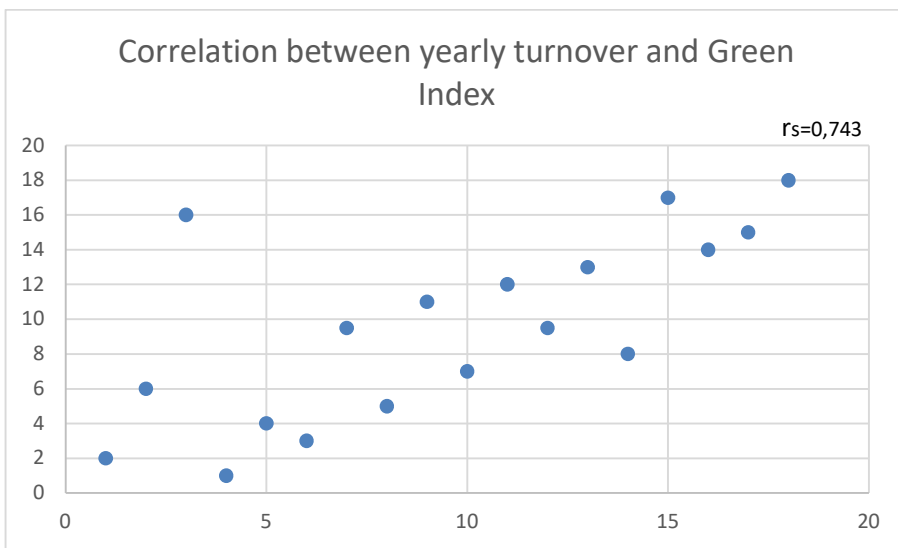


Figure 28. Correlation between yearly turnover and Green Index

5 DISCUSSION

The aim of the study was to map Bewi Insulation's subcontractors on how green their transports are. In this chapter the results of the empirical study are analyzed in relation to the theoretical frame. The method is also discussed.

5.1 Discussion of results

The first correlation test showed that there is a medium strong relationship between actions taken in a company and attitudes towards green transport. The attitudes towards green transport amongst the subcontractors of Bewi Insulation is generally on a good level. Even if there are variations between the subcontractors' attitudes, with points ranging from 20 to 49, (see fig. 26) only two of the respondents gained under 30 points. This means that the real variation is not that big and therefore the attitudes towards green transport on the whole are very positive. The fact that a relationship was found between the two variables is a good thing for Bewi Insulation. This shows that a company with a positive attitude, already has started their journey towards a greener transport and will probably also continue on that road in the future. This will help Bewi Insulation on their way towards achieving their own sustainability goal.

When comparing the results of the 'Green Index', there are bigger variations between the subcontractors. The second correlation test showed that there is a strong positive relationship between a company's yearly turnover and their 'Green Index' score. What a company has done and is planning to do in the future regarding green transport seems to be more a question of resources than a question of attitude. This means that a company with a higher yearly turnover probably has more resources to invest more in green transport than a company with a lower turnover. Even if the variations between the subcontractors are bigger when it comes to the 'Green Index' than the variations in the 'Attitudes Index', the results are still on a good level, and many important actions have already been taken amongst the subcontractors in order to reduce the negative environmental impact of their operations.

The majority of the respondents state that they have a sustainability strategy, and that it also is visible in their daily operations. Having a sustainability strategy indicates that a company is willing to do its part so that shared sustainability targets set on a higher level will be possible to reach. A sustainability strategy can vary quite a lot since the core targets can belong to any of the three pillars of sustainability. However an assumption was made that when it comes to transport companies, the strategy probably includes emission reduction targets. This is a positive thing from Bewi Insulation's point of view, since it is in line with how they look at sustainability in their company. A subcontractor that has sustainability goals of their own, will probably also make it easier for Bewi Insulation to achieve theirs.

The fact that 40% of the respondents state that they use an environmental management system shows that becoming greener is considered important amongst many. A company that uses an environmental management system commits to an environmental policy (EPA 2021). A policy like this, sets goals to reduce a company's negative impact on the environment.

To which extent vehicles are being loaded, is strongly connected to the carbon footprint of road freight transport (McKinnon et al. 2010 p.63). All of the respondents stated that optimizing filling levels is something they do. Everyone also felt that it is a good way to reduce emissions. The fact that all of the subcontractors focus on it is a good thing for Bewi Insulation since they strive for a reduction of emissions.

Most of the respondents estimated a percentage of under 20% of their total transport work, when it comes to empty miles. One of the respondents commented that a percentage of around 20% is usually seen as a standard in the transport industry. When a vehicle has no load, it still emits around two thirds of the CO₂ emissions that a fully loaded vehicle emits. (McKinnon et al. 2010 p.63). It seems that avoiding empty miles is experienced important and something most of the subcontractors put emphasis on, since most of them estimated such a low percentage.

Optimizing filling levels and trying to minimize empty miles is however not something a transport company strives for only to reduce emissions. Focusing on these things is also directly connected to the profitability of a company.

The vast majority of all vehicles amongst the subcontractors are of EURO VI, which is the latest euro class. This is probably because it is common amongst transport companies to renew the vehicles every few years, therefore many of vehicles registered earlier than 2013 have already been taken out of traffic. From Bewi Insulation's point of view, even if there are data missing due to inconsistent answers, the situation on this front looks quite good.

The results also showed that the majority is investing in new vehicles within two years, however most of all planned upcoming investments still concern conventional diesel vehicles. This supports the statement that a widely spread use of alternative fuels in the field of logistics is still at a very early stage (Evans et al. 2020 p. 19). However, over half of the respondents still state that they are aiming to increase their use of alternative fuels over the next few years, it is though not happening as fast as within the next two years.

It has been estimated that both electric heavy goods vehicles, and gas-fuelled vehicles will increase on the roads of Finland by the year 2030 (Valtioneuvosto 2021). Amongst Bewi Insulation's subcontractors, this is not yet seen. The reasons to this is probably that the refuelling infrastructure still needs to be developed, so that using alternative fuels is considered as easy and convenient as using fossil fuels. Alternative fuels are also more expensive compared to conventional diesel. As some of the respondents commented, using more sustainable alternatives usually also means higher costs, and as it is today, no one seems to be ready to pay for it. Therefore, as the expert group that works under the Ministry of Transport and Communication suggests, one way of getting more people to invest in more sustainable vehicles could be to offer them financial support (Valtioneuvosto 2021).

The results of this study are not generalizable, but if similar actions are taken in other transport companies, and the same positive attitudes exist within the companies as well,

it will have a positive effect trying to achieve the environmental targets set both by the government of Finland and by the European Union.

5.2 Discussion of method

The method chosen for this study, a self-completed questionnaire, was successful. The response rate was a bit over 70%, which is considered excellent (Willott 2019). However, four questions concerning the vehicles caused some problems, when four of the respondents answered inconsistently. The reason to this might be that the questions required very specific details, which created difficulties for the respondents. The answers given by the four companies to these four questions, were excluded from the results, which reduces the reliability to some extent.

The question about the use of subcontractors, might have been interpreted differently between the respondents. One respondent commented that it is very common in the transport business that companies always use subcontractors, since none of their drivers come from inside the company, and so was also the case in the respondent's company. But when it comes to vehicles, they mostly use their own. So, when forming the question, the writer should have been more specific. In this case, of interest was if Bewi's subcontractors also use vehicles that are not owned by themselves. The mistake was made due to lack of knowledge on how things work in the transport business. This will reduce the reliability of the study a bit, since it is unknown how a respondent have interpreted the question.

The questions that collect data on the attitudes towards green transport are a bit vague, and there should probably have been more of them. Therefore the validity of the 'Attitudes Index' suffers, and this is something Bewi needs to take into account when deciding who to cooperate with. However the indication that the attitudes mainly are positive amongst the subcontractors can still be trusted.

6 CONCLUSIONS

This study was conducted on behalf of Bewi Insulation. One of their sustainability targets, is to have 50% of all transports carried out by vehicles using non-fossil fuels, by 2030

(Bewi 2020 p.11). The aim of the study was to map Bewi's subcontractors on green transport. The research questions it aimed to answer were:

- What are the subcontractors attitudes towards green transport?
- What are the subcontractors doing today and what are their plans for the future?
- Is there a relationship between the attitudes towards green transport and actions taken and future plans?
- Is there a relationship between a company's yearly turnover and actions taken combined with future plans?

The situation amongst Bewi Insulation's subcontractors today, is that most of them do not use alternative fuels. Many find that suitable options for their businesses are missing at the moment, and that alternative fuels are not cost-efficient. However, some of the companies have already started using alternative fuels, and even use several different types of alternative fuels.

Other actions that also already have been taken amongst the subcontractors are for instance that 70% of the respondents have a sustainability strategy of their own. This will probably help Bewi achieve their own goal of having 50% of all transports carried out by vehicles using non-fossil fuels by 2030.

The majority of all vehicles are also of the latest euro class. Actively optimizing the filling levels of the vehicles and really putting an effort on avoiding empty miles, are things the majority focuses on. These actions show that the subcontractors already are considering many important factors of green transport in their daily operations.

Regarding the future, when the subcontractors were asked about their upcoming investments, almost everyone had plans to invest in new vehicles within two years. The majority were planning to invest in conventional diesel vehicles. One of the respondents commented that they renew their vehicles every few years, which means that a lot will still happen before 2030. Over half of all respondents stated that they are planning to increase their use of alternative fuels over the next few years.

Based on the results of the 'Attitudes Index', the attitudes towards green transport amongst the respondents are mainly positive. These positive attitudes, in combination with the ongoing development in the field of alternative fuels is probably going to result in a more widely spread use of alternative fuels amongst the subcontractors by the end of this decade.

The results show that there are differences between the subcontractors actions and attitudes towards green transport. The variation between the companies is a bit smaller when it comes to the attitudes.

One of the correlations this study tested, was if there was a relationship between the attitudes towards green transport and what already had been done in a company together with their future plans. The results showed a medium strong positive relation; however, a stronger positive relation was found between a company's yearly turnover and their actions taken in combination with their future plans. This means that engagement in green transport seems to be more a question of resources than a question of attitude.

The conclusion of this study is that the level of engagement in green transport amongst Bewi Insulation's subcontractors is on a good level. There are differences between the subcontractors in both attitudes and actions taken, so depending on who Bewi chooses to cooperate with, their sustainability target is probably being achieved earlier with some than with others but achieving their sustainability target of having 50% of their distribution handled by vehicles fueled with non-fossil fuels by 2030 should not create problems. This conclusion is based on the fact that the current state looks good amongst the subcontractors, both when it comes to actions already taken, and the positive attitudes towards green transport that exists amongst them. These two, combined with the ongoing development of alternative fuels, will probably result in a more widely spread use of alternative fuels amongst the subcontractors by 2030.

6.1 Limitations of the study

There are some limitations that should be considered regarding this study. The aim was to reach out to all of Bewis 28 subcontractors, but the questionnaire was answered by 20. This means that there are results missing on eight of Bewi Insulation's subcontractors.

The fact that many of the subcontractors state that they use subcontractors of their own, also brings uncertainties to the results, since it is unknown how green their actions are. Another limitation is the fact that the respondents in a way are dependent of Bewi Insulation. This might tempt them to answer in a more positive manner.

Looking back at the whole process, it is now easier to see the big picture. In the design phase of the questionnaire, the writer should have thought of how the results will be analyzed, to a greater extent. In particular when it comes to the questions that measure the attitudes towards green transport. There should have been more statements, and more check questions to increase both the reliability and validity of the study.

6.2 Suggestions for further studies

In this study a quantitative method was used. A qualitative method, for instance interviewing some of the respondents could provide a deeper understanding of the reasons why certain choices are made in a company. Since the questions that collected data on the attitudes towards green transport were a bit vague in the questionnaire, an interview could provide more reliable results regarding them.

Since this study served as an initial mapping of Bewi Insulation's subcontractors, it could be a good idea to follow up the situation for instance in two years, to see how the development is going.

Since the majority of Bewi's subcontractors also use subcontractors of their own, one idea for further studies could be to find out how green their operations are.

7 SAMMANFATTNING

7.1 Inledning

Vi har nått en punkt där vi alla behöver engagera oss och gemensamt arbeta mot ett och samma mål, nämligen målet att minska på utsläpp. Vår planet värms upp i en allt snabbare takt, på grund av mänsklig aktivitet då vi förbränner fossila bränslen. Utsläpp som exempelvis koldioxid (CO₂) samlas i atmosfären, och förhindrar solstrålarna som når jordens yta att reflekteras tillbaka ut i rymden. Detta leder till växthuseffekten och vidare till den globala uppvärmningen. Den globala uppvärmningen medför allvarliga problem som till exempel extrema väderförhållanden och smältning av polarisarna. (Nasa 2021)

I EU är transportsektorn ansvarig för 25 % av alla koldioxidutsläpp varav vägtransporten är den största boven. År 2014 härstammade 70 % av alla växthusgaser enbart ifrån vägtransporten. (European Commission 2021a)

På grund av allt större miljömedvetenhet har det både på EU-nivå samt på nationell nivå lagts upp miljömål för att minska på skadliga utsläpp. Dessa miljömål tvingar företag att börja tänka på hur deras verksamhet påverkar miljön samt hur den kunde bli miljövänligare. Inom företaget Bewi Insulation handlar ett av miljömålen om att 50 % av deras transporter skall skötas av fordon drivna med fossilfritt bränsle. Detta mål är ämnat att nås senast år 2030. Bewi Insulations transporter sköts av transportbolag som fungerar som deras underleverantörer.

Denna studie utförs för Bewi Insulation. Syftet med studien är att kartlägga Bewis underleverantörer för att se hur gröna deras transporter är. Forskningsfrågorna som studien ämnar svara på är:

- Hur ser underleverantörernas attityder ut gentemot grön transport?
- Vad gör de idag och hur ser deras planer ut inför framtiden?
- Finns det ett förhållande mellan attityderna inom ett företag och vad man gjort och planerar göra i framtiden med tanke på grön transport?
- Finns det ett förhållande mellan ett företags årliga omsättning och vad man gjort och planerar göra i framtiden med tanke på grön transport?

Bewi Insulation är ett tillverkande företag som hör till den norskägda koncernen Bewi Group. Bewi Insulation har produktionsenheter i tre städer i Finland. De ligger i Kaavi, Tarvasjoki och Ruukki. Bewi Insulations huvudprodukter är isoleringsskivor av materialet polystyren. Dessa används bland annat inom husbygge. Största delen av kunderna är inhemska och produkterna levereras till kunderna med tunga transportfordon. Majoriteten av alla transporter sköts av underleverantörer.

7.2 Teori

För att förstå orsaken till att företag har börjat lägga upp hållbarhetsstrategier och miljömål, tar teorikapitlet upp den globala uppvärmningen. Kapitlet behandlar också olika initiativ som tagits längs med åren för att försöka få ett stopp på den globala uppvärmningen.

Det är viktigt att veta vilka miljömålen är både på EU nivå, samt på den nationella nivån i Finland. Detta möjliggör en förståelse i när företag behöver börja agera, och hur lång tid de har på sig för att nå sina egna mål. Därför presenteras också dessa miljömål i detta arbete. Eftersom begreppet grön transport är det centrala begreppet i denna studie presenteras även de olika faktorerna som påverkar hur grön en transport är. Dessa är: Typ av fordon samt fordonets EURO klass, hur ofta ett företag uppföljer sina CO₂ utsläpp som uppstått genom transporter, användning av alternativa bränslen, minimering av tomma mil och optimering av fyllnadsgrader samt användning av ett miljöledningssystem. Slutligen ges också en inblick i Bewi Insulations hållbarhetsstrategi.

7.3 Metod

Denna studie använder sig av en kvantitativ metod i form av en enkätundersökning. Målet är att med hjälp av resultatet kunna beskriva respondenterna. Syftet är också att vidare se ifall det hittas samband mellan variabler. Det är av intresse ifall attityder gentemot grön transport korrelerar med de åtgärder man tagit, och planerar ta i framtiden inom ett företag. Ett annat möjligt samband av intresse, är ifall den årliga omsättningen korrelerar med de åtgärder som tagits och planerar tas i framtiden.

Respondenterna i studien är 28 företag som för tillfället fungerar som Bewi Insulations underleverantörer. Oftast då det handlar om en kvantitativ studie är det omöjligt att nå ut till en hel population. Därför får ett sampel svara på enkäten och deras resultat får sedan representera hela populationen. I detta fall nås hela populationen, och därav är målet inte att kunna generalisera resultaten, utan i stället enbart att beskriva hur populationen svarat.

Enkäten kartlägger gröna transporter och distribueras digitalt. Den består av sex delar och innehåller frågor om följande teman:

- Fordon
- Miljö och energieffektivitet
- Hållbarhetsstrategi och underleverantörer
- Åtgärder för att minska på utsläpp
- Grön transport
- Bakgrundsinformation

7.4 Resultat

I detta kapitel ges en kort beskrivning av respondenterna. Vidare förklaras grönhets- samt attitydindexet. Slutligen presenteras också resultaten av korrelationstesten. Noggrannare beskrivning över hur respondenterna svarat på samtliga frågor i enkäten fås ur figurerna i kapitel 4 (se fig. 6 – 24).

7.4.1 Presentation av respondenterna

Av de 28 underleverantörer som studien ämnade nå ut till, svarade 20 på enkäten. Storleken av personalstyrkan i respondenternas företag varierar mellan ett fåtal personer till långt över 100. Majoriteten av företagen har dock mellan 20 och 100 arbetare, (se fig. 6) och en årlig omsättning på omkring 10 miljoner euro (se fig. 7). Största delen av respondenterna uppger att de använder sig av egna underleverantörer. Hur ofta, och till hur stor utsträckning, varierar mycket mellan företagen (se fig. 8). Åtta av företagen använder sig av miljöledningssystemet ISO 14001.

7.4.2 Grönhetsindex och attitydindex

En del av resultaten identifierades som mer relevanta än andra, eftersom de bidrog med information direkt länkat till forskningsfrågorna. Det centrala begreppet i denna studie är grön transport, eftersom syftet är att kartlägga underleverantörerna för att få reda på hur gröna deras transporter är. Underleverantörernas framtidsplaner är också av intresse. Därav ansågs följande frågor som viktigast:

- Fordonens EURO klasser
- Användning av alternativa bränslen idag och planer för framtiden
- Kommande investeringar
- Användning av miljöledningssystem
- Hållbarhetsstrategi och dess synlighet i den dagliga verksamheten
- Tomma mil och fyllnadsgrader
- Uppföljning av koldioxidutsläpp
- Chaufförernas utbildning i sparsam körning

För att tydligare se skillnaderna mellan hur respondenterna svarat, skapades ett grönhetsindex (se fig. 25). Svartalternativen till de ovannämnda mest relevanta frågorna kodades, så att svar som tyder på en låg nivå av engagemang i grön transport ger låga poäng och svar som tyder på högt engagemang ger höga poäng. Poängen gavs på en skala mellan noll och fem poäng, där en obesvarad fråga resulterade i noll poäng. Högst antal poäng som kunde uppnås var 60 poäng. Mellan Bewis underleverantörer varierade de totala poängen mellan 20 och 51 poäng (se fig. 25).

Enkäten samlade också in data om attityder gentemot grön transport. Dessa frågors svarsalternativ kodades också, och resultatet blev ett attitydindex. Högst antal poäng i detta index är 55 poäng. Det fanns variationer i hur underleverantörerna svarade, och resultaten kan ses i figur 26.

Korrelationstest

Efter att ha skapat ett grönhetsindex och attitydindex var följande steg i processen att se ifall dessa två korrelerar. Finns det ett samband mellan attityderna gentemot grön

transport och vilka åtgärder som tagits i ett företag och hur man ser på framtiden? Resultatet visade på en medelstark positiv korrelation, då Pearsons korrelationskoefficient resulterade i 0,49 (se fig. 27). Detta betyder att där finns ett visst samband, men det finns även andra faktorer som har större betydelse.

Syftet med det andra korrelationstestet var att utreda ifall det finns ett samband mellan storleken av ett företags årliga omsättning och företagens grönhetsindex. Spearmans korrelationskoefficient resulterade i 0,74 vilket tyder på ett starkt positivt samband (se fig. 28). Detta betyder alltså att de åtgärder man tagit i ett företag och planerar ta i framtiden, då det handlar om grön transport, verkar vara mer en fråga om resurser än om attityder.

7.5 Slutsats

Syftet med denna studie var att kartlägga Bewis underleverantörer gällande grön transport. Forskningsfrågorna arbetet ämnade svara på var följande:

- Hur ser underleverantörernas attityder ut gentemot grön transport?
- Vad gör de idag och hur ser deras planer ut inför framtiden?
- Finns det ett förhållande mellan attityderna inom ett företag och vad man gjort och planerar göra i framtiden med tanke på grön transport?
- Finns det ett förhållande mellan ett företags årliga omsättning och vad man gjort och planerar göra i framtiden med tanke på grön transport?'

Slutsatsen är att nivån av engagemang i grön transport är på en god nivå bland Bewis underleverantörer. Det finns dock skillnader mellan aktörerna både då det handlar om tagna åtgärder och attityder gentemot grön transport. Detta betyder att deras hållbarhetsmål antagligen kommer att kunna uppnås i snabbare takt med somliga samarbetspartners än med andra. Men målet att 50 % av transportererna skall skötas av fordon drivna med fossilfritt bränsle senast 2030 torde vara uppnåbart. Denna slutsats baserar sig på att många åtgärder relaterade till grön transport redan är tagna inom företagen. Dessutom är attityderna över lag positiva. Detta, tillsammans med den aktiva utvecklingen av alternativa bränslen som sker för tillfället kommer antagligen att resultera i att en allt större del av underleverantörerna kommer att börja använda sig av alternativa bränslen.

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APPENDIX 1. QUESTIONNAIRE

KESTÄVÄN KULJETUKSEN KARTOITTAMINEN

Tämän kyselyn tarkoitus on kartoittaa kaikki logistiikkapalvelujen tarjoajat, joiden kanssa Bewi tekee yhteistyötä tällä hetkellä. Kartoitus koskee kestävää kuljetusta ja on osa Bewin ympäristöstrategiaa. Osallistuminen kyselyyn on vapaaehtoista.

Kysely koostuu kuudesta osasta: 1. Kuljetuskalusto, 2. Ympäristö ja energiatehokkuus 3. Ympäristöstrategia ja alihankkijat 4. Toimenpiteitä päästöjen vähentämiseksi 5. Vihreä kuljetus ja 6. Taustatiedot. Kyselyn täyttämiseen kuluu aikaa noin 15 min. Kyselyosioden välillä pääsee liikkumaan kyselyn alaosassa olevien painikkeiden avulla. Kiitän ajastanne ja toivon, että vastaatte parhaanne mukaan kaikkiin kysymyksiin.

Osa A: Kuljetuskalusto

A1. Kuljetuskaluston lukumäärä

Tässä ilmoitetaan ainoastaan yrityksenne oman kaluston suuruus, eikä esimerkiksi mahdollisten alihankkijoiden kalustoa lasketa mukaan.

A2. Mitkä ovat käyttämäne kaluston EURO-päästöluokitukset? Valitse kaikki yritystänne koskevat vaihtoehdot ja ilmoita kyseisen luokituksen lukumäärä kommenttikenttään

EURO I

Kommentti

EURO II

Kommentti

EURO III

Kommentti

EURO IV



Kommentti

EURO V



Kommentti

EURO VI



Kommentti

Ei tiedossa



Kommentti

A3. Mitkä ovat yrityksenne kuljetuskaluston mallit ja määrät? Valitse kaikki yritystänne koskevat vaihtoehdot, ja ilmoita kyseisen mallin lukumäärä kommenttikenttään

Puoliperävaunu



Kommentti

Täysperävaunu



Kommentti

Kuorma-auto



Kommentti

Muu



Muu

A4. Mitkä ovat yrityksenne täysperävaunujen sisäkorkeuksien enimmäismitat? Valitse kaikki yritystänne koskevat vaihtoehdot ja ilmoita lukumäärät kommenttikenttään.

2.5 m - 2.6 m



Kommentti

2.6 m - 2.7 m



Kommentti

2.7 m - 2.8 m



Kommentti

2.8 m - 2.9 m



Kommentti

2.9 m - 3.0 m



Kommentti

3.0 m - 3.1 m



Kommentti

Yli 3.1 m



Kommentti

A5. Mitä vaihtoehtoisia polttoaineita yrityksenne käyttää? Valitse kaikki yritystänne koskevat vaihtoehdot ja ilmoita arvioitu käyttöprosentti kommenttikenttään.

Biokaasu



Kommentti

Bioetanoli



Kommentti

Sähkö

Kommentti

Biodiesel

Kommentti

Emme käytä vaihtoehtoisia polttoaineita

Kommentti

A6. Onko yrityksenne investoimassa uuteen kalustoon?

Kyllä, 1-2 vuoden sisällä

Kyllä, 2-3 vuoden sisällä

Kyllä, 3-5 vuoden sisällä

Kyllä, 5-10 vuoden sisällä

Ei, näillä näkymin emme ole investoimassa uuteen kalustoon

A7. Jos vastasit edelliseen kysymykseen kyllä, voitko täsmentää mihin yrityksesi on investoimassa? Jos yrityksenne ei ole investoimassa voit jättää kysymykset numero 7. ja 8. vastaamatta ja siirtyä kysymykseen numero 9.

Diesikäyttöiseen kalustoon

Kaasukäyttöiseen kalustoon

Sähkökäyttöiseen kalustoon

Tilavampaan kalustoon

Muu

Muu

A8. Kuinka suuri osa nykyisestä kuljetuskalustosta yrityksenne on ajatellut uusiksi? Arvioi parhaasi mukaan ja ilmoita prosentteina (%)

A9. Muuta lisättävää

Tähän saa vapaasti kommentoida jos on lisättävää aiheesta "Kuljetuskalusto"

Osa B: Ympäristö ja energiatehokkuus

B1. Millä tarkkuustasolla polttoaineenkulutuksen seuranta tehdään yrityksessänne?

Yrityksen kokonaiskulutus

Autokohtainen seuranta

Asiakaskohtainen seuranta

Kuljettajakohtainen seuranta

Yrityksemme ei seuraa polttoaineenkulutusta

B2. Mikä sertifioitu ympäristöjärjestelmä yrityksessänne on käytössä?

ISO 14001

EMAS

Ei mikään

Muu

Muu

B3. Kuinka usein yrityksenne seuraa toiminnasta aiheutuvia CO2 päästöjä?

B4. Jos yrityksenne ei seuraa CO2 päästöjä, jätä vastaamatta tähän kysymykseen. Jos seuraatte, ilmoittakaa ystävällisesti edellisen CO2 päästöjen seurannan tulos.

B5. Mitä seuraavista yrityksenne on tehnyt viimeisten 12 kuukauden aikana, parantaakseen kuljetuksenne energiatehokkuutta?

	1 Täysin samaa mieltä	2 Osittain samaa mieltä	3 En samaa enkä eri mieltä	4 Osittain eri mieltä	5 Täysin eri mieltä
Olemme uudistaneet koko kalustoamme energiatehokkaampaan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Olemme uudistaneet osan kalustoamme energiatehokkaampaan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Olemme investoineet reitioptimointiohjelmistoon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Olemme määrätietoisesti pyrkinneet tehostamaan autojemme täyttöasteita	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B6. Miten yrityksenne seuraa kuljetustyön määrää?

Jos kuljetustyön määrää seurataan muulla, kuljetuslaajanne kuvaavalla yksiköllä, valitse muu, ja kirjoita kommenttikenttään millä yksiköllä seurataan.

Seuraamme kuljetussuoritetta, eli tonnikilometrien (tkm) määrää

Emme seuraa kuljetustyömme määrää

Muu

Muu

B7. Mikä on arvionne tyhjänäajon osuudesta kokonaisliikennesuoritteestanne? (prosentteina %)

B8. Muuta lisättävää

Tähän saa vapaasti kommentoida jos on lisättävää aiheesta "Ympäristö ja energiatehokkuus"

Osa C: Ympäristöstrategia ja alihankkijat

C1.

1 Usein 2 Melko usein 3 Melko harvoin 4 Harvoin 5 Ei ollenkaan

Käytämme alihankkijoita

C2. Jos käytätte alihankkijoita, osaatko karkeasti arvioida prosenteissa kuinka paljon kapasiteettinne kasvaa heidän kuljetuskalustonsa myötä.

Esimerkki: Yrityksellä on neljä autoa, alihankkijalla kaksi. Kapasiteetti kasvaa 50 %.

C3.

1 Täysin samaa mieltä 2 Osittain samaa mieltä 3 En samaa enkä eri mieltä 4 Osittain eri mieltä 5 Täysin eri mieltä

Yrityksellämme on ympäristöstrategia

C4. Jos vastasit edelliseen kysymykseen "Täysin eri mieltä", eikä yrityksellänne ole ympäristöstrategiaa, jätä vastaamatta tähän kysymykseen.

1 Täysin samaa mieltä 2 Osittain samaa mieltä 3 En samaa enkä eri mieltä 4 Osittain eri mieltä 5 Täysin eri mieltä

Ympäristöstrategiamme näkyy päivittäisessä toiminnassamme

C5. Muuta lisättävää

Tähän saa vapaasti kommentoida jos on lisättävää aiheesta "Ympäristöstrategia ja alihankkijat"

Osa D: Toimenpiteitä päästöjen vähentämiseksi

D1.

	1 Täysin samaa mieltä	2 Osittain samaa mieltä	3 En samaa enkä eri mieltä	4 Osittain eri mieltä	5 Täysin eri mieltä
Tieliikenteen tavarankuljetuksista syntyviä ympäristöhaittoja ja -päästöjä tulee pyrkiä vähentämään tulevaisuudessa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ympäristötavoite tieliikenteen kasvihuonekaasupäästöjen nollaamisesta vuoteen 2045 mennessä on mielestäni tavoitettavissa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Uuden teknologian kehittäminen ja käyttöönotto on hyväksyttävä tapa vähentää päästöjä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Taloudelliset ohjaukset ovat hyväksyttävä tapa vähentää päästöjä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lainsäädännölliset kiellot ja rajoitukset (esim. tietyn päästörajan alittavan kaluston edellyttäminen) ovat hyväksyttävä tapa vähentää päästöjä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Valtion asettamat päästövähennystavoitteet ovat liian kunnianhimoisia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

D2. Muuta lisättävää

Tähän saa vapaasti kommentoida jos on lisättävää aiheesta "Toimenpiteitä päästöjen vähentämisestä"

Osa E: Vihreä kuljetus

E1.

	1 Täysin samaa mieltä	2 Osittain samaa mieltä	3 En samaa enkä eri mieltä	4 Osittain eri mieltä	5 Täysin eri mieltä
Yrityksemme seuraa aktiivisesti raskaiden ajoneuvojen sähköistymistä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yrityksemme tarpeisiin löytyy sopivia vaihtoehtoisia polttoaineita	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yrityksemme pyrkii olemaan vihreän kuljetuksen edelläkävijöitä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Siirtyminen fossiilisista polttoaineista vaihtoehtoisiin on suurimmaksi osaksi asennekysymys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Markkinoilla ei tällä hetkellä ole tarjolla kustannustehokkaita vaihtoehtoisia polttoaineita jotka vastaavat yrityksemme tarpeisiin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yrityksemme kuljettajilla on taloudellisen ajotavan koulutus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Täyttöasteen optimointi on hyvä tapa vähentää päästöjä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	1 Täysin samaa mieltä	2 Osittain samaa mieltä	3 En samaa enkä eri mieltä	4 Osittain eri mieltä	5 Täysin eri mieltä
Täyttöasteen parantaminen on hankala toteuttaa käytännössä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pyrimme lähivuosina lisäämään vaihtoehtoisten polttoaineiden käyttöä toiminnassamme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E2. Muuta lisättävää

Tähän saa vapaasti kommentoida jos on lisättävää aiheesta "Vihreä kuljetus"

Osa F: Taustatiedot

F1. Yrityksen nimi

F2. Yrityksen kotipaikkakunta

F3. Yrityksen vuotuinen liikevaihto

F4. Työntekijöiden määrä

F5. Vastaajan ammattinimike

F6. Yhteyshenkilö

Henkilö keneltä Bewi voi pyytää lisätietoa koskien kyselyn tuloksia. Yhteyshenkilön ei tarvitse olla sama kuin kyselyyn vastannut henkilö.

F7. Yhteyshenkilön puhelinnumero

F8. Yhteyshenkilön sähköpostiosoite

F9. Muuta lisättävää

Tähän saa vapaasti kommentoida kyselyä

Kiitos vastauksestanne!