

Nijmegen School of Management

Department of Economics and Business Economics

Master's Thesis Economics (MAN-MTHEC)

Incentivizing environmental sustainability investments

An investigation into the effectiveness of environmental reporting regulation and
monetary incentives to incentivize environmental sustainability investments

By Rens Nagtegaal (S1065424)

Nijmegen, 27 June 2023

Program: Master's Program in Economics

Specialisation: International Political Economy

Supervisor: Koos Wagenveld

ABSTRACT

Through a positivist qualitative approach, this thesis contributes to scientific, societal and policy debates concerning the effectiveness of two policies aiming to incentivize firms to invest in their environmental sustainability performance. The effect of both environmental reporting regulation and tax breaks and subsidies on the awareness of opportunities for environmental sustainability investments and willingness to engage in these investments is investigated.

The main research method employed is that of semi-structured interviews, based on literature and theory. Literature is inconclusive regarding both questions. A debate on environmental (reporting) regulation is highly active since Porter and Van der Linde (1995). The effectiveness of subsidies is debated by Bossle et al. (2016) and others. Seventeen firms and a sustainability advisory firm were interviewed, document analysis and web research were used to back up findings from these interviews. Reporting regulation is found to be effective at incentivizing investments particularly in small firms, tax breaks are found to be inefficient at incentivizing these investments, whereas subsidies and grants are found to be highly effective. Finally, environmental managerial concern is found to be of importance for willingness to invest and to accept higher costs. Furthermore, policy recommendations and avenues for further research are identified.

Keywords:

CSRD – environmental sustainability reporting – environmental tax breaks – environmental subsidies – sustainability – environmental sustainability investments – environmental managerial concern – Porter Hypothesis – ESG

PREFACE

Through this Master's Thesis, I hope to finalize my six years of study. The first three of these years I spent in Tilburg completing the BSc Economics, including an exchange semester at the Singapore Management University in the Fall of 2019. Shortly after returning home from my exchange semester the COVID-19 pandemic struck, which meant writing my Bachelor's Thesis at home. This was no easy process, both due to the pandemic and my inexperience in doing research in general. In the Spring of 2020, besides writing the Bachelor's Thesis, I made an important decision: I would enrol for the Master Economics: International Political Economy, an interdisciplinary Master's programme combining economics and political science. This meant adding a year of studying political science to my study career. Due to my belief that political science would fit me well, this was a sacrifice I was willing to make. Three years later I can conclude this was the right choice. I greatly enjoyed the year studying political science, even though COVID-19 meant that year was spent mostly at home. During that year I made one more important decision: applying for a board year at the ESV in Nijmegen. This, again, meant extending my study career by a year. Again, I can say this was a great decision. All these decisions and consequent experiences have led me to new places, to meet new people, and develop a great deal, both personally, professionally, and academically. At last, my study career will now hopefully come to an end with this Master's Thesis.

I would like to firstly thank my parents for their unconditional support, as well as my brother, for his support and advice, but also his function as an example of what is possible. Secondly, I thank my friends who have pulled me through hard times and celebrated the good ones with me. Without friends to celebrate, achievements have much less worth. Thirdly, I would like to thank the academic staff and university employees I have come to study and work with over the years in different settings. They have thoroughly shaped my time in university.

Regarding the past five months I would in particular like to thank my supervisor Koos Wagenveld and KPMG Meijburg&Co. Koos Wagenveld has helped channel my broad interest and broad set of ideas into a manageable project and given my valuable feedback whenever requested. Through KPMG Meijburg&Co. I have come into contact with several highly valuable contacts which greatly advanced this research. Finally, an exceptional thanks to my interviewees. I have learned a great deal from them and enjoyed the interviews greatly, and without them this Thesis would not have been possible.

All experiences described and people and organisations mentioned above have led me to this point in time, in June 2023, with (hopefully) my graduation in sight and on the brink of my professional career. I can truly say I am proud of what lies before you and I am happy with this being my final product of my six years of studying at university.

I hope you enjoy reading this thesis and possibly feel some of the bewilderment I have at times experienced during this research.

Rens Nagtegaal

Nijmegen, June 2023

Table of Contents

| | |
|--|-----------|
| TABLE OF CONTENTS..... | 5 |
| 1. INTRODUCTION | 7 |
| 1.1 MOTIVATION FOR THIS RESEARCH..... | 7 |
| 1.2 PROBLEM SETTING | 8 |
| 1.3 RESEARCH QUESTION AND SUB-QUESTIONS | 9 |
| 1.4 SCIENTIFIC CONTRIBUTION..... | 10 |
| 1.5 SOCIETAL CONTRIBUTION | 11 |
| 1.6 STRUCTURE OF THE STUDY..... | 12 |
| 2. LITERATURE REVIEW AND RESEARCH GAP..... | 12 |
| 2.1 TERMINOLOGY | 12 |
| 2.2 DRIVERS OF ENVIRONMENTAL SUSTAINABILITY INVESTMENTS | 13 |
| 2.3 ENVIRONMENTAL SUSTAINABILITY REPORTING REGULATION AND INVESTMENTS: THE PORTER HYPOTHESIS AND RELATED RESEARCH | 17 |
| 2.4 TOPOLOGY OF SUBSIDIES..... | 19 |
| 2.5 ENVIRONMENTAL SUSTAINABILITY INVESTMENT AND INNOVATION SUBSIDIES | 19 |
| 2.6 SUMMARY OF LITERATURE REVIEW..... | 21 |
| 2.7 LITERATURE GAP..... | 21 |
| 3. RESEARCH DESIGN..... | 22 |
| 3.1 SEMI-STRUCTURED INTERVIEWS | 24 |
| 3.2 DOCUMENTATION | 27 |
| 3.3 DATA COLLECTION..... | 28 |
| 3.4 DATA ANALYSIS | 30 |
| 3.4.1 Predetermined framework..... | 30 |
| 3.4.2 Coding, structuring & analysis of data..... | 34 |
| 3.5 PROPOSITIONS | 34 |
| 4. RESULTS..... | 35 |
| 4.1 PROPOSITION 1: ENGAGING IN ENVIRONMENTAL SUSTAINABILITY REPORTING INCREASES THE AWARENESS OF POSSIBILITIES FOR INVESTING IN ENVIRONMENTAL SUSTAINABILITY PERFORMANCE. | 35 |
| 4.1.1 Category 1: Environmental sustainability reporting requirements increase the ability to make choices based on data but has not spurred this specific investment decision. | 36 |
| 4.1.2 Category 2: Environmental sustainability reporting has not (yet) caused increased awareness for environmental sustainability investments..... | 36 |
| 4.1.3 Category 3: Environmental sustainability reporting requirements have led to increased awareness for environmental sustainability investment opportunities. | 37 |
| 4.1.4 Category 4: Internal environmental sustainability reporting has led to identification of environmental sustainability investment opportunities. | 38 |
| 4.1.5 Environmental sustainability reporting of clients leads to demands for more environmentally sustainable products and services and thus sustainable investments..... | 38 |
| 4.1.6 Expert insights..... | 39 |
| 4.1.7 Investment opportunities presented in documentation..... | 40 |
| 4.1.8 Concluding remarks on proposition 1..... | 40 |
| 4.2 PROPOSITION 2: AVAILABILITY OF SUBSIDIES INCREASES THE WILLINGNESS TO INVEST IN ENVIRONMENTAL SUSTAINABILITY PERFORMANCE. | 41 |
| 4.2.1 Expert insights..... | 42 |
| 4.2.2 Government Subsidies Afterwards (GSAs), tax breaks: core subsidies | 43 |
| 4.2.3 Government Subsidies Beforehand (GSBs), simple: middle subsidies..... | 44 |
| 4.2.4 Government Subsidies Beforehand (GSBs), complex: Champions League | 45 |
| 4.2.5 No subsidies used or considered | 46 |

| | |
|---|-----------|
| 4.2.6 <i>Other aspects</i> | 47 |
| 4.2.7 <i>Concluding remarks on proposition 2</i> | 48 |
| 4.3 PROPOSITION 3: ENVIRONMENTAL MANAGERIAL CONCERN IS ESSENTIAL FOR THE WILLINGNESS TO INVEST IN ENVIRONMENTAL SUSTAINABILITY PERFORMANCE AND THE DEGREE TO WHICH IT IS ALLOWED TO COME AT A SHORT-TERM FINANCIAL COST. | 48 |
| 4.3.1 <i>Intrinsic motivation for environmental sustainability investments</i> | 49 |
| 4.3.2 <i>Reputation as motivation for environmental sustainability investments</i> | 50 |
| 4.3.3 <i>Environmental sustainability investments are allowed to come at a cost</i> | 51 |
| 4.3.4 <i>Other insights</i> | 53 |
| 4.3.5 <i>Concluding remarks on proposition 3</i> | 54 |
| 4.4 PROPOSITION 4: ENGAGING IN ENVIRONMENTAL SUSTAINABILITY REPORTING MAKES FIRMS MORE PRONE TO APPLY FOR ENVIRONMENTAL SUSTAINABILITY INVESTMENT SUBSIDIES..... | 55 |
| 5. DISCUSSION & LIMITATIONS..... | 55 |
| 5.1 SUBJECTIVITY OF INTERVIEWEES | 56 |
| 5.2 QUALITY CRITERIA OF THIS STUDY..... | 56 |
| 5.3 GENERALIZABILITY OF FINDINGS: SELECTION BIAS | 57 |
| 5.4 ROBUSTNESS OF FINDINGS: NUMBER OF INTERVIEWS..... | 57 |
| 5.5 GENERALIZABILITY OF FINDINGS: VARIETY IN SECTORS AND TYPES OF FIRMS..... | 58 |
| 5.6 EFFECTIVENESS OF GSAS: MAY DEPEND ON SIZE OF THE TAX BREAK GIVEN | 60 |
| 5.7 OTHER FACTORS AT PLAY | 61 |
| 5.8 OTHER FINDINGS | 65 |
| 6. CONCLUSION, POLICY RECOMMENDATIONS AND AVENUES FOR FURTHER RESEARCH. 66 | |
| BIBLIOGRAPHY | 69 |
| APPENDIX 1: INTERVIEW GUIDE..... | 82 |
| APPENDIX 2: OVERVIEW OF FIRMS CONTACTED AND INTERVIEWS CONDUCTED PER INDUSTRY..... | 84 |
| APPENDIX 3: OVERVIEW OF CONDUCTED INTERVIEWS..... | 85 |

1. Introduction

1.1 Motivation for this research

Sustainability is a theme most companies are starting to engage with more and more, either voluntarily or due to rules and regulation given out by (supra)national regulatory bodies and governments. An important strand of regulation is the Non-Financial Reporting Directive (NFRD, Directive 2014/95/EU, 2014) and Corporate Sustainability Reporting Directive (CSRD, Directive 2022/2464/EU, 2022) which were implemented in 2014 and 2022 respectively, concerning non-financial reporting for firms operating in the EU. Where NFRD covered around 11,000 firms, CSRD will cover around 50,000 European firms (European Commission, 2023), making it much more prevalent and a more relevant object of study in terms of the effects it will have on business operations. These two directives aim to make the sustainability performance of medium and large size firms more transparent. On one hand it makes their sustainability performance more transparent for outside investors, NGOs, and other societal actors, but it also makes sustainability performance more insightful for the firm itself. By making the sustainability performance more transparent, the regulation aims to make firms aware of the risks associated with poor sustainability performance, at the same time it can make managers aware of new business opportunities in this regard.

Next to more widespread regulatory requirements on sustainability reporting, the EU has also presented a large set of subsidy programs as part of its European Green Deal (European Commission, 2020). These subsidies require quite some work on the part of firms to apply for. They must be aware of their availability, must investigate whether their project or investment fits the criteria of the subsidy program and then actually apply and be granted the subsidy. Even though many firms seem eager to make their operations more environmentally sustainable, the difficulties in finding out how to apply for, and then actually applying for, these subsidies, may lower their attractiveness. Especially given the tight labour market conditions, for instance in the sector of business services (EURES, 2022), firms may not have the capacity to inform themselves constantly of the possibilities with respect to investment subsidies or the capacity to engage in these applications. If this is indeed the case, this could mean current government policies aiming to spur innovation and innovation adoption are not being exploited to their fullest and do not reach their planned aims. This would ask for a critical review of the investment subsidy policies in the

Netherlands and the EU. This thesis thus aims to contribute to answering the following two questions:

1. Does environmental sustainability reporting, such as that implied by CSRD, incentivise or push firms towards environmentally sustainable investments?
2. Are subsidies, grants, and tax credits effective at incentivising firms to engage in environmental sustainability investments?

1.2 Problem setting

Sustainability is a hot topic in most businesses. Each person and firm must contribute to reducing environmental pressure of our economic output to keep global warming and climate change to a minimum. Firms therefore need to address their environmental sustainability performance. They must reduce environmental pressure exerted by their operations, and to do this they often have to invest. Investing in reduction of environmental pressure exerted, or investing in environmental sustainability performance for short, can be done for a multitude of reasons. First, an investment decision is made based on the indicators of profitability and risk (Markowitz, 1952; Merton, 1969; Samuelson, 1969; Li and Ng; 2000). But what makes an investment profitable and what to include in this analysis depends on a multitude of factors. It depends on what are included as costs and benefits of the investment, such as the effects of the investment on reputation and goodwill, the duration over which the investment is written off or the risk analysis associated with the investment. Second, for an investment to be made to begin with, the firm must be aware of the possibility to improve a certain process or achieve a reduction in a current cost it bears through investment. Some analysis by the firm must be done into how and why the investment can and should be made. Both of these factors are influenced by current sustainability efforts in the EU and the Netherlands, namely sustainability reporting standards enforced through the NFRD and the coming CSRD-regulation, and investment subsidies and grants given out through one of the many funds made available by the EU and in the Netherlands for investing in environmental sustainability performance.

So how do firms make investment decisions with respect to environmental sustainability performance? And what role do sustainability assurance and available environmental sustainability investment subsidies play in this? Does their sustainability reporting make them more intent on investing in environmental sustainability? And do subsidies play a decisive role in engaging in the

investment, or are the subsidies simply a pleasant bonus to increase the profitability of an otherwise profitable investment? And does this depend on the other options available to the firm?

These questions and others are what this thesis will attempt to answer through an inquiry at a set of European firms engaged in environmental sustainability performance investments either currently or a short time ago.

This research will specifically investigate environmental sustainability investments. The NFRD and CSRD regulation looks at a broader spectrum of sustainability indicators, including social and governance indicators. Regarding subsidies, however, most subsidies in this regard aim at investments that improve environmental sustainability performance. With the aim of reducing environmental pressure of businesses and stopping and ideally reversing climate change in mind, it seems most sensible to look specifically at the environmental sustainability part of the regulation and subsidies aimed at improving that specific type of sustainability. This also lies most in line with the interests of the researcher.

Furthermore, this research will focus on investments by firms in their own operations, not investments by outside investors in terms of equity purchases.

1.3 Research question and sub-questions

The research question for this thesis is the following:

How do environmental sustainability reporting regulation and environmental sustainability investment subsidies in the EU and the Netherlands influence firms' environmental sustainability investment decisions?

From this question, multiple sub-questions arise. First, does engaging in non-financial reporting, which is becoming mandatory in phases for all firms in the EU, push firms towards investing in their environmental sustainability performance? Seeing as this is one of the goals of this regulation it is interesting to investigate whether this indeed is the case.

Second, does the harmonisation of this type of reporting affect the pressure felt from it by firms to engage in environmental sustainability-related investments. Harmonisation of reporting structure should make comparing firms easier for outsiders, both investors and societal actors such as NGOs and consumers. It is therefore interesting to investigate whether firms experience more

pressure to engage in environmental sustainability investments due to the increased possibility for scrutiny.

Third, how do firms take into account available subsidies in their environmental sustainability investment decisions? A large number of subsidies at both the national as well as European level is available for investment in environmental sustainability, but that may not necessarily mean firms are more prone to investing in improving their environmental sustainability performance because of these available subsidies. It begs the question if and how they consider these subsidies.

Fourth, does engaging in non-financial reporting affect the process of acquiring subsidies for environmental sustainability investments? Ideally, from the perspective of the European Commission and Parliament, the different policies on the European and national levels that are aimed at incentivising these investments reinforce each other. Whether that is the case is one of the questions this research should be able to answer, at least preliminarily.

1.4 Scientific contribution

The aim of this research is to contribute to existing literature on the adoption of environmental sustainability innovations (Bossle et al., 2016, among others), environmental sustainability investment decisions (Hoffmann, 2007, among others), the effects of environmental sustainability reporting standards on firms' behaviour with respect to improving their environmental sustainability performance (Steinmeier and Stich, 2019) and on the reasons for using or not using subsidies when engaging in these investments. Previous research provides insight into the correlation between subsidies and environmental sustainability innovation adoption in a set of different contexts (Weng and Lin, 2011; Jaffe et al, 2005; Bossle et al, 2016; Horbach, 2008). To the knowledge of the author, however, no thorough qualitative research has been done into the reasons for applying for and using environmental sustainability subsidies. Through a thorough analysis of qualitatively acquired data this research should provide a picture of the important factors in making these decisions. Specifically, the aim of this research is to gain insight in the complementarities of non-financial reporting regulation and environmental sustainability investment subsidies as well as the effectiveness of environmental sustainability investment subsidies, specifically for the Dutch market that is. The method of this research allows a picture to be drawn up of the perception of these policies from the side of firms.

1.5 Societal contribution

This research aims to give policymakers insight into the usefulness of a set of policies with respect to the aims of the policies. Specifically, by analysing the decision-making processes of (Dutch) firms' environmental sustainability investment decisions and the role of non-financial reporting standards as well as environmental sustainability investment subsidies in this process. First, the policy of standardising non-financial reporting standards and obliging firms to engage in this type of reporting aims to make firms more aware of environmental sustainability-related business opportunities (CSRD, Directive 2022/2464/EU, 2022). This research hopes to provide insight into whether firms indeed experience this in their day-to-day or year-to-year operations. By reporting on environmental sustainability-related matters the firms themselves, as well as investors, consumers, and NGOs, are presented with insights into the environmental sustainability performance of the firm. The question is whether this transparency and clarity actually pushes firms towards engaging in more environmental sustainability investment opportunities, one of the goals presented in the CSRD-regulation (CSRD, Directive 2022/2464/EU, 2022). Even though no firms are obliged to report according to CSRD standards yet, many firms already engage in non-financial reporting, either according to NFRD standards, other (inter)national standards or their own methods. Therefore, this research will consider all forms of environmental sustainability reporting used by firms.

Next, this research analyses firms' perceptions of the necessity of subsidies for the viability of their environmental sustainability investments. A possible outcome is that some of the subsidies are not critical for the business case for an investment, which means it may not be an optimal use of public funds. In this case further research can be done into what types of subsidies are used by firms but not critical to their business case, e.g., the investments would have been made either way.

Ideally, engaging in non-financial reporting leads to the identification of environmental sustainability investment opportunities, which should be engaged in quicker if subsidies are available for the particular investments. This research aims to identify on the one hand whether the two types of policy indeed strengthen each other in this way. On the other hand, it aims to identify whether the subsidies are taken up in an efficient way for society, in the sense that the investments would otherwise not have been made.

1.6 Structure of the study

The remainder of this thesis is structured as follows. Chapter two will present a literature review in which the relevant lines of research will be thoroughly investigated, and a research gap is identified. Next, in chapter three, the research design and methodology are laid out. This includes a theoretical framework on which a set of propositions can be based concerning the mechanisms at play when making environmental sustainability investment decisions. Furthermore, the processes of data collection and data analysis will be described. Chapter four presents and analyses the results of the research. Following the presentation and analysis of the results, the results will be discussed in terms of their generalisability and robustness in chapter five, including a discussion of quality criteria, limitations of this research and other relevant topics and insights which arose during analysis. Finally, the thesis will conclude in chapter six by recapitulating results, proposing several policy recommendations, and laying out avenues for further research.

2. Literature review and research gap

Three lines of literature research were engaged in as preparation for this research. The first line of research concerns the actual making of investment decisions and the drivers for investing in environmental sustainability for firms. The second line of research is research into sustainability- and non-financial-reporting, its aims, and its possible effects with respect to environmental sustainability investments. The third line of research concerns investment subsidies, specifically environmental sustainability investment subsidies and their purported impacts. This section will first shortly discuss terminology, then discuss the three different strands of research, including a short topology of investment subsidies under discussion.

2.1 Terminology

First, we must shortly note the terminology this research uses. Franceschini et al. (2016) have done an extensive review of the most used terms to describe the phenomenon of innovation and investment in ‘sustainability’. The four relevant terms here are environmental innovation, eco-innovation, green innovation, and sustainable innovation. The difference in use between eco-innovation and environmental innovation mainly leans on a difference in users. Eco-innovation is mostly used by scholars working with eco-design, whereas environmental innovation is used when

discussing regulatory and policy effects. Sustainable innovation alludes to a broader aim, namely also socially responsible innovations. Green innovation is more related to management and competition issues. Among these four environmental and eco-innovations are similar, and sustainable and green innovation are similar. Eco-innovation and environmental innovation overlap as both refer to innovations that reduce the environmental impact of a firm. For this research environmental innovation is the most befitting term. Therefore, as firms use the term ‘sustainable’ or ‘sustainability’ when alluding to these topics, this research will use the term ‘environmental sustainability investment’ or a closely related version of this term.

2.2 Drivers of environmental sustainability investments

The first line of research relevant here concerns the purported drivers of what in research is often called ‘adoption of eco-innovation’ and the factors influencing decision-making over whether to invest in environmental sustainability performance.

The research into the drivers of environmental sustainability investment can be placed in the tradition of institutional theory. Institutional theory was developed in the 1990s by Powell and DiMaggio (1991), Scott et al. (1995) and Jennings & Zandbergen (1995) and is based on earlier related research on organisations and how and why they conform to certain rules and informal institutions. Powell and DiMaggio (1991) first use the term as such in the context of rejecting rational-actor models and seeking more cultural and cognitive explanations for organisational behaviour. Scott et al. (1995) add to this that firms must conform to the existent informal institutions to gain legitimacy and stay relevant, this is called isomorphism in the literature (Dacin, 1997; Deephouse, 1996; DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Suchman, 1995). The theory that develops states that firms perceive both institutional and competitive pressure from their peers, as well as from regulators and other outside actors and adjust their behaviour accordingly, in a process called isomorphism (Deephouse, 1996). Jennings & Zandbergen (1995) split institutional pressure into two kinds of pressure, this is later split into three types. The types Jennings & Zandbergen distinguish are: (1) coercive pressure and (2) mimetic pressure. Later this will be split into three types of pressure as coercive pressure is split into two types of pressure again, as described by De Jonge (2015), for instance by Bossle et al. (2016), resulting in the following three types of external pressures active in shaping firm behaviour:

1. Direct coercive pressure (later known as coercive pressure);

2. Indirect coercive pressure (later known as normative pressure);
3. Mimetic pressure.

All these pressures are forms of legitimacy-seeking behaviour. Either the firm seeks legitimacy from the government, by obeying the laws and regulations in place, it seeks legitimacy from the public, NGOs, and other civil society actors by obeying to certain standards or norms which are not enforced directly, or it seeks legitimacy for its actions by engaging in similar behaviour to competitors. This gives the firm legitimacy both from these competitors and from consumers who recognise the firm as acting in a sensible way compared to its competitors.

These three types of pressures on firms will be used as a framework for the external drivers of environmental sustainability investments in this section. Next to external drivers there are also internal drivers such as managerial concern, concern for reputation (linked to normative pressure), technological capabilities and cost-efficiency. This will be discussed below.

Bossle et al. (2016) have done an extensive review of the literature on the drivers of environmental sustainability investments and provides a broad set of drivers. First, they provide a set of external factors, including all three types of pressure: regulatory coercive pressure from governments; normative pressure from environmentalists, clients and suppliers, mimetic pressure from cooperation with suppliers, universities, R&D facilities, and technological centres; the prospect of expanding market share; the characteristics of the technology environment at the industry level; governments and the extent to which they work to increase market environmental awareness. Next, they provide a set of internal factors that drive environmental sustainability investments: efficiency improvements due to cost savings associated with environmental performance improvements; environmental managerial concerns; environmental leadership in the organisation; environmental culture in the organisation; environmental capability in the organisation; performance measures such as sales growth, market share and return on investment. Finally, they provide a set of control variables, namely firm size, public financing, and the sector. These three can moderate environmental sustainability investment decisions.

Yang et al. (2018) and Wang et al. (2018) study the effect of industry norms as forms of normative pressure on corporate sustainable behaviour. Both conclude industry norms are relevant in this regard. Yang et al. (2018) state industry peers' behaviour provide a form of normative pressure among listed firms in China. Wang et al. (2018) state industrial associations can be an important source of normative pressure. Industry norms are influenced by the themes salient in

these industrial associations, which are made salient in conferences, sector magazines and other intra-industry forms of communication.

Chen et al. (2018) study whether institutional pressure fosters corporate green innovation and make the same distinction between types of institutional external pressure as De Jonge (2015) provides. They conclude that coercive and normative pressure have significant positive effects on corporate green innovation. Triguero et al. (2013) find drivers for environmental sustainability innovations on the supply side, the demand side, and the policy side. The supply side factors are internal drivers. The demand factors are external drivers, such as market demand for green products (normative pressure). They also identify policy influences, specifically existing regulation, which is coercive pressure in the institutional theory framework, and expected regulation. Diaz-Garcia et al. (2014) identify drivers of environmental sustainability innovations through a literature review in three levels. Relevant drivers at the macro-level include regulation (coercive pressure), expected regulation and closeness to research centres and universities. At the meso-level they include financial viability, which is an internal driver, market demand (normative pressure), pressure groups (normative pressure) and industry characteristics (mimetic pressure). At the micro-level they include cost-savings, for instance through reduction of energy and material use, green organisational identity, quality management systems and technological capabilities. Frondel et al. (2007) identify drivers for end-of-pipe environmental sustainability innovations which are innovations reducing emissions at the end of the production cycle. They recognize stringent environmental policy (coercive pressure) and regulatory measures based on this as most influential. For process innovations cost-savings, general management and environmental management systems are found to be the most influential drivers of environmental sustainability innovations. Bitat (2017) aims to refine the Porter Hypothesis and models the drivers for environmental sustainability innovation and finds market incentives are most effective, as opposed to legally binding instruments, also known as command-and-control instruments.

Saunila et al. (2018) also identify drivers of environmental sustainability investments, both in the exploration and exploitation of the opportunities associated with it. They find that the more a firm values economic, institutional, and social sustainability, the more likely it is to invest in green innovation. Green innovation here means innovation in ideas, goods or services that deal with environmental problems. This corresponds to the definition of environmental sustainability innovation adopted in this research. Another finding in their research is that environmental

sustainability is not found to affect the willingness to invest in or exploit green innovation, it is not a driver of it. This runs contrary to expectations as green innovations specifically aim to improve environmental sustainability performance of the firm. The possible reason for this given in the study is that their study looks at a low-profitability sector, where the main concerns are economic by nature. Given that these investments are profitable, the driver does not have to be environmental sustainability cares but can simply be economic.

Horbach (2008) does another attempt to identify the determinants of environmental sustainability innovation based on the German market. The main drivers he finds are technological capabilities and market characteristics on the supply side, expected market demand and the social awareness and preference for environmentally friendly products on the demand side (normative pressure), and environmental policy and present institutional structures on the institutional and political side (coercive pressure). Qi et al. (2010) identify drivers of environmental sustainability innovation in the construction industry. The main identified drivers are managerial concern, government regulations (coercive pressure) and business size. Contrary to other research, perceived stakeholder pressure (normative pressure) is not found to be a significant driver of environmental sustainability innovation. Cai and Li (2018) claim the main drivers of environmental sustainability innovation in China are the following: competitive mimetic pressure, market-based instruments, technological capabilities, customer green demand (normative pressure) and environmental organisation capabilities. Agan et al. (2013) conclude from their study of Turkish SMEs that expected benefits stemming from improved reputation (normative pressure) are the strongest driver of environmental activities, including investments, of these firms. Bansal & Roth (2017) study the motivations for firms to invest in sustainable practices and find three main motivations: competitiveness (mimetic pressure), legitimation (normative pressure) and ecological responsibility (normative pressure). Finally, a study into the determinants of environmental sustainability innovation in US manufacturing industries by Brunnermeier & Cohen (2003) concludes increased monitoring and enforcement (normative pressure) by environmental regulators do not provide additional incentive to innovate. An important note is that this runs contrary to the Weak version of the Porter Hypothesis.

2.3 Environmental sustainability reporting regulation and investments: The Porter Hypothesis and related research

When it concerns environmental regulation including reporting and its effects on businesses and their environmental (innovation) investments, there is a critical paper from where we should start, namely Porter and van der Linde (1995). First, they claim that strict environmental regulation can incentivise firms to innovate in terms of their sustainability performance. This is what will later be called the Weak Porter Hypothesis. They answer criticisms on an earlier version of this claim made in a previous version of this paper (Porter, 1991) by tackling the main arguments brought forth by their critics (Jaffe et al., 1995a; Jaffe et al, 1995b; Oates, Palmer and Portney, 1993; Palmer and Simpson, 1993; Simpson and Bradford, 1996 (working paper is from 1993); Schmalensee, 1993). Apart from their first claim, they say firms can also experience improved business performance because of their innovations. This second claim is called the Strong Porter Hypothesis. Porter and Van der Linde have provided examples in their original paper of both of these hypotheses working out. In the literature, however, evidence has mainly been found for the Weak PH (Rubashkina et al., 2015; Chen et al., 2018; Cai and Li, 2018; Horbach, 2008; Van Leeuwen and Mohnen, 2017; Lanoie et al., 2011; De Vries & Withagen, 2005), but not so much for the Strong PH. Most research finds mixed evidence at best for the Strong PH (Rubashkina et al., 2015; Rexhäuser and Rammer, 2014; Lanoie et al., 2011; Van Leeuwen and Mohnen, 2017). An exception to this is research by Horbach et al. (2013) who show environmental sustainability innovations can combine competitiveness objectives and environmental objectives among firms in French and German industry, thereby supporting the Strong PH. This suggests at least that environmental regulation, of which reporting regulation is a part, can prone firms to invest and innovate in their sustainability performance.

The underlying mechanism of relevance here is that managers are made aware of the possibilities for improving their (environmental sustainability) performance by increased (environmental) sustainability reporting requirements. This is underpinned by Rennings et al. (2006), who state that implementing environmental sustainability reporting mechanisms positively influence environmental innovations, implying influence on investments therein. Rehfeld et al. (2007) claim the same concerning environmental product innovations, again implying an influence on investments therein.

Further research on environmental reporting regulation and its effects on business performance and managerial decision making often points to a positive relationship between the two. Steinmeier and Stich (2019) conclude sustainability assurance improves managerial investment decisions in the field of corporate sustainability particularly due to a reduction in under-investment in sustainability. Caputo et al. (2021) conclude increased Corporate Social Responsibility (CSR) information disclosure is a signal of orientation towards sustainable practices, acting as an attractor to socially responsible investment (SRI) investors and favouring sustainability investments. We should note that this signalling effect may become less salient due to the obligatory nature of sustainability reporting regulation. The signalling may still take place regarding the quality or amount of information disclosed. Zhou et al. (2019) find evidence among Chinese firms that a focus on CSR combined with public pressure, which can come from the transparency forced by sustainability reporting regulation, is correlated with technological innovation investment. Kesiduo & Demirel (2012) look at empirical evidence from the UK and find that demand factors such as customer wishes can affect the decisions of firms to undertake eco-innovations, innovations aimed at improving environmental sustainability, but have little to no impact on the level of these investments. The level of these investments is stimulated by factors such as cost savings, organisational capabilities, and the strictness of regulation. An interesting finding is that stringent environmental regulation mainly affects the least and the most innovative firms. This happens through the capitalisation of opportunities to increase efficiency and reduce production costs for the least innovative firms and the identification of possible benefits stemming from the first mover advantage for the most innovative firms.

Cubas-Díaz and Sedano (2017) review the Triple Bottom Line Approach introduced first by Elkington (1997). The Triple Bottom Line Approach is one where firms do not only look at the risk and profit associated with investments and their operations in general, but also with the (environmental) sustainability aspect of their operations. Taking the sustainability impact of investments into account can make the analysis of its effects much more accurate, is what Elkington claims. More accurate impact assessments of potential investments are highly relevant for firms and investors, logically. For this to be possible, however, the information must be available to the managers in the firm making the investment decisions. Sustainability reporting regulation can logically provide in this. Combine this with the thesis of Porter and Van der Linde (1995) concerning the awareness created for the opportunities for improvement of environmental

sustainability performance by the introduction of sustainability reporting and we see again that sustainability reporting regulation should be able to lead to increased investments in environmental sustainability performance by firms.

Finally, it is important to note that the CSRD and NFRD aim to incentivise firms to invest in their sustainability performance through, among other things, increased stakeholder pressure. The CSRD (CSRD, Directive 2022/2464/EU, 2022) includes in its preamble multiple relevant notions. First, the improved non-financial reporting provides investors with better understanding of the risks and opportunities sustainability poses to a firm. Second, civil society actors wishing to hold a firm accountable for its impact on society and the planet are better able to check what a firm is doing in this regard. The regulation also includes sector-specific standards, making intra-sector comparisons easier, thereby increasing the possibility to compare a firm to its competitors in terms of sustainability performance and request it to perform better in this regard.

2.4 Topology of subsidies

Before laying out the literature review on environmental sustainability investment and innovation subsidies, first, a topology of subsidies should be provided. An important distinction in type of subsidies is made by Peng & Liu (2018). They divide government subsidies into Government Subsidies Beforehand (GSB) and Government Subsidies Afterwards (GSA), where GSB are subsidies with a specific goal for developing a specific innovation and GSA are reimbursements of costs incurred for engaging in certain investments related to R&D through a tax break or credit. A tax break allows a firm to subtract a certain cost, in this case a percentage of the gross investment cost, from earnings, to lower the earnings before tax. Czarnitzki et al. (2011) investigate tax credits, which are a form of GSA, as investment subsidies.

2.5 Environmental sustainability investment and innovation subsidies

The third line of research concerns subsidies for environmental sustainability investments and the role they play in the decision-making processes concerning these investments. Chen et al. (2018) have done extensive research for the 100 largest firms in China on whether institutional pressure fosters corporate green innovation, a part of which is investment in environmental sustainability performance. As noted above, they corroborate the weak PH in claiming that

coercive and normative pressure can have significant positive effects on corporate green innovation. They divide institutional pressure into three types of pressure, specifically coercive pressure that originates from regulations by governmental agencies, normative pressure from customers and NGOs and mimetic pressure originating from competitors. They conclude coercive and normative pressure can drive firms towards green innovation, and importantly for this research, they also conclude market-oriented environmental regulation approaches including subsidies should be employed by governments to foster green innovation as they deem it effective. The relevant conclusions from this research for this thesis is that coercive and normative pressure can drive firms towards green innovation, which implies it drives them towards environmental sustainability investments. It also states subsidies are an effective method to do this. Furthermore, Mateut (2018) finds a positive correlation between available subsidies and innovative activities, such as environmental sustainability innovations, in emerging economies and Cucchiella et al. (2021) find that more and various available forms of subsidies seem to be correlated to growth in renewable energy uptake and production in Western Europe. Bossle et al. (2016) find that public financing, of which investment subsidies are a part, are a significant driver of adopting eco-innovations, which requires investments in environmental sustainability. De Machi (2012) does not make any absolute claims regarding the effects of subsidies but does say public grants foster sustainability-improving innovations to a higher extent than other types of innovations. Weng and Lin (2011) do find that governmental supports, among which are subsidies, are among the significant drivers of green innovation adoption for Chinese SMEs. Again, adoption of green innovation implies investing in environmental sustainability. Song et al. (2022) investigate the effects of government subsidies on the sustainable innovation of university-industry collaboration and concluded that increasing subsidy levels lead to increased efforts by both universities as well as firms into (environmental) sustainable innovation. Cuerva et al. (2014) find no significant relationship between public support and green innovation among low-tech SMEs in the Spanish food and beverage industry. Horbach (2008) finds subsidies are correlated with environmental product innovations. In that same line of research Horbach et al. (2013) find subsidies are not an important driver of eco-innovation and thereby for investments in environmental sustainability performance among French and German industrial firms. Similar results were found by Jove-Llopis & Segarra-Blasco (2018) for Spanish manufacturing firms. Although they find public regulations can encourage firms to place eco-innovation among their strategic priorities, they find

subsidies are not found to be a significant driver of these activities. Triguero et al. (2013) look at European SMEs and their drivers for eco-innovations and find access to subsidies and fiscal incentives do not have significant effects on the decision to engage in such innovations. Concerning tax credits, which are a type of subsidy, Czarnitzki et al. (2011) find R&D tax credits can promote innovation and lead to additional innovation output among Canadian firms, implying more investments too. Similar findings are done by Brouillat and Oltra (2012), who show tax-subsidy systems can lead to innovation in products, implying corresponding investments.

2.6 Summary of literature review

From the three strands of research presented above we can draw some conclusions. First, increased sustainability reporting seems to incentivise firms to invest in their environmental sustainability performance. Second, subsidies and other government grants seem to be positively correlated with the investment in and exploitation of environmental sustainability innovations, but possibly not in all sectors and in every place. Third, different researchers find different drivers for investing in environmental sustainability performance or for adoption of environmental sustainability innovations. Evidence for the different types of external drivers related to institutional theory is mixed. Coercive regulatory pressure as well as normative pressure is mostly found to drive these types of investments. Multiple studies also identify managerial environmental concern, an internal driver, and perceived ecological responsibility (normative pressure) as a driver for these investments. Mimetic pressure is found in some studies to be a driver of environmental sustainability investments, but not in others.

2.7 Literature gap

Based on the literature review above multiple gaps in the literature can be identified, as well as notions on which the literature is inconclusive, to which this research aims to contribute. First, concerning subsidies, research has been done into the uptake of subsidies and its correlation to innovation or innovation adoption, but fairly little research thus far has been done into the role subsidies play practically in the making of investment decisions. Therefore, more qualitative research on this topic will contribute to this. Especially little research has been done into whether environmental sustainability reporting moves firms towards applying for environmental

sustainability subsidies or whether improved environmental sustainability reporting makes this process easier, in the perception of the people in the firm at least. Multiple empirical studies have been done into the lines of research concerning both environmental sustainability reporting and environmental sustainability investment subsidies in for instance the Chinese market, or the UK market. Apart from Van Leeuwen and Mohnen (2017), which specifically studies the Porter Hypothesis, no research to the knowledge of the author has been done into the Dutch market. Chen et al. (2018, p. 304) state: “the reasons as to why some firms invest in more green innovation than others and under what conditions they pursue such innovation are under-explored, and how to effectively motivate green innovation among firms still needs more exploration”. This research aims to contribute especially to the first half of this statement. Some notions on which the literature is inconclusive are the role of normative stakeholder pressure and competitive mimetic pressure in motivating environmental sustainability investments. Qi et al. (2010) claim stakeholder pressure is no significant driver, whereas Chen et al. (2018) claim it is. This difference could stem from the different timings of these studies; however, this cannot be said for sure. Cai and Li (2018) claim competitive pressure is a significant driver, whereas Chen et al. (2018) claim it is not. Here the difference clearly cannot stem from the timing of the studies. Mostly, this research aims to understand the perception of the decision makers concerning environmental sustainability investments in firms and whether they feel subsidies and environmental sustainability reporting contribute to their willingness to invest in the environmental sustainability performance of the firm. It must finally be said that some of the research used in this literature review is more than 10 years old and may therefore have become irrelevant in the meantime, especially considering the rapid developments in societal importance attributed to environmental sustainability. To recalibrate the research in this respect is therefore also an aim of this study.

3. Research design

The main goal of this research is to uncover the decision-making factors at play when the relevant people engage in environmental sustainability decisions, specifically the role that environmental sustainability reporting and subsidies play in this. Given the goal is to understand a complex process and all possible drivers at play and the ‘how-character’ of the research question, a qualitative research method is most suitable (Mandal, 2018). Specifically, case study research

lends itself well to research questions that aim to uncover the ‘how’ or the ‘why’ behind certain actions or processes (Yin, 2018). This allows the complexities of a decision-making process to be uncovered in a better way compared to using a quantitative research method. A caveat is the subjectivity of this type of research given the researcher’s direct part in data collection (Dixon-Woods et al., 2004). To prevent the issue of subjectivity pre-emptively this research will specifically engage in positivist case studies. Shanks (2002) describe the necessities for a positivist case study and for the underlying positivist paradigm. The positivist paradigm requires three assumptions on the nature of reality and the research: 1) there is an objective reality which can be studied through empirical investigation (the ontological position), 2) the researcher and the investigated phenomena are assumed to be independent (the epistemological position), 3) general theories are used to create propositions which can be operationalised into hypotheses, these can be tested and this testing is replicable and therefore the conclusions are falsifiable (the methodological position). The assumption for ontology holds in this study, as the assumption is indeed made that the investment decision making process can be objectively studied, including the factors at play in it. The epistemological assumption holds too, the researcher’s aim is merely to be informed on the relevant factors in the investment decision making process, he is not in any way connected to this process. Finally, the methodological assumption holds too, propositions for this study are based on theory and can be confirmed or falsified through extensive research of this type. Thus, the positivist position is the basis for the case studies engaged in throughout this research.

Denzin & Lincoln (1994) describe what makes research qualitative, namely it “attempts to make sense of, or to interpret, phenomena interns of the meanings people bring to them.” (Denzin & Lincoln, 1994: 3). This fits with the aim of this research.

Mortelmans (2018) describes the five characteristics of qualitative research. The questions posed should concern complex themes or social processes and the goal should be to uncover the processes at play in the daily reality. The research design is flexible and aimed at holistically understanding the context (1). Data collection is flexible in its methods and often consists of multiple methods in one study (2). It often implies long-term or intense contact with the field. Analysis occurs most often based on text instead of numbers (3). The aim of analysis is to uncover the processes at play and to understand these processes comprehensively and thoroughly and not only to describe them at surface level (4). Finally, the presentation of results aims to show the full context and considers the effect of the researcher on the research itself (5).

Two methods of data collection will be used: semi-structured problem-centred interviews and documentation analysis. Possible issues regarding the methodology adopted in this research are covered in chapter five.

3.1 Semi-structured interviews

The main research method used in this study is the positivist semi-structured interview. Positivist here means that the researcher aims to acquire information as objectively as possible through subjective means (Shanks, 2002). Positivist case research of this type requires clear methodological guidelines to ensure construct validity, internal validity, reliability, and external validity (Shanks, 2002; Yin, 2018). Construct validity concerns the trustworthiness of the empirical data and can be improved upon by executing ‘member checks’, by using multiple data sources per phenomenon and establishing a clear chain of evidence (Yin, 2018). Member checks are summaries of the interview sent to the interviewee to ensure the correctness of the transcript. Internal validity concerns the degree to which the relationship identified is indeed causal and not impacted more by other variables, this is achieved through ‘pattern matching’, part of the data analysis process (Yin, 2018). Reliability concerns stability and consistency of the study itself over time and is ensured by adhering to the same study protocol, in this case the interview guide (Yin, 2018). External validity concerns generalisability of the findings and is ensured by selecting typical cases or making more specific claims concerning the degree of generalisability (Shanks, 2002).

Semi-structured interviews are dialogues with relevant people for the process the researcher is attempting to understand in which the researcher has a set of prepared questions which they pose to the interviewee, but with the possibility of going into topics deeper that are touched upon and seem relevant to the researcher (Bleijenbergh, 2015; Qu and Dumay, 2011). Hopf (2004) states semi-structured qualitative interviews are useful when attempting to enquire openly about situations and motivations for actions. These interviews are problem-centred, meaning they aim to gather objective evidence on human behaviour as well as on subjective perceptions and ways of processing social reality (Witzel, 2000). Previous knowledge serves as a heuristic-analytical framework during data collection, but no particular theory is tested.

Guest et al. (2006) and Malterud et al. (2015) describe what factors are relevant in determining the number of interviewees necessary. Guest et al. (2006) bases this on the notion of ‘saturation’,

referring to a situation in which no new themes arise in data collection. Malterud et al. (2015) identify five determinants for the number of respondents necessary, namely study aim, combination of participants, use of theory, quality of dialogue and the number of cases studied. In this case the study aim is fairly broad, covering multiple sectors and firm sizes. The combination of participants alludes to whether the participants belong to the target group, which should be the case for all interviewees. The use of theory is strong in this case. The quality of dialogue is something that should improve over time with doing more interviews. Finally, this research studies different cases each time. This means two factors point to less interviewees necessary and two factors point to more interviewees necessary and one is ambiguous.

The interviewees are people that have relevant knowledge of the investment decision-making process or are one of the decision-makers themselves. They can also be experts from outside firms who can tell more about their experiences in advising firms on investment trajectories.

The framework used for both the interview guides as well as the analysis afterwards is based on literature and will be discussed in section 3.4.1. Similar research methods have been used in similar research cases, such as by Hoffmann (2007), who studies the effect of the EU ETS on investment decisions in the German electricity industry and uses semi-structured interviews with five firms as his main research method for this. Akimowicz et al. (2016) use 24 in-depth interviews, of which 21 with farmers and three with experts on the policy platform studied, to identify drivers for farmers' investment decision-making aiming to understand the impact of a specific policy on farm investment, a similar aim to the aim of the current research. McCluskey et al. (2010) use semi-structured interviews with 16 financial analysts and fund managers to identify their perception of a set of processes concerning dividends. Jaiyeoba & Haron (2016) use semi-structured interviews to study the investment behaviour of Malaysian stock market investors.

In creating an interview guide there are five steps (Kallio et al., 2016). First, the appropriateness of using a semi-structured interview should be determined. Turner (2010) states the researcher needs to be able to determine some relevant areas of investigation of the phenomenon based on previous knowledge before the interview. Furthermore Bariball & While (1994) state this method is suitable for studying people's perceptions and opinions and Cridland et al. (2015) state this method makes it possible to focus on the issues that are meaningful for the interviewee, and it allows for diverse perceptions to be expressed. The diverse opinions and perceptions held by

interviewees hold the information wanted for this study, therefore a semi-structured interview is deemed appropriate.

The second step is to retrieve and use previous knowledge for a predetermined framework (Bariball & While 1994; Turner, 2010; Schmidt, 2004). It is important to have a good grasp of the substance (Rabionet, 2011) and this can be achieved through an extensive literature review (Bariball & While 1994; Krauss et al., 2009). The literature review has been discussed in chapter two of this thesis and provides the ground for both the questions posed and the predetermined framework including possible answers to these questions. The third step is to create a preliminary interview guide, a list of questions which directs the conversation towards the research topic(s) during the interview (Åstedt-Kurki & Heikkinen, 1994; Krauss et al., 2009; Cridland et al., 2015; Whiting, 2008). The loose set-up of the interview allows for dialogue and the possibility to change the order of the questions if necessary (Dearnley, 2005). The aim is to generate answers that reflect the interviewees' personal perceptions (Whiting, 2008), which allows new concepts to emerge from the data (Dearnley, 2005; Krauss et al., 2009). Follow-up questions can be pre-designed (Whiting, 2008; Rabionet, 2011) or asked spontaneously (Whiting, 2008; Turner, 2010; Chenail, 2011).

Based on the conducted literature review three sections of questions were formulated. These sections are environmental sustainability reporting, subsidies, and general factors of interest. Literature is inconclusive as to whether environmental sustainability reporting incentivizes environmental sustainability investments or makes them more likely to be executed. Porter and Van der Linde (1995) have claimed this to be the case, whereupon many authors have both corroborated and rejected their findings (Van Leeuwen and Mohnen, 2017; Rubashkina et al., 2015; Horbach et al., 2013; Horbach, 2008 and more, mentioned in chapter two). Thus, the question is posed what induced the investment and whether environmental sustainability reporting played a part in this process. Logically, the question follows what the firm does in the realm of environmental sustainability reporting. This makes sure the option of environmental sustainability reporting taking place but it not inducing environmental sustainability investments is covered. Finally, the question is specifically posed whether reporting has led to the identification of possible investment opportunities, which may or may not have been executed. This once more serves to cover all theoretical possibilities regarding the relation between environmental sustainability reporting and environmental sustainability investment opportunities.

The next set of questions covers sustainability subsidies. Literature is inconclusive as to the effect of these on willingness to invest and therefore the effectiveness of the policy instrument in this case. For example, Horbach et al. (2013) and Jove-Llopis & Segarra-Blasco (2018) find no evidence for this effect, whereas Horbach (2008), Czarnitzki et al. (2011) and Pen & Liu (2018) do. Investments are mostly viewed from a financial viewpoint (Markowitz, 1952) and subsidies are a financial instrument. As the aim is to find out whether subsidies are effective policy instruments questions are posed concerning whether subsidies or tax breaks were used, whether they were required for a financially sound business case and whether the investment would have been executed had the subsidy or tax break not been present. One more question in this regard concerns the place the investment took place in, namely whether the subsidy was a reason to execute the investment specifically in the Netherlands as opposed to another country. A concurring answer to this question would be another indication of effectiveness of the policy instrument.

The final set of questions concerns the other relevant factors at play and the trade-off between profitability, risk and sustainability performance made in the investment decision. Markowitz (1952) states profitability and risk are the most important factors at play in investment decisions. Contemporary literature, however, finds many more factors to be relevant. Bossle et al. (2016) give a wide variety including external and internal factors. Internal factors include environmental leadership and culture in the firm. It is therefore relevant to question how attitudes to sustainability interplay with the classic factors of probability and risk in considering an investment. Finally, to add to the literature, the question is posed what other factors were all relevant in the decision.

The fourth step is to test the guide, which can be done internally with a critical review of the guide by the research team or the researcher. It can also be done externally by specialists outside the research team, or it can be tested with potential participants. This was done both internally by reviewing the questions at a later moment again, and externally by letting field experts review the questions. The final step is to include the complete guide in the paper, which will be done here in the appendix (See Appendix 1).

3.2 Documentation

Apart from interviews, the second method used in this study is analysis of relevant documents, such as business cases for investments and public annual (sustainability) reports. This allows for a direct insight into the underlying documents used when engaging in a decision-making process,

and thereby makes it possible to judge the financial side of the investment more objectively. Insight into public annual (sustainability) reports and other sustainability documents such as CO₂ footprints or CO₂ inventories enable the researcher to gain insight in the message the firm wishes to share more broadly regarding sustainability. To the extent that these documents are assured by auditors, they can provide certainty on the sustainability performance of these firms. CO₂ footprints and CO₂ inventories are used for internal insight or to receive external certification of greenhouse gas reduction efforts such as through the Dutch CO₂ performance ladder (SKAO, 2020). The interviews provide the perceptions of the people involved, whereas these documents provide the objective information which, combined with the perceptions of the decision-makers, leads to a decision.

3.3 Data collection

Four forms of data were collected for this study: interviews, business cases, sustainability reports and websites. The websites are openly available and were consulted to find general information about the firms and to investigate the degree to which sustainability plays a role in the online presence of the firm. Sustainability reports were investigated insofar as they were available for the firms in this study. Most reports were freely available online, one report was received in print at the interview. The content of these reports was consulted both for its content and on a meta-level with the aim of finding out what each firm's standing is regarding sustainability, and what they want to present in their sustainability report. Business cases for the discussed investments were studied to check the trustworthiness and correctness of the interviewees' claims regarding the financial side of the investments. These business cases were not public and were requested in the interviews and sent afterwards by the interviewees. The final and most important form of data collection is interviews. By going through online firm catalogues 127 firms in different sectors were contacted and requested to participate in a study concerning environmental sustainability investment decisions (see Table 1 and Appendix 2). The main sectors contacted were waste processing & collection, chemicals, and furniture production. These sectors were focused on based on an informative conversation with people in the field regarding possibly interesting firms, and the researcher's own interest field and reasoning as to which sectors may provide interesting cases. Firms in these sectors often have opportunities to improve sustainability performance through reduction of direct or indirect emissions from their production processes.

Table 1: overview of firms contacted, and interviews conducted per industry

| Industry | Number of firms contacted | Number of interviewees |
|--|----------------------------------|-------------------------------|
| Waste processing & collection | 36 | 5 |
| Chemicals | 39 | 3 |
| Advice | 3 | 1 |
| Renewables | 2 | 1 |
| Industrial | 9 | 1 |
| Agriculture | 1 | 0 |
| Metallurgy | 5 | 1 |
| Printing | 1 | 0 |
| Packaging | 3 | 0 |
| Resources | 1 | 0 |
| Food and beverages | 9 | 0 |
| Furniture | 17 | 5 |
| Soil investigation | 1 | 2* |
| Total | 127 | 19 |

*: two interviewees represented the same firm, from the soil investigation firm

After contacting these firms, those that reacted positively were further invited to participate. The firms themselves were asked which person within the firm would be most suitable to interview regarding the topic of the study, the firm then put forward that person. Next, an interview date and place was agreed to: eighteen of the interviews took place via Microsoft Teams, one interview took place physically at the firm itself. Self-selection by the firm of the interviewee has not seemed to pose any issue, as no spokespeople were put forward. All showed to have substantive knowledge of the relevant aspects of environmental sustainability investments in their firms.

At the start of each interview, the researcher introduced himself and asked the interviewee to tell something about the firm, their position in the firm and anything else they might want to share. Afterwards, the procedure of the interview, including steps undertaken afterwards, were discussed,

before asking permission to start the recording for the interview (specific steps are laid out in Appendix 1). The previously described steps are recommended by Qu and Dumay (2011) to make the interviewee feel at ease. After the interviews, the recordings were transcribed and summarized in a member check which was sent to the interviewees for approval. Specific information regarding each interview including duration, function title of the interviewee and sector of the firm can be found in Appendix 3. Seven interviewees were in the financial department of the firm, four interviewees in technology & innovation, two in project management, one was the CEO, one was in the tax department, one in the sustainability department and one in operations and sales.

3.4 Data analysis

The data analysis consists of two parts, the development and use of a predetermined framework and coding, structuring and analysis of data. These will be discussed below.

3.4.1 Predetermined framework

Based on a thorough literature review, a framework of questions for the interview is set up. Section 3.1 discusses which questions were asked, based on which theoretical grounding. The framework is used as a structure for the interview to be able to gather all relevant information the interviewee has. First, we want to know what lead them to the idea of making the investment in the first place, that is the first question asked after requesting basic information on the investment concerned. A set of possibilities is: they were made aware of the possibility through competitors (Cai and Li, 2018; Daddi et al., 2016; Chen et al., 2018; Bossle et al., 2016), by engaged customers or other stakeholders (Berrone et al., 2013; Alan et al., 2013; Zhu, 2016), they developed the idea in their own R&D department (Bossle et al., 2016; Jove-Llopis & Segarra-Blasco (2018), present or future regulation pointed them to the opportunity (Triguero et al, 2013; Horbach, 2008; Porter and Van der Linde, 1995; Doran, 2012; Horbach, Rammer & Rennings, 2012). For this research the most interesting possibility is environmental sustainability reporting as a source of the idea (Porter and Van der Linde, 1995; Steinmeier and Stich, 2019; Zhou et al., 2019; CSRD, Directive 2022/2464/EU, 2022). For this latter option a specific sub-question is asked, namely whether environmental sustainability reporting played a part in becoming acquainted with the opportunity.

To expand on this, the question is asked what the firm does in the field of environmental sustainability reporting.

The next question concerns what showed this could be a (financially) interesting investment and whether it could be a financially interesting investment at all. Profitability and risk are usually two main factors here (Markowitz, 1952; Merton, 1969; Samuelson, 1969; Li and Ng; 2000), but other factors may be relevant here too. Per firm it may differ whether a proper business case is set up in which costs and benefits are analysed methodically and presented clearly to provide a strong rational argument for or against the investment on a financial basis. Therefore, it is relevant to know whether or not firms have made such a business case and had a clear sense of the financial consequences of the investment. If such an analysis is not made, decisions may be made based more on intuition of the manager and other factors become more relevant to the situation in which a business case is written up.

Second, we want to know what factors were at play in making the decisions. From the literature a wide set of possible drivers of investments into environmental sustainability can be identified (Diaz-Garcia et al., 2014; Horbach, 2008; Triguero et al., 2013; Horbach et al., 2013; Bitat, 2017; Frondel et al., 2007; Bossle et al, 2016; Saunila et al., 2018; Kesidou & Demirel, 2012; Bansal & Roth, 2017; Cai and Li, 2018; Agan et al., 2013; Chen et al., 2018; Qi et al., 2010; Pereira & Vence, 2012; Leenders & Chandra, 2013; Chang & Chen, 2013). These can be split into different categories. There are external drivers, which can be partly split according to institutional theory, internal drivers, and other relevant factors:

- Internal drivers
 - Risk
 - Return on investment
 - Technological capacity
 - Material price
 - Energy price
 - Market share
 - Access to information
 - Managerial environmental concern
 - Environmental Management Systems or Quality Management Systems
- External drivers:

- Coercive pressure
 - Existing norms and regulations
- Normative pressure
 - Customer pressure
 - Fiscal incentives
 - Access to subsidies
 - Legitimacy
- Mimetic pressure
 - Competitor pressure
 - Competitive advantage / prospect of expanding market share
- Other relevant factors
 - Future norms and regulations
 - Cooperation with knowledge institutions
 - Firm size
 - Market characteristics

Specifically, the availability of subsidies, environmental management systems and norms and regulations, both existing and future ones, are the main drivers of interest for this research. During the interviews the interviewees were specifically questioned on these main drivers of interest but were invited to elaborate on the other drivers present in their decision-making process too.

Concerning environmental sustainability reporting the interviewee was specifically asked which role it played, whether it increased awareness concerning environmental sustainability and thereby provided an incentive for the investment. This, as mentioned previously, is one of the aims of CSRD (CSRD, Directive 2022/2464/EU, 2022) and is therefore highly relevant information to extract from businesses.

Next, subsidies were investigated more thoroughly as possible driver. First the interviewee was asked whether the business made use of a subsidy or tax break for the investment, and if so, how they were made aware of the existence of this instrument. Second, they were asked about the role the subsidy played in the investment decision making process, whether it was necessary for a financially sound business case. Literature is inconclusive as to whether subsidies are correlated with higher uptake of environmental sustainability investments or not (Chen et al., 2018; Mateut, 2018; Cuerva et al., 2014; Horbach et al, 2013; Jove-Llopis & Segarra-Blasco, 2018; Czarnitzki et

al., 2011; Triguero et al., 2013). Multiple possibilities exist here concerning the relevance of subsidies in the investment decision-making process. The subsidies can be critical to the investment, so without the subsidy the investment would not be made. Depending on the subsidy, the firm may not see the possibility to engage in the process of applying for the subsidy due to the amount of time and resources it takes to do the application. The fund for the investment may be small, causing increased uncertainty around whether it will be rewarded, or the fund may already be exhausted by the time the firm wants to apply for it. Depending on the criticality of the subsidy for a positive business case the hurdles present when applying for the subsidy may become more salient. A final interesting question concerning subsidies and tax breaks specifically is whether the business would have enacted the investment without being rewarded the subsidy or tax break either way. If this is the case, this provides a highly relevant insight for policymakers concerning the usefulness of such policy instruments. Interviewees representing international firms are asked whether the subsidy was or is a reason to invest in Europe or in the Netherlands specifically and not somewhere else. This can be interpreted as a different form of a similar question asked previously, namely whether the firm would have engaged in the investment without the subsidy too. This earlier question was however posed in the context of a financially sound business case, whereas here we take the extra dimension of geographical space into account.

Furthermore, the question was posed which factors are at play generally when engaging in such a decision. As shown before, literature provides a broad set of factors that are said to influence the decision-making process concerning an environmental sustainability investment. This includes among other things current or upcoming regulation, managerial environmental concern, competitive pressure, customer demand, cooperation with knowledge institutions and many more. The interviewee was hereby invited to elaborate on the factors they perceived to be the most salient concerning the investment discussed.

Finally, the interviewees were asked what weight is attributed to environmental sustainability as a goal compared to profitability and risk, and thus whether environmental sustainability investments are allowed to come at a (short term) cost compared to non-environmentally sustainable investments. Reasons for this can be environmental managerial concern, customer demand or competitor pressure for instance. Another reason can be a determined long-term focus, including both long-term financial interests as well as considering possible future regulations, thereby considering possible future costs of not engaging in environmentally sustainable

investments. This fits with literature on CSR and the Triple Bottom Line approach (Cubas-Díaz and Sedano, 2017; Elkington, 1997).

Through this line of questioning, more specifically shown in the Appendix 1, the main drivers for environmental sustainability investments should be uncovered, including specifically whether environmental sustainability reporting and subsidies were significant drivers of these investments.

3.4.2 Coding, structuring & analysis of data

Based on the predetermined framework and the themes that have come up during the interviews, the transcripts were coded. The answers to the questions posed to the interviewee as well as other interesting comments made were highlighted to be able to structurally gather all relevant information provided in the interviews. Next, these highlighted elements were gathered and structured based on the questions asked, added with a category of other interesting comments. Proceeding, the comments were coded based on their relevance for the different propositions, added with other relevant recurring themes. After structuring the answers given based on propositions, an analysis was made of the different positions held by the interviewees concerning each proposition. This then made further analysis of the proposition possible. A similar process was conducted for the analysed public (sustainability) reports and websites of the firms to include all relevant information to the different propositions as well as other relevant information. Through this process, drivers as well as non-drivers of environmental sustainability investments were identified, allowing for the confirmation or rejection of propositions.

3.5 Propositions

Based on the literature review a set of propositions is deduced. These will function as part of the predetermined framework for the interviews. Furthermore, they will be used as hypotheses for this research. They are presented below:

Proposition 1: engaging in environmental sustainability reporting increases the awareness of possibilities for investing in environmental sustainability performance.

Proposition 2: availability of subsidies increases the willingness to invest in environmental sustainability performance.

Proposition 3: environmental managerial concern is essential for the willingness to invest in environmental sustainability performance and the degree to which it is allowed to come at a short-term financial cost.

Proposition 4: engaging in environmental sustainability reporting makes firms more prone to apply for environmental sustainability investment subsidies.

Through the interviews, the document analysis and web research, these propositions will be inquired into. The aim is to find out whether they hold or not. Whether or not they hold will be discussed in chapter four.

4. Results

The results of the research conducted will be discussed and analysed in this chapter. The results and analysis will be discussed along the lines of the four propositions. An overview will be given of what the interviewees of the different firms have stated per proposition, after which these findings are analysed in the context of the literature in the field. Other findings will be presented in chapter five. In this chapter the specific interviews will be referred to by their interview number, an overview of these is available in Appendix 3.

4.1 Proposition 1: engaging in environmental sustainability reporting increases the awareness of possibilities for investing in environmental sustainability performance.

As mentioned in chapter two, one of the potential outcomes of environmental sustainability reporting is that firms' awareness increases concerning the possibilities regarding investments which increase the firm's environmental sustainability performance. The literature is not conclusive regarding this statement. From the nineteen interviews conducted for this study multiple aspects arise regarding this proposition. These will be discussed in turn below. There is overlap in the categories, interviewees 8, 7 and 12 in the fourth category are also represented in respectively the first, second and third categories. The fourth category concerns internally aimed reporting, which should be reviewed separately from externally aimed reporting. After discussing these four categories another overlapping category of firms is discussed, containing firms stating their clients demand improved environmental sustainability performance from their suppliers for

their own scope 3 emissions as part of their environmental sustainability reporting aims. Next, expert insights will be discussed garnered in the conversation with the subsidy advisor. Consecutively, the investment opportunities presented in documentation will be discussed. Lastly, concluding remarks based on this proposition are discussed.

4.1.1 Category 1: Environmental sustainability reporting requirements increase the ability to make choices based on data but has not spurred this specific investment decision.

Interviewees 1, 2, 3, 6 and 8 indicated environmental sustainability reporting can make or has made it easier to make environmental sustainability investment decisions. Interviewee 6, the environmental subsidy advisor, indicated the same. The firms that stated this were varied in nature and size, with three firms being active in waste collection and processing (interviewee 1, 2 and 3) and two in industrial production, of which one was a large (8) and one a small firm (6). The waste collection firms are private firms, but their clients are local and regional governments. The other firms are private firms producing for other businesses. They stated the specific investment decision discussed was not spurred by reporting, but other environmental sustainability investments have been, or they firmly believed it would in the future help them make choices in this regard.

4.1.2 Category 2: Environmental sustainability reporting has not (yet) caused increased awareness for environmental sustainability investments.

Interviewees 5, 7, 10, 16 and 17 indicated environmental sustainability reporting requirements have of yet not been a driver for environmental sustainability investments. Three categories can be discerned here. The first is a set of two firms (5 and 7), both waste collection and processing firms, which indicate they were already heavily engaged in sustainability-improving measures, they already gathered great amounts of data concerning (environmental) sustainability performance. Requirements in this field simply did not add much in terms of newly gained insights and therefore did not increase awareness for said investment options. The second category (interviewee 17) concerns only one firm in this study, which is a listed firm and is therefore of considerable size. Size is one of the two reasons why reporting requirements have not led to identification of new investments possibilities in this regard. The departments of the firm

concerned with reporting and investment decisions are simply too far apart in terms of organisational distance. They do not engage with each other regularly and exchange acquired insights. The reporting requirements are mainly a burden on the reporting staff. This is a mechanism thus far not uncovered in literature reviewed preceding this research. Interviewee 17 claimed this caused the proposed mechanism not to function. Interviewee 18, representing the same firm, however answered affirmatively to this proposition in stating that reporting forces a firm to make vague ambitions more concrete and thereby helps in identifying new investment opportunities. The two representatives, however, allude to two different aspects of environmental sustainability reporting. The former alludes to the gathering of the numbers and figures only, whereas the latter alludes to the formulation of the stated goals regarding sustainability in a more concrete manner in a sustainability report. The second reason for the mechanism not to work, specific to this firm, is their large R&D team which has been active in developing efficiency-improving measures for a long time, which includes environmental sustainability-improving measures. Therefore, most obvious possibilities in this regard have been exploited in the past. It must be noted that one of the other firms interviewed, also of considerable size, did not raise this issue as in their specific case the emissions of the greenhouse gas they could reduce were not the result of an inefficiency in the production process. The final category includes two firms which stated they were not yet engaged in environmental sustainability reporting at all therefore it can also not have increased their awareness to environmental sustainability investment opportunities.

4.1.3 Category 3: Environmental sustainability reporting requirements have led to increased awareness for environmental sustainability investment opportunities.

The third category of firms includes four firms (interviewees 11, 12, 15 and 18) which stated environmental sustainability reporting (requirements) have led to increased awareness and/or willingness to invest in environmental sustainability. One large chemical firm (interviewee 11) indicated that a form of environmental sustainability reporting led them to report on a new set of emissions indicators which they had not reported on before. This new form of reporting indicated a particularly high amount of emissions of a certain greenhouse gas, this led the firm to search for ways to reduce this type of emission and has as a result led to the discussion of a sizeable investment in a new installation to reduce this type of emission. Two other firms (interviewees 12 and 15) indicated it has spurred them to engage in this type of investments identified in part due

to their reporting commitments. The reporting commitment increases the willingness to engage in this type of investment as the firm can be held accountable based on its own formulated goals and ambitions. The final firm in this category (interviewee 18), a listed firm, indicated reporting requirements helps to move from vague aspirations regarding environmental sustainability towards concrete targets and goals, which come with specific investment needs and opportunities.

4.1.4 Category 4: Internal environmental sustainability reporting has led to identification of environmental sustainability investment opportunities.

The fourth category of firms includes firms that engaged in their own form of internal environmental sustainability reporting, for instance through working out the CO₂ footprint of the firm, where implicitly one of the aims was to find environmental sustainability investment opportunities. Seven firms indicated that different forms of internal reporting led to identification of new environmental sustainability investment opportunities. Three of these firms are furniture production firms (12, 14, 15), one is a waste processing firm (7), two are chemical production firms (13, 19) and one is an industrial production firm (8). They all indicated they had engaged in either a CO₂ footprint analysis or a ‘CO₂-prestatieladder’-analysis to identify their performance in terms of CO₂ emissions as well as emissions of other greenhouse gases. This led them to identify opportunities to invest and improve their environmental sustainability performance, for instance through installing solar panels (8, 14, 19), installing heat regeneration installations (13), installing a hydrogen generator and supplier for a gas-powered oven (12, 15), or even investing in a new factory (7). These types of analyses turn out to be useful for identifying investment opportunities. It must be said, however, that they are often done with that specific goal in mind from the start. That is what makes them different from types of reporting which are required by regulators.

4.1.5 Environmental sustainability reporting of clients leads to demands for more environmentally sustainable products and services and thus sustainable investments

A fifth set of firms indicated that their clients demand environmentally sustainably produced goods or services from them. One of the reasons for this is that they want to score well in their own environmental sustainability reports, specifically they aim to lower their scope 3 emissions (emissions from activities in the value chain of a firm from assets not owned by the firm).

Therefore, not so much the reporting requirements of the firm itself, as well the reporting requirements of the client firms lead to demands for sustainably produced products and services, which may induce environmental sustainability investments. This fits with findings in the literature such as Bossle et al. (2016) and Chen et al. (2018) who find client demands can spur environmental sustainability investments and with similar findings by Berrone et al. (2013), Alan et al. (2013) and Zhu (2016). They did not specifically include the reason for these demands to be environmental sustainability reporting requirements, however. Thus, it was no part of the predetermined framework and makes for an interesting finding adding to literature. Two waste processing firms (interviewees 5 and 7) and three industrial producers (interviewees 8, 15, 18) stated this was an important factor in terms of the investment opportunities they considered. Furthermore, the subsidy advisor (interviewee 4) indicated this is something they heard from their clients regularly as a reason for engaging in the environmental sustainability investment. Finally, the firm building green hydrogen plants (interviewee 9) stated this is one of the main reason energy firms engage with them, to improve their own environmental sustainability performance, and thereby their reporting metrics.

4.1.6 Expert insights

The environmental subsidy advisory firm (interviewee 4), which should have insight in the role environmental sustainability reporting plays in identifying investment opportunities for which they are requested to aid in the subsidy procurement, states CSRD is and can be a starting point to identify opportunities to improve environmental sustainability performance. The advisor thereby answered affirmatively to the first proposition. The extent of this effect is mediated by the size of the firm. As stated above, in large firms the people engaged with sustainability reporting are in different departments than the people engaged with identifying investment opportunities, or the people engaged in the decisions regarding these investment opportunities. In smaller firms these people may communicate more and exchange their findings more, or they may even be the same people, thereby increasing the possibility for reporting requirements to lead to newly identified environmentally sustainable investment opportunities. This statement can be corroborated by the findings from the conducted interviews, with the largest firm pointing to precisely this notion (interviewees 17 and 18), and the smallest firms stating that analyses of their CO₂ footprint and other related reporting requirements led them to new environmentally sustainable investment

opportunities (interviewees 6, 13 and 14). Furthermore, the subsidy advisor (interviewee 4) said reporting does provide impetus to improve environmental sustainability performance in general for reputational reasons, and thereby spurs investments in this regard.

4.1.7 Investment opportunities presented in documentation

Document analysis shows annual (sustainability) reports are multifunctional with respect to environmental sustainability investments. First, concrete results in numbers and figures in terms of sustainability performance are presented. Second, in many cases specific investments that have been done are showcased to visualise the activities undertaken by the firm in this regard and to visualise the numbers and figures presented. Third, strategies are presented for the way forward in this regard. Opportunities are identified for how to further improve environmental sustainability performance. Fourth and finally, these opportunities in some cases are analysed in terms of feasibility, cost, impact, and other relevant factors.

The eight firms with public sustainability reports, representing nine interviewed firms, one firm is a subsidiary company of another, all present their environmental sustainability performance in numbers and figures and included broad strategies for their future environmental sustainability performance (interviewees 1, 3, 5, 7, 11, 12, 15, 17/18 and 19). All except the firm of interviewee 11 included examples of what they had done in this regard in the past year(s). Finally, the firms of interviewees 1, 3, 12, 15 and 17/18 included more concrete investment opportunities and ways to proceed in the future to improve environmental sustainability performance. The degree of concreteness of these investment opportunities differed per firm. Whereas some firms identify semi-clear research and investment opportunities flowing from the broader strategy, others wrote up a list of specific investment opportunities including a multi-criteria analysis for each of these to determine which opportunities were most effective and feasible.

4.1.8 Concluding remarks on proposition 1

Concluding the analysis of this proposition, environmental sustainability reporting in full is indicated to aid in increasing awareness for environmental sustainability investment opportunities, with thirteen out of seventeen firms interviewed confirming this proposition. This fits with findings in the literature by Porter and Van der Linde (1995), corresponding to the Weak PH, and thus

fitting with findings by Rubashkina et al. (2015), Chen et al. (2018), Cai and Li (2018), Horbach (2008), Van Leeuwen and Mohnen (2017), Lanoie et al. (2011) and De Vries and Withagen (2005), furthermore corroborated by Steinmeier and Stich (2019) and Zhou et al. (2019). In most cases this works directly, through the identification of investment opportunities due to gathering the necessary information for the report. In some cases, it works through the reporting requirements of downstream firms, pressuring their suppliers to improve sustainability performance through specific investments. It does seem to be the case that the mere gathering of sustainability metrics at large firms, such as listed firms, does not contribute to the identification of new investment opportunities as such. The formulation of strategies and goals in this regard, which is also part of environmental sustainability reporting requirements in most cases, does aid in this regard. These results were found specifically for willingness to engage in environmental sustainability investments, however similar processes could work to incentivize social sustainability investments, improving worker safety for instance. There, awareness should also be a contributor to identification of opportunities for improvement. Furthermore, the finding that formulating goals was a main cause for identification of investment opportunities could also be valid in different contexts, such as social and governance sustainability.

4.2 Proposition 2: availability of subsidies increases the willingness to invest in environmental sustainability performance.

The second proposition developed based on the literature review and motivation for this study concerns the effect of availability of subsidies on the willingness to invest in environmental sustainability performance. As mentioned in chapter two subsidies can be divided into different types: GSAs and GSBs (Peng & Liu, 2018). Interviewee 4 subdivided the latter category into ‘middle’-type subsidies and the so-called ‘Champions League’ subsidies. Here the ‘middle’-type subsidies are subsidies an individual entrepreneur or firm can request and for which possibly a relatively simple project plan has to be handed in with the authorities. The ‘Champions League’ subsidies are large grants often rewarded by the European Union, which can only be acquired through a cooperative effort with multiple firms as well as knowledge institutions. The trajectories for these subsidies are longer and the amount of effort put into acquiring these subsidies is larger.

This section will proceed as follows: first the general conclusions inferred on this topic from the interview with the subsidy advisory firm will be presented and analysed. Next, the investments

discussed in the interviews will be discussed and analysed according to this division of subsidies presented above, together with a fourth possibility: no subsidies or tax breaks were considered or available. In total, 22 investments were discussed. Five firms (interviewees 3, 5, 6, 10 and 15) discussed two investments each. These separate investments will be indicated by the interview number followed by '.1' or '.2'. One investment was discussed twice by two interviewees from the same firm, interviewees 17 and 18. The subsidy advisory firm discussed no specific investments and thus does not contribute to the 22 discussed investments. Lastly, conclusions drawn from these results are discussed.

4.2.1 Expert insights

Multiple aspects to subsidies were raised in the interview with the subsidy advisory firm. First, subsidies can be both the proverbial carrot and the proverbial stick to engage in investments. They can act as a carrot in the sense that they are a financial incentive which makes that investment option more attractive compared to the non-sustainable option. Once firms have committed to the subsidy request procedure, their signature for that commitment can be used as a stick by the advisory firm to push them to move forward with the investment procedure. The latter aspect of subsidies is mainly at play in the 'middle' and 'Champions League' subsidies, the GSBs. Second, subsidies and tax breaks may not always be taken into the business case at the start of the procedure and therefore play no part in the investment decision. For tax breaks, GSAs, this is often because one department in the organization is engaged in the investment decision, while another has the fiscal knowledge about possible tax breaks. This leads to the situation that the tax break may be rewarded but had not been part of the business case. Opportunities for GSBs may also be missed if the firm requests the aid of a subsidy advisor too late in the process, or it starts looking into the possibilities for subsidies too late itself. By then certain choices may already have been made which prohibit them from applying for an otherwise relevant subsidy, or certain deadlines for application have already passed. Both of these issues can be resolved. Tax breaks are in some cases already included in an offer by a supplier, as became clear from the business cases reviewed as a part of this study. Firms may also decide to work with a subsidy advisor for every or most investments to check for possible subsidies or tax breaks. Multiple interviewees indicated their firm did precisely this. A third, interesting, aspect raised is that firms tend to be prone to apply for well-known subsidies and grants, precisely because they are well-known. This however means that

many firms apply for that subsidy or grant, making the probability of being rewarded with the subsidy or grant increasingly smaller. Therefore, applying for less well-known subsidies or grants can often be very useful, this does however require some more work on behalf of the firm or its subsidy advisor. The fourth aspect raised was that even though the request for a subsidy may not be granted, engaging in the application procedure may still be fruitful. The application may have opened the eyes of people in the firm to new possibilities, setting them on a new course, they may even continue with the investment even though the subsidy has not been rewarded because they have identified other convincing advantages related to the investment. This again only counts for the middle and Champions League subsidies. Fifth, many subsidies that are oversubscribed are rewarded based on a draw of lots. This is very fair in a judicial sense, whereas from an entrepreneurial point of view it is very impractical, as there is no certainty as to whether the firm will be rewarded with the subsidy or not until the draw takes place. Due to the uncertainty following inherent to this procedure the importance of the subsidy in the decision-making process is decreased.

4.2.2 Government Subsidies Afterwards (GSAs), tax breaks: core subsidies

Of the 22 investments discussed, ten concerned tax breaks or so-called core subsidies. These were mainly the Dutch 'EIA', energy investment reduction, and 'MIA', environmental investment reduction. Four categories of experiences regarding this type of subsidy, the tax break, can be discerned from the conducted interviews. The first category contains six interviewees (2, 5.1, 8, 12, 13 and 15.1), these interviewees stated the tax break was not necessary for the business case to be a financially viable and interesting one. The investment would have been done without the tax break just the same, the financial incentive was not sizeable enough to make a difference in that sense. Two interviewees (5.1 and 12) specifically stated an available subsidy or tax break should not be the reason to engage in a certain investment. It is interesting to note that these two firms were highly motivated for improving their sustainability performance, based on the interviews as well as the documents reviewed, in this case a sustainability report and a year report. The second category contains two interviewees (16 and 19), these interviewees stated the tax break was not necessary for the business case to be financially viable, but it did help in improving the financial outlook of the investment. It was a factor that moved them towards the investment, but not receiving the tax break would not have been a reason not to engage in the investment. The third

category concerned one firm (interviewee 6), which stated they had already made the decision to invest and only afterwards found out they qualified for this tax break. Therefore, it played no role in their decision due to lack of awareness. Finally, a tenth firm (interviewee 10) did look into applying for a tax break but decided the benefits did not weight up to the costs.

An analysis of these findings leads to the conclusion that core subsidies, GSAs, in the form of tax breaks were not relevant for whether or not the investment would have been made. All ten cases considered made this same claim. Two of them did say it made the investment more attractive, but they would have gone through with it either way. This corresponds to a part of the literature that finds no relation between tax-subsidies and willingness to invest, such as Triguero et al. (2013), Jove-Llopis & Segarra-Blasco (2018) and Horbach et al. (2013). Czarnitzki et al. (2011) does however find evidence for the effectiveness of R&D tax credits at spurring innovation activities, as do Brouillat and Oltra (2012) and Bitat (2017).

4.2.3 Government Subsidies Beforehand (GSBs), simple: middle subsidies

Of the 22 investments discussed, nine concerned middle subsidies, simple GSBs. These nine firms stated the subsidy made the investment financially interesting and viable. This corresponds to literature affirming the importance of subsidies in environmental sustainability investment decisions such as Bossle et al. (2016), Cai and Li (2018) and Chen et al. (2018). Investments 1 and 3.1 concerned an acquisition subsidy for an electrical truck. Interviewee 1 stated they probably would have made the investment without the subsidy too due to other factors, the most important of which are the image of the firm and the wish to keep up with their peers in industry. This is a private company working for local governments in waste processing and collection, which prides itself on sustainability, therefore an electrical truck fits better with their image than a diesel truck. The other firm (interviewee 3.1) is similar but has less worries about image in this regard and therefore is more concerned with the financial side of the investment.

Two other cases concern a set value of produced green natural gas or a subsidy for each produced unit of green hydrogen gas. One waste processing firm invested in an installation that can produce green gas from biomass (investment 5.2), however, to make this financially interesting it is necessary for the government to top up the price of green gas with a subsidy. The other case (9) concerns green hydrogen gas plants, which acquire about a fourth of their income from the government top-up on green hydrogen gas, a subsidy per unit produced.

Two cases (6 and 14) concern the SDE++-subsidy for investing in solar panels which provides a minimum price solar electricity. This is however no longer rewarded due to currently high energy prices. Both stated the SDE++-subsidy made the investment financially interesting, but no longer does so.

The latter three cases were a large, customized subsidy for the replacement of a chemical installation (11), including environmental sustainability performance improvements, a subsidy for improving terrain and building environmental sustainability (10), and an environmental sustainability innovation subsidy for a new type of recycling factory (7). In all three of these cases the subsidy made the investment significantly more interesting from a business perspective.

Two firms specifically stated the subsidy was the reason in the first place for considering the investment (10 and 14), which makes the subsidy highly relevant in this case. Two stated they may have gone through with the investment without the subsidy due to other factors such as reputation, internal motivation for sustainability and keeping up with competitors (1 and 14).

In most cases the subsidy was said to be necessary to make the investment financially viable, thereby making the subsidy relevant. The firm engaged in the customized subsidy procedure with the government (interviewee 11) stated a subsidy is mainly an accelerator for something a firm would have done at some point in time, but the subsidy incentivizes the firm to do it now. Interviewee 14 corroborated this by saying they were incentivized to enact a certain investment now as opposed to later due to the finality of a subsidy program. Hereby the subsidy acts as the proverbial carrot, corresponding to findings in the literature by Chen et al (2018), Bossle et al. (2016), Weng and Lin (2011) and Bitat (2017) but does not fit with Triguero et al. (2013), Horbach et al. (2013) or Jove-Llopis & Segarra-Blasco (2018). Particularly effective middle subsidies are those that provide funding over a longer period of time, thereby giving certainty to a firm about their future revenue streams from the investment and extending the accepted payback period for the investment (stated by interviewees 6, 9 and 14).

4.2.4 Government Subsidies Beforehand (GSBs), complex: Champions League

The Champions League subsidies are different to the other subsidies in an important aspect, namely the number of parties involved. In the Champions League subsidies often many parties, both firms and knowledge institutions, are involved. One case (interviewees 17 and 18) concerned a European grant, in which a consortium of firms and organisations applied for the grant together.

The grant concerned the development of an innovative technique for propulsion. The subsidy in this case was an effective incentive to work on this innovative technique, but the financial side of it was not the most important reason why this subsidy was essential for staying engaged in this investment into a new technique. The most important factor of the subsidy was the fact that it was applied for in a consortium. The roll-out of the new technique requires mass, it requires many different firms to invest in the technique, and to invest in the new type of fuel necessary for this type of propulsion afterwards. By working on this innovative technique in this consortium, brought together in part due to the grant, all players involved show commitment to this technique, providing an impetus for other relevant players to play their own part in making this new technique viable. The financial impetus of this subsidy was not enough to make the investment into this new technique financially interesting. The fact that many different firms and knowledge institutions are working on it together, thereby giving out a credible commitment to other relevant players in the field, does make it interesting. The monetary aspect of the subsidy did make the investment more appealing but was not as important as the cooperative aspect of the subsidy. This aspect of subsidies has not been identified as important in the literature. Cooperation with suppliers, competitors and knowledge institutions has been identified as a driver of environmental sustainability investments (Bossle et al., 2016; De Marchi, 2012; Triguero et al., 2013), but its importance in relation to subsidies has not been highlighted.

4.2.5 No subsidies used or considered

Three firms (cases 3.2, 10.1 and 15) stated subsidies had not been a factor at all in their final investment decision. In case 10.1 the firm looked into applying for a tax break but stated the benefits of applying for the tax break did not weigh up to the costs. In case 3.2 no relevant subsidies could be found. This may have been due to the fact that it was mostly a technical replacement, which did significantly improve the environmental sustainability performance, but therefore was not specifically seen as an environmental sustainability investment from the perspectives of the authorities. This made it ineligible for tax environmental sustainability breaks. The final case (15) here concerns a firm that could not apply for any relevant subsidies because they are part of a larger firm, which makes them officially too large to apply for specific SME-tailored subsidies, even though their department within that firm is a firm in itself and would have been eligible for

such subsidies if it had been a standalone firm. Only one of these cases points to irrelevance of the fiscal incentive at hand.

4.2.6 Other aspects

Finally, concerning subsidies some more interesting aspects were raised. As stated above, multiple firms (case 5.1 and 12) stated that a subsidy or tax break should never be the reason to execute a certain investment. The investment should primarily *feel* proper, it should make sense business-wise and be useful, the subsidy should be a helpful incentive to make the investment financially more attractive, thereby increasing the probability that the firm will actually execute that investment. A subsidy should make the environmentally sustainable investment option more interesting than the non-sustainable one. Furthermore, the subsidy can act as an accelerator for an investment the firm would have executed anyway at some point due to other forces, but the subsidy makes the financial hurdle low enough to make the investment now. As mentioned, some firms prefer to have a business case that is financially sound without the subsidy, thereby always making the subsidy in some way superfluous. One interesting reason given for this standpoint by interviewees 8 and 16 is that some subsidies come with uncertainties, unclarities, or other issues at a later point which causes the expected subsidy not to be of the size as was expected. These types of surprises can be financially threatening to a firm if the investment is of a significant size. For subsidies which are given out in instalments over a longer period of time, firms will often adjust their demands for the maximum payback period of the investment to the period over which the subsidy is given out. So long as the payback period is shorter than the period over which the subsidy is given out, the subsidy is a proper incentive to execute the investment.

One incentive not yet discussed is a sustainability linked financing framework. This is an agreement with a creditor to have lower interest rates on credits so long as the firm scores sufficiently on predetermined metrics. This is not a direct subsidy for a certain investment, but it does provide an impetus to improve environmental sustainability performance, which often take place through investments. Therefore, this can be seen as an environmental sustainability subsidy.

Finally, interviewee 9 stated different types of government subsidies can be provided for green hydrogen gas production but one form was significantly preferable to other forms. The preferable form of subsidy is a subsidy per unit of product produced. This gives the most certainty and the firm can use it as an assurance for revenue when applying for other types of financing, such as

credit from a bank. Another form of subsidy is a lump sum payment, this is useful, but only a one-off payment. The third form is a tax break, but this is only useful afterwards, it does not provide up-front financing, and again cannot be used as financial assurance for receiving other forms of credit. The final form is certificates which other firms must purchase at your firm to be allowed to state they produce in a sustainable manner. These certificates, however, generally have a floating price, thereby giving little certainty as to the amount of funds that will be raised through this form of financing. Again, uncertainty regarding future revenue streams is problematic when applying for other forms of credit.

4.2.7 Concluding remarks on proposition 2

Concluding, the cases discussed indicate particular types of subsidies can be highly effective at increasing the willingness to invest in environmental sustainability performance, specifically GSBs can. GSAs tend not to be effective at this due to their limited financial contribution. Simple GSBs tend to be very effective in this regard due to their financial heft, they provide the necessary bridge in funding from an infeasible business case to a financially interesting one. Complex GSBs are effective not only due to their financial aspect but mainly due to the cooperative effort they entail. Furthermore, subsidies may put firms on a more sustainable track even though the subsidy is not rewarded. The uncertainty around whether or not a subsidy will be rewarded and the specific requirements for eligibility however decrease the effectiveness of subsidies at making investments more attractive. Generally, these outcomes suggest financial incentives to be useful incentives, but only from a certain point. This should hold generally for subsidies and fiscal incentives and could be applied to other contexts where governments attempt to incentivize firms through fiscal and financial incentives.

4.3 Proposition 3: environmental managerial concern is essential for the willingness to invest in environmental sustainability performance and the degree to which it is allowed to come at a short-term financial cost.

The third proposition contains two sub-propositions. The first states that environmental managerial concern is essential for the willingness to invest in environmental sustainability performance in general. The second adds the claim that this determines the degree to which

environmental sustainability investments are allowed to come at a short-term financial cost, for instance through a lengthy payback period for the investment compared to a non-sustainable alternative.

In the interviews conducted for this research interviewees were asked what factors played an important role in making the decision for this investment. Many in this regard included intrinsic motivation to act sustainably. We should make a distinction between intrinsic motivation and extrinsic motivation in this regard. The main interest for this proposition is intrinsic motivation, concern for reputation, however, can also be seen as managerial environmental concern and can be included in this proposition too. This section will also include the findings in web research and the annual (sustainability) reports of the investigated firms. What these firms proclaim on their websites and in their (sustainability) reports can be viewed as evidence of their proclaimed environmental concern.

4.3.1 Intrinsic motivation for environmental sustainability investments

Many interviewees state they and their colleagues are intrinsically motivated to contribute to sustainability, and this adds to their willingness to invest in it. Out of 18 firms interviewed, 16 were relevant in this regard and all stated they are intrinsically motivated to invest in sustainability. This fits with findings by Chang and Chen (2013), Qi et al. (2010) and Bossle et al. (2016). The two other firms were the green hydrogen plant builder and the subsidy advisory firm (interviewees 9 and 4). The interviewee of the latter stated leadership is essential in this regard, a company leader who is convinced of the need to act sustainably can take the company with them on such a path.

Reviewing the websites of the different firms shows almost all are concerned with sustainability and want to showcase their actions in this regard in some way or another. Fifteen out of seventeen firms that are relevant in this regard (only the subsidy advisory firm is excluded here) have information on their sustainability performance or commitment on their website, only interviewees 6 and 16 are excluded. The firms vary in the content, the depth, and the place on the website of this information. Some immediately present their sustainability ambitions on the homepage, others have a separate tab on the website, and others include it in their values. Still, almost all feel the need to include some information regarding sustainability on the website, thereby showing their concern and commitment to that cause.

Out of seventeen firms, nine have made information on sustainability publicly available through an annual sustainability report, a chapter on sustainability in the general annual report, or through publishing a ‘CO₂-prestatieladder’ or ‘MVO-rapportage’, a report on societally responsible entrepreneurship (interviewees 1, 3, 5, 7, 11, 12, 15, 17/18 and 19). They therein shared their dedication to environmental causes. Furthermore, a variety of firms, five out of eighteen relevant firms here (interviewees 2, 3, 10, 15, 17/18), claimed sustainability was ‘in their DNA’, suggesting that the firm always acts as sustainably as possible because it is in their entrepreneurial culture. Interviewees 7, 12, 13, 14, 17/18 and 19 claimed they aim to be a frontrunner in the market when it comes to sustainability, fitting well with findings by Kesidou & Demirel (2012) who state highly motivated firms are driven by possible benefits stemming from first mover’s advantage. Some others said they don’t want to fall behind (1, 3, 7, 17/18 and 19). This however seems less relevant as an impetus for investment as falling behind should have other negative consequences, whereas being a frontrunner often comes with costs. Four firms stood out in terms of the commitment to sustainability shown in their reports and on their website (interviewees 11, 12, 17/18 and 19).

Finally, two family firms were interviewed (interviewees 10 and 19), they were specifically concerned with the continuity of the firm, for which sustainability will be crucial. They aim to transfer the firm to the next generation with the possibility for them to transfer it to their children again. For that to be possible the firm should keep up with the times, which means improving sustainability performance. It also provides an impetus simply to contribute to slowing down climate change, which is part of their motivation. It must be stated that intrinsic motivation is virtually impossible to measure and can easily be claimed without cost by interviewees, therefore the actual effect this has in investment decisions should not be overstated.

4.3.2 Reputation as motivation for environmental sustainability investments

Concern for reputation is not direct intrinsic motivation, but as it is hard to quantify it should not be put in the same category of motivations as commercial interest should. In this regard we can distinguish between two motivations for acting sustainably relating to reputation. The first is the willingness to act sustainably as it brings a positive reputation. In theory that should lead to either a competitive advantage, which means more pricing power, or more clients. That however is hard to quantify even for scholars, let alone for most firms, therefore we can treat this as closely related to intrinsic motivation. The second motivation is the aim to prevent a negative reputation

due to a lack of action in the sustainability domain. If all peer firms have already started acting sustainably and your firm has not, this may become a reputational risk if clients want firms to act sustainably. Both these motivations were stated by firms, thirteen out of sixteen relevant firms stated positive reputation effects were a motivation for sustainability investments for them (all but interviewees 5, 11 and 14). This fits with literature on normative pressure, identified as a driver of environmental sustainability investments by Agan et al. (2013), Bansal & Roth (2017) and Hristov et al. (2022), however running counter to Qi et al. (2010). Reputation is one of the reasons for presenting their actions and results on their websites and in their annual reports. A relatively small number of firms stated negative reputation concerns were a motivation for sustainability investments, only five out of sixteen (interviewees 1, 3, 7, 17/18 and 19). These two aspects seem to indicate sustainability is not yet the norm. Therefore, acting sustainably now should garner positive reputation effects, only when sustainability becomes the norm will fear of negative reputation become a motivation for sustainability investments. Finally, interviewees 1 and 15 specifically stated they aimed to be congruent with their claims made online or in published reports. If the firm proclaims to act sustainably but does not do this in practice this may result in negative effects regarding reputation if media finds out and reports on it, or the employees may simply want to avoid cognitive dissonance with regards to their firms' sustainability claims.

4.3.3 Environmental sustainability investments are allowed to come at a cost

Regarding the question whether investments that improve environmental sustainability performance are allowed to come at a cost firms gave a variety of answers. First and foremost, most firms stated continuity of the firm is the most important and should not be put at risk due to an oversized costly environmental sustainability investment. Five firms explicitly stated this (interviewees 5, 9, 10, 11, 12), but it was implicit in all conversations. As Bossle et al. (2016), Markowitz (1952), Merton (1969), Samuelson (1969) and Li and Ng (2000) state profitability is important when making investment decisions, and profitability is essential for continuity.

A variety of firms gave different answers all pertaining to the notion that sustainability is allowed to come at a cost when comparing non-sustainable to sustainable investments. They all indicated sustainable investments are treated differently than regular investments. One firm specifically stated the more impact an investment has in terms of improvement of sustainability performance, the larger the accepted costs of the investment (interviewee 3). Interviewees 9 and

12 stated the smaller the cost of the investment in absolute terms, the larger the accepted difference in relative terms of the sustainable option in price will be. This goes back to the point about continuity of the firm, which will not be endangered by a small investment, therefore even a large price difference between the sustainable and non-sustainable option will be accepted. Interviewees 5 and 10 stated so long as the performance of the newly bought machine or installation is comparable to the old one, or the non-sustainable option, it is allowed to be a bit more expensive, in the range of ten per cent of the cost price. A point that was alluded to earlier when discussing proposition 2 is relevant here again: if a subsidy is paid out in instalments, the accepted payback period is stretched to the period the subsidy runs for, stated by interviewee 7. This in most cases means the investment will have a longer accepted payback period than a non-sustainable comparable investment, which means a higher accepted cost. Interviewees 6, 7, 15 and 19 stated they accept a longer payback period in case of a sustainable investment, thereby accepting a higher cost for the investment.

Interviewees 11, 12, 17 and 18 reported on investments that were certainly never going to be profitable as such, but were made, or were probably going to be made, either way. Interviewee 12 reported on an investment in a Greenfield in which, among other things, plants and crops were grown and rainwater was caught. Another was a highly expensive new installation that mainly improved sustainability performance but was financially not interesting at all (interviewee 11). Interviewees 17 and 18 reported on a speculative R&D investment which would, even if it succeeded, result in higher operating costs compared to current operating costs. These are all examples of investments that were clearly only in the interest of improving environmental sustainability performance or the environmental sustainability outlook of the firm, but were not financially interesting, thereby suggesting they were done out of intrinsic motivation mostly.

A final interesting finding in this regard was the notion that the longer the amortization period of the investment, the larger the accepted cost difference between the sustainable and non-sustainable option would be. Interviewees 10, 14, 17/18 and 19 confirmed this to generally hold in their firm. An example of this would be the investment in new company vehicles versus the investment in a new company building or roof of a building. Whereas the company vehicles will be written off in about four years, the new building or roof will be written off in twenty years or longer. This means the firm will be able to make the same decision again, whether to invest in an environmentally sustainable or non-sustainable way, in either four or twenty years. For the

investment with the short amortization period therefore only a minor cost increase for the sustainable option would be acceptable, whereas for the investment with the long amortization period a substantial difference would be accepted. Part of the reason for this was uncertainty concerning precise future regulations, but a general tendency of regulation in recent years to only become stricter in this regard. Therefore, investments with longer amortization periods are more prone to be confronted with more stringent regulation within the amortization period, thereby preemptively encouraging an environmentally sustainable investment.

Generally, sustainability is stated to play a more significant role in investment decisions now compared to some years ago. Furthermore, multiple interviews (12 and 14) stated the following: the smaller the investment, the larger the accepted cost difference for the sustainable investment compared to the regular investment. Others made comparable implicit statements and therefore this is a valid extra insight.

When asked for the importance given to sustainability in the decision-making process in numbers, firms with local governments as their clients tended to attribute more importance to sustainability than private firms. Finally, regarding this proposition, based on the interviews, web research and the published (sustainability) reports the firms that seemed to be most dedicated to sustainability in these three outings stated or showed sustainability was allowed to come at a significant cost. This seems to be mostly attributable to the degree of intrinsic motivation and thus environmental managerial concern. This fits findings by Cuerva et al. (2014), Bossle et al. (2016), Qi et al. (2010) and Chang and Chen (2013) all stating environmental managerial concern is crucial for adoption of eco-innovation and thus the likelihood environmental sustainability investments. These most dedicated firms were all private firms. This is remarkable and may be explained by a comment that was raised multiple times by the firms with governments as their clients: they know they use taxpayers' money and feel a strong need to be prudent.

4.3.4 Other insights

Some firms gave specific figures with regards to the importance of sustainability compared to profitability and other factors. Interviewee 7 stated profitability and environmental sustainability improvement were equally important for environmental sustainability investments. Interviewee 12 gave a ratio of 70% profitability against 30% sustainability improvement. The firm of interviewee 5 had a more thorough method of analysis in this regard. They execute a multi-criteria analysis for

each environmental sustainability investment in which CO₂ emission reductions count for 30%, recovery of raw materials counts for 15%, continuity of the firm counts for 25%, and the other 30% is split across price and the extent to which the investment is future proof or makes the operations more future proof. This adds up to around 45% for environmental sustainability-related factors, continuity is related to both profitability and sustainability, for sustainability is more and more a requirement for this firm. This again suggests at least half of the decision is determined by sustainability-related factors.

One more interesting remark made by one of the interviewees (17) was that contributing to a sustainable world is their mission, and profitability should be seen as a tool to enable that mission. This remark fits with the claims made by some other firms with regards to sustainability being in their DNA. Most firms however did state in the end the goal of the firm is to turn a profit, suggesting a different final goal.

4.3.5 Concluding remarks on proposition 3

Concluding, this study indicates intrinsic motivation to be relevant in considering sustainability investments and the degree to which it is allowed to come at a financial cost. All interviewees stated intrinsic motivation was one of the factors at play regarding the environmental sustainability investment. Intrinsic motivation is easy to claim yet hard to verify. Their care for sustainability was however corroborated in the online outings, published reports and the interviews. The firms that conveyed the most dedication were also those that have shown to bear the greatest costs for improving sustainability performance. Therefore, based on this research this proposition is not rejected. Actually confirming this proposition is difficult, as intrinsic motivation is hard to measure in qualitative research in an objective manner. Findings for this proposition are relevant more broadly where qualitative factors and subjective perceptions are concerned in business decisions, as is found more broadly in literature (Shah et al., 2021; Zahera and Bansal, 2018). Not only financial indicators seem to be relevant in business decisions based on this research.

4.4 Proposition 4: engaging in environmental sustainability reporting makes firms more prone to apply for environmental sustainability investment subsidies.

The final proposition concerns the possibility for environmental sustainability reporting to lead to application for environmental sustainability subsidies. This was only observed in one case (interviewee 6). This is a small private firm which had invested in a new production machine. Around the time of the increase in energy prices they were also setting up their sustainability programme and became interested in the effects this machine would have on their sustainability programme as well as their energy costs. This led to the discovery that the machine was significantly more energy-efficient and thereby fitted well with their sustainability program. They consulted the supplier of this machine and as a result found out the investment should be eligible for an environmental sustainability tax break. This was the only case where sustainability reporting contributed to the process of applying for a subsidy or tax break. This suggests this course of events does not take place often. Therefore, this proposition can be rejected in the sense that the evidence from the conducted interviews does not corroborate it. No literature was found to substantiate this claim either, therefore this conclusion is not surprising. There are many triggers for applying for investment subsidies, but the mere act of engaging in environmental sustainability reporting does not seem to be a salient one based on this research.

5. Discussion & limitations

This chapter will discuss a set of limitations of this research as well as other findings not discussed previously. First, generalizability of the conclusions is discussed, specifically subjectivity of interviewees, quality criteria, selection bias, variety of firms and the number of interviewees are considered. These are crucial matters when engaging in qualitative research and therefore need to be addressed. Next, interesting matters that came up during data analysis are discussed. One aspect discussed is whether the different types of firms studied perform differently regarding the propositions. And if so, why? The other concerns the cause of the ineffectiveness of GSAs. Next, other factors at play in the investments which came up in the literature review are discussed which were not part of the propositions. Finally, other minor findings are discussed.

5.1 Subjectivity of interviewees

Inherent to qualitative research using interviews as a research method is subjectivity of the interviewees. Possibly, other employees of the same firm may have answered differently to the questions posed and given a different perspective. Most interviewees were either part of the finance department of their firm, whereas some were more involved in the technical and operations side of the firm, or even the sustainability department of the firm. Some of the financial department-interviewees tended to focus more on the financial feasibility of investments, whereas those more often involved in the sustainability matters of the firm emphasized this aspect less, instead focusing more on the intrinsic value of sustainability as part of the investment. All in all, however, based on the interviews and the documentation reviewed, no strong contradictions were found in this regard. Subjectivity in this sense seems not to have influenced the findings significantly. This matches expectations based on the positivist paradigm adopted for the interviews.

5.2 Quality criteria of this study

The main issue to discuss concerns generalizability of findings. Several robustness procedures were implemented in this study to ensure a maximum amount of transferability, validity, generalizability, and reliability. Ali & Yusof (2011) state internal validity, external validity, reliability, and objectivity are the main criteria employed to test the quality of qualitative research. Internal validity concerns the degree to which results can be attributed to treatment. Since the main employed method here was interviewing, no issue is posed here as the results were gathered from the conducted interviews and corroborated with other documentation. External validity concerns generalizability, also called transferability, of results, which will be discussed below. Reliability concerns the extent to which findings can be replicated. This depends on the truthfulness and consistency of answers given by interviewees. The execution of this research has given no reason to doubt reliability of answers given. The last criterium is objectivity, which concerns the extent to which findings are free from bias. As the interviews were conducted in a positivist manner, questions were posed that gave as little possibility for interpretation as possible, reducing the possibility of bias impacting the results.

5.3 Generalizability of findings: Selection bias

One important aspect of generalizability is sampling. Leung (2015) states for optimal generalizability, systematic sampling should be adopted. Furthermore, triangulation and constant comparison should be exercised. Whereas the latter two were dealt with in this research, the former is an issue that should be discussed. Systematic sampling was not possible to the extent preferred. Invitations for cooperation were sent out systematically, but actual cooperation depends on willingness of respondents. For this research, nineteen interviews were conducted, whereas 127 firms were contacted. Table 1 provides an overview of the different sectors contacted and the interviews conducted with firms in these sectors (See Appendix 2).

Only around fifteen percent of firms contacted were willing to participate in this study. Many firms which rejected the proposal, if they sent a response, indicated they had no time to participate in this study, even after being told participation would not take more than an hour at most, and minimally half an hour. We should assume most people in business have busy schedules, otherwise the firm would have saved on labour expenses by employing less people. There is no reason to assume the firms that did participate are in this regard different from other firms. A logical explanation then is that a selection bias was at work, with people more interested in the topic of this research being more willing to participate in the study. This suggests the results of this study may not be representative of every firm in the Netherlands, but only for firms with employees and managers interested in the topic of this research. Since each interviewee indicated intrinsic motivation for improving sustainability performance of the firm was a factor in the investment decision, the sample indeed seems to be skewed towards respondents with above-average interest in sustainability. Requests for participation in a similar study by a more authoritative body such as a government ministry or RVO may result in a more diverse sample. This solution was not possible in the timeframe of this research.

5.4 Robustness of findings: number of interviews

Based on the literature (Guest et al., 2006; Malterud et al., 2015), nineteen interviews should be more than enough to be able to draw conclusions for qualitative research. Guest et al. (2006) find for nonprobabilistic interviews that ‘saturation’ takes place at around twelve interviews, meaning no more new themes arise in the following interviews, this would suggest the sample in this study is large enough to draw conclusions. Kuzel (1992) suggests homogenous samples

require about six to eight interviews and heterogeneous samples require between ten and twenty interviews, which are useful when attempting to achieve maximum variation. On the one hand, this sample is homogenous as these firms all seem to be intrinsically motivated and interested in sustainability. On the other hand, the firms are of differing sizes and sectors, thereby increasing heterogeneity. Nineteen interviews, based on Kuzel (1992) should be enough given the homogenous and heterogeneous elements in the sample to draw conclusions. To truly be well able to draw conclusions for each individual group of firms, both split by sector and by size, larger samples are imperative, especially for listed firms. Furthermore, in comparable research similar numbers of interviews are held. McCluskey et al. (2010) who use semi-structured interviews too have a sample of sixteen and Akimowicz et al. (2016) have a sample of 24 in total including three experts. In this study one participant was an expert, the rest were regular interviewees. A longer research time frame and a more authoritative body making participation requests should aid in resolving the issue of generalizability based on number of interviewees.

5.5 Generalizability of findings: variety in sectors and types of firms

Spencer et al. (2003) split generalizability into representational generalization, analytical or theoretical generalization and empirical or inferential generalization. These will now shortly be discussed in turn, after which they will be applied to this study.

Theoretical generalization regards generalization based on theoretical analysis of the factors producing the observed outcomes and is strengthened when underlying theory is present, the findings support theory and multiple cases support the underlying theory (Yin, 2010). In this study no theoretical generalization takes place, as this study focuses on environmental sustainability investments in Dutch firms. No claims are made outside of this framework and in this sense, theory is not further developed.

Representational generalization can be done if the findings can be applied to a population outside the subject, but with similar characteristics. Inferential or empirical generalizability concerns the degree to which findings can be applied to settings outside the study, so whether they can be transferred to a similar but different setting. This depends on the contextual depth of the cases in the study, with more contextual depth making generalization more difficult. Ideally, empirical generalizability gives way to theoretical generalizability through the use of underlying theory (Ehrenberg, 1995). Inferential representability is closely related to representational

generalizability, the difference between the two being on the population chosen to generalize to. Ideally, the findings would be generalizable to the full population of Dutch firms. Limitations discussed below, however, show this not to be the case. A smaller population should be used, namely firms with employees and managers willing to contribute to sustainability performance. The findings in this study are thus representationally generalized to this smaller population.

Inferential generalizability can be deemed an issue in this study. As discussed above, the respondents cannot be assumed to form an unbiased sample representative of all Dutch firms. The question remains to which population the findings can be generalized and to what populations outside this population the findings can be generalized.

Multiple aspects of the sample limiting representational generalizability will now be discussed: type of firm, sector of firm and size of firm. Some variety was noticeable in the responses to the questions posed in the interviews. Firms active for local governments recurrently mentioned two aspects with respect to the factors at play in considering environmental sustainability investments: first, they must be financially prudent as they are spending taxpayers' money in their projects, this limits the degree to which they can engage in expensive sustainability-driven investments; second, the local government that contracted their services and products wishes to work with sustainable services and products. These are countervailing forces for firms working for local governments. Similar forces are at play in private firms, both wanting to turn a profit and therefore to invest in the economically most attractive options, but also the intrinsic motivation for sustainability as well as the conviction that sustainability improves reputation, or the firm is indeed pressured by stakeholders including clients to operate more sustainably. The origins of these forces are different, but they are at play in both private and government-tied firms, therefore this difference does not seem to pose a hurdle to generalizability of findings.

Literature indicates firm size may matter for the motivations of firms to invest in environmental sustainability performance (Bossle et al., 2016; Qi et al., 2010). The size of a firm in this study is found mainly to matter for the first proposition, concerning the effect of environmental sustainability reporting on the awareness of environmental sustainability investment opportunities. The process by which this can take place tends to be more copious as firms grow in size, as the departments responsible for these two aspects of operations are further apart in the firm, thereby making the interaction between relevant employees necessary for this process to take place less likely. Furthermore, the two firms with the most engineers, which were also the largest firms,

indicated they did not expect to identify many new opportunities for environmental sustainability performance as their engineers had already done this in the past as part of efficiency improvements. This suggests findings should be split according to size of the firm, with indicative evidence for the first proposition holding more strongly for small firms.

Furthermore, as Table 1 shows, two sectors, furniture production and waste processing & collection, are overrepresented in the sample. This suggests the results may be more specifically valid for these sectors. Some differences based on sector can be noted. As noted, the firms with local governments as clients, these were all waste processing & collection firms, showed a different underlying motivation with respect to private firms for investing in environmental sustainability performance. The outcome, however, was the same as for other firms, so sector does not seem to have influenced the results in that regard. Waste processing & collection firms were notably more active for a longer period already in gathering data on environmental sustainability performance. This influences the degree to which they will be affected by upcoming environmental sustainability reporting regulation but does not affect the process studied here.

Viewed in full, findings regarding the second, third and fourth proposition can be deemed generalizable for all firms with a predisposition towards environmental sustainability. Findings for the first proposition are less generalizable. Where the cut-off in firm size lies for the proposition to hold can be a topic of further research. As stated before, the sample can be deemed skewed towards firms concerned with environmental sustainability, therefore the findings can only be representationally generalized to that limited population. More time to conduct research should and requests for participation from a more authoritative body should aid in resolving this issue too, allowing for a better focus on specific sectors while having sufficient respondents to draw authoritative conclusions.

5.6 Effectiveness of GSAs: may depend on size of the tax break given

In chapter four GSAs were discussed and determined not to make firms more prone to engage in environmental sustainability investments. This contradicts the findings of Czarnitzki et al. (2011) and Peng & Liu (2018), which conclude GSAs can indeed be effective at incentivising investment. A variety of factors can be responsible for this lack of effect, however. First, the size of the tax breaks discussed may simply be too small, and therefore irrelevant in the eyes of the firm. This was stated as the reason this tax break played a significant role in the investment decision

process in interviews 1, 5, 8, 10, 12, 13 and 15. This would suggest the instrument as such is not ineffective, but the MIA and EIA employed by the Dutch government are currently simply too meagre in size to sort any real effect. The business cases reviewed show the tax breaks amount to around ten percent of the total investment cost. Perhaps if the size of the tax break would increase, the instrument may be more effective. A second reason for ineffectiveness, which came up during the interviews, is that firms only found out about the existence of the tax break once the investment decision has been made (interviews 4 and 6). This suggests a more fundamental problem with GSAs regarding their potential effectiveness. Another reason given for not attributing much value to GSAs is lack of clarity concerning the precise size of the benefits and the requirements the firm has to comply with to actually receive these benefits, this however is an issue that can be at play for the other subsidies too. What matters here may be the size of the investment. Firms indicated they made sure to find out whether subsidies were available for large investments, as a source of financing, however for small investments they were less prone to do this. Then again, if the size of the tax break were larger, this may change the behaviour of firms in this regard. Therefore, the true effectiveness of GSAs cannot be determined yet. More research should be done into effectiveness of different forms of GSAs with different monetary sizes to be able to conclusively answer the question of their effectiveness in this regard.

5.7 Other factors at play

Interviewees were asked which factors were at play in the decision to invest in improving their environmental sustainability performance. These factors will now be touched upon and linked to the factors identified in the literature.

One set of motivations given to invest in environmental sustainability performance is pressure or requests from stakeholders to act sustainably. Out of sixteen relevant firms nine mentioned different forms of stakeholder pressure as a motivation for environmental sustainability investments. The stakeholders mentioned here were employees, clients, governments through tenders and the bank. They are not obliged to budge to this pressure, but nonetheless feel the need to act upon it. This suggests they share the view of these stakeholders and are indeed concerned for the environmental performance of their firm. Clearly, the interviewees were split on this issue, as is the literature. Qi et al. (2010) find stakeholder pressure not to be a significant driver of environmental sustainability investments, whereas Chen et al. (2018), Berrone et al. (2013) and

Bossle et al. (2016) do. Interviewees 8 and 13 stated employees wish to improve sustainability performance of the firm and therefore pressure managers to invest in environmental sustainability performance. Interviewees 17 and 19 state they feel pressure from clients to improve their environmental sustainability performance, the subsidy advisory firm (interviewee 4) also stated this is one of the main motivations for sustainability investments among their clients. Four firms (interviewees 5, 12, 15 and 17) stated (government) tenders have been a reason to improve sustainability performance and invest in environmental sustainability. One of these firms even stated their path towards sustainability had begun due to increasing requests for high environmental sustainability performance in tenders. Finally, one firm (interview 8) stated the bank pressures the firm to act sustainably, for that enables the bank to state they increasingly finance only sustainable operations and firms. A related case has been touched upon before (interview 18), where a large firm made an arrangement with their bank in which they borrowed against lower interest rates if certain sustainability metrics were achieved, this can also be seen as an incentive and a form of pressure from the bank.

Competitive pressure is identified as a relevant factor in literature. Six interviewees (1, 2, 6, 14, 16 and 19) claimed an important factor was to keep up with their industry peers in terms of technological progress. To gain experience with a new technique that would undoubtedly become more relevant in the future was a factor named by one of the interviewees. Two other firms (interviews 1 and 17/18) indicated they were in an exploratory project to gain experience with a new technique, where the sole purpose was to try out this new technique and see what the opportunities were regarding that technique. Furthermore, eight firms (interviews 3, 5, 6, 12, 15, 16, 17/18 and 19) stated the investment would generally bring about a technological improvement of operations, it would be more efficient or capable and at the same time (or even because of this) be more sustainable.

Energy and material prices are named in the literature as relevant motivations for environmental sustainability investments. This is corroborated in this study as eight firms (interviews 2, 5, 8, 10, 12, 13, 15 and 19) stated high energy prices and the wish to be (more) energy independent as a motivation for investing. Four of these firms (5, 8, 12 and 15) moreover wished to be able to use their self-generated green energy more optimally.

Literature is inconclusive when it comes to future and upcoming regulation as a motivation for environmental sustainability investments, Triguero et al. (2013) find future regulation does not

contribute to willingness to innovate, whereas Bitat (2017) finds the opposite. This was reflected in the findings in this study. Interviewees 3, 5, 10, 13, 16, 17/18 and 19 indicated future regulation was a motivation for investing. Interviewees 3, 16 and 19 indicated future regulation to be too uncertain and therefore not something they could consider. An important distinction made by interviewees 3 and 16 in this regard was between regulation that has been published but is not yet active, versus potential future regulation in general. The former is something these firms do take into account. The latter is found more challenging to deal with, even though multiple interviewees indicated they were certain particular emission or energy-efficiency norms will only become more stringent, and therefore did take this into account even though no specific regulation with this content has been passed yet. Lack of regulation can also be a hurdle for firms. Interviewees 15 and 17 indicated their firms experienced difficulties due to their technology being more advanced than the level of technology regulators had considered up until then and regulated for. This causes uncertainty which holds back firms from investing further in a new technology. Related to this, three interviewees (4, 5, 11) indicated it is important for the government to be clear and adamant in their messaging and strategy regarding sustainability. An unclear course or one that changes multiple times in a relatively short period is highly troubling for firms as this gives them no certainty as to whether they can keep using their investment and thus whether it will generate the expected returns. A clear strategy provides firms certainty and makes them more prone to invest in environmental sustainability performance. In case of large investments political and societal support may be crucial, as one interviewee indicated: their firm stopped the investment procedure for a biomass processing facility when societal and political support for biomass fell. This reduction of support led to more stringent safety standards, which made the investment financially significantly less attractive. A similar experience was shared by interviewee 16, who indicated solar panels turned out not to be an interesting investment proposition due to the necessary additional investments in constructional safety required by the insurance company.

Interviewees 7 and 11 specifically stated it is important that risks are covered to a large enough extent, if necessary by the government. Risk is named in the literature as one of the internal factors relevant for environmental sustainability investment decisions. Furthermore, as interviewee 7 stated, a higher risk should be paired with a higher return on investment. Regarding regulation, interviewee 10 stated their firm was forced to improve their environmental sustainability performance due to the Energy Efficiency Directive (EED, Directive 2012/27/EU, 2012). Other

firms mentioned this Directive too but did not name it as a strong motivator to invest. Finally, related to government regulations, interviewee 5 stated a reduced need for environmental permits as a motivating factor to invest. Interviewees 11, 14 and 15 others stated the prospect of lower current or future environmental taxes (specifically CO₂ taxes) as a motivating factor to invest in their environmental sustainability performance. This fits with the factor fiscal incentives, identified in the literature as part of normative pressure.

Interviewees 3, 15, 17 and 19 stated environmental sustainability investments are in some cases made less attractive due to practical complications encountered during operations with the new technology. This strokes with the factor identified in the literature as technological capacity. Although that factor may be split in technological capacity of the firm and the level of progress of a new technology. Literature often refers to the former, whereas three out of four interviewees here alluded to the latter (15, 17 and 19).

Investments can be attractive for firms if they can ask a higher price for sustainable products, interviewees 1, 4, 13, 15 and 17 indicated this to be a motivating factor for environmental sustainability investments. Next, interviewees 3, 6, 14, 15, 16 and 19 indicated the investment led to lower operating costs and was therefore directly financially interesting compared to a non-sustainable investment option. Finally, interviewees 15 and 18 indicated their bank provided green financing opportunities, thereby incentivising environmental sustainability investments through cheaper credit.

In many cases sustainable products or services are more expensive. A firm can choose whether to pay a green premium itself by investing in a new technology which is still expensive and possibly not fully proven, or it may wait until the technology has proven itself and has become less expensive. This consideration can delay an environmental sustainability investment, as indicated by one interviewee. Whether the firm is willing to make an environmental sustainability investment therefore may depend on whether their clients are willing to pay a so-called green premium. Interviewees 9 and 17 named this as a relevant factor in considering environmental sustainability investments. Another issue encountered by firms (interviewees 10 and 12) when considering such an investment is whether stakeholders such as employees can be convinced of the necessity, and whether suppliers are able to supply the necessary products (this mainly counts for use of new sustainable materials or production processes) (interviewee 10). Both these factors may slow the execution of environmental sustainability investments.

Environmentally sustainable investments can also provide safety improvements as a result of a use of a different technology or operational setup, as indicated by interviewee 5. This may be another reason to make the investment. This motivation is not related to environmental sustainability but to social sustainability. These two are often linked, both by firms and the CSRD.

5.8 Other findings

Concluding this chapter, some interesting comments made in the interviews should be noted. First, interviewees 8, 9 and 19 brought up the logical issue that the return on investment for solar panels and other renewable energy sources tends to go down as the size of the investment increases. This logically follows from the fact that in most cases the sun does not shine, or the wind does not blow, or shines or blows only a little. This means to cover the energy needs of the firm for as large a part of the time as possible, a large investment is necessary. On the other hand, this means if the sun does shine strongly or the wind does blow hard a much larger amount of electricity is generated than can be used by the firm, making the investment inefficient in that regard.

Second, one firm highly motivated in the realm of sustainability (interviewee 10) indicated they actually hoped regulation would become more stringent, as they now sometimes experienced disadvantages as a result of the extent to which they were ahead of their competitors in the realm of sustainability. This fits with claims made by two other firms mentioning lack of clear regulation as a hurdle for investment (interviewees 14 and 17/18).

Third, interviewee 19 stated that even though the manager is truly convinced of the notion that sustainability is the only way forward and therefore a certain environmental sustainability investment should be made, commercial and financial arguments are always more useful in convincing others. This should not come as a surprise but may feel improper to those truly convinced of their cause. Therefore, it is good to be reminded of this fact.

Finally, an interesting contradiction arose in the comments made on subsidies. Some interviewees (5, 7, 16), indicated they always look for subsidies and use them in the business case, other interviewees (5, 8, 12, 16) stated they wished not to rely on subsidies as they may not always provide the funding expected beforehand.

6. Conclusion, policy recommendations and avenues for further research

International agreements such as the Kyoto Protocol and Paris Climate Agreement have put the spotlight on the necessary transition to an environmentally sustainable society and economy. This transition is made by governments, firms, and people individually. At multiple layers of government, both local, regional, national, and supranational policies have been adopted to steer people and firms towards realising this transition. This thesis has focused on an important aspect of this transition: environmental sustainability investments. Specifically, this thesis has studied the impact of two different types of policy options employed by national and supranational governments in the realm of environmental sustainability policy. First, the effect of environmental sustainability reporting regulation on environmental sustainability investment decisions is studied. Second, the effect of tax breaks, subsidies, and grants on the willingness to make environmental sustainability investments. Furthermore, other relevant factors in environmental sustainability investment decisions were enquired upon and were compared to findings in the literature. Through interviews, document analysis and website analysis, eighteen firms were studied to find an answer to the following research question: How do environmental sustainability reporting regulation and environmental sustainability investment subsidies in the EU and the Netherlands influence firms' environmental sustainability investment decisions?

Literature is generally inconclusive regarding both parts of this research question. One specific factor identified in the literature to be highly relevant in this case is environmental managerial concern. This factor was therefore added to the propositions resulting from the research question, resulting in four final propositions to be studied:

1. *Proposition 1: engaging in environmental sustainability reporting increases the awareness of possibilities for investing in environmental sustainability performance.*
2. *Proposition 2: availability of subsidies increases the willingness to invest in environmental sustainability performance.*
3. *Proposition 3: environmental managerial concern is essential for the willingness to invest in environmental sustainability performance and the degree to which it is allowed to come at a short-term financial cost.*

4. *Proposition 4: engaging in environmental sustainability reporting makes firms more prone to apply for environmental sustainability investment subsidies.*

This study made use of interviews backed up with relevant documents, including business cases and annual (sustainability) reports as well as websites of the studied firms. A positivist paradigm was the basis of this study. Through a positivist interview guide, information was gathered to draw conclusions based on the formulated propositions. Analysis indicates the first proposition to partly hold in practice, with a distinction present based on firm size. Environmental reporting regulation forces firms both to gather information and formulate environmental goals. The latter seems to be effective in all firms at increasing awareness of possible environmental sustainability investments, whereas the former is generally less effective in larger firms due to organisational distance between relevant departments in the firm. A further interesting finding adding to literature is that client demands for environmental sustainability investments can also arise from the clients' environmental sustainability reporting requirements. Analysis further indicates the second proposition to hold partially too, with a distinction in types of subsidies present. Tax breaks, or GSAs are deemed ineffective at incentivising environmental sustainability investments, whereas subsidies and grants are deemed effective. Research grants gained awarded to consortiums are mainly effective due to the cooperation in the consortium. Third, this study indicates environmental managerial concern indeed to be important for both the willingness to invest in environmental sustainability performance and the degree to which it is allowed to come at a short-term financial cost. Managers more convinced of their environmental sustainability targets are more willing to accept corresponding costs. Finally, no evidence is found for the fourth proposition, engaging in environmental sustainability reporting is not found to lead to more applications for environmental sustainability investment subsidies or tax breaks. Due to the present distinctions within the sample and the therefore relatively small subsamples these results should for now be viewed as indicative. Further research should be done with larger samples for each sector and size-type of firm.

Based on the conducted research, several policy recommendations can be made. First, current tax breaks that aim to incentivize environmental sustainability investments are found to be inefficient. Firms state these tax breaks not to make a difference in their investment decision. The reason most often given for this was that the size of the tax break was insufficient to be relevant.

Therefore, for this policy instrument to be more relevant, the size of the tax break should increase. This recommendation can be implemented more broadly. Each financial incentive, also outside investment incentives, can be assumed to have a lower bound below which it is not effective. The specific height of that boundary may differ per context and instrument and should be identified for policy to be efficient. Therefore, researchers in other fields of study should look into this issue too. Second, environmental sustainability reporting regulations should include setting up quantitative metrics for environmental sustainability performance improvements. Gathering information in this regard is already effective at creating awareness necessary in most firms to steer them towards environmental sustainability investments. The extra step of formulating quantitative targets, however, is found to be even more effective towards this goal. Third, governments can incentivize firms much more to make environmental sustainability investments. They should take away as much uncertainty as possible by providing a clear course of action and make clear statements concerning the broader aim of sustainability-related policies. This includes clarity on upcoming regulation, which should be adjusted as little as possible once announced. Government tenders should reward high environmental sustainability performance more through a mark-up for an environmentally sustainable execution of the task. Last, governments should provide more possibilities for quick and simple permit procedures for testing or applying new technologies to spur the use of these technologies and consequent investments.

Two avenues for further research have finally been identified. First, whether merely gathering information on environmental sustainability performance leads to newly identified investment opportunities seems to depend on the size of the firm. Further research could study whether this is indeed the case. Possibly an upper bound exists for firm size above which the necessary interchange between employees for this process to take place does no longer take practice as these employees are not in contact with one another anymore due to organizational distance. Second, this research takes place as CSRD is being implemented. Even though its implementation was part of the motivation of this research, its effects can only be studied in the future, after full implementation has taken place. Therefore, a similar study should take place in five years or even further into the future to draw conclusions on its effects in the realm of environmental sustainability investments.

Bibliography

- Agan, Y., Acar, M. F., & Borodin, A. (2013). Drivers of environmental processes and their impact on performance: A study of Turkish SMEs. *Journal of Cleaner Production*, 51, 23–33.
<https://doi.org/10.1016/j.jclepro.2012.12.043>
- Akimowicz, M., Cummings, H., & Landman, K. (2016). Green lights in the Greenbelt? A qualitative analysis of farm investment decision-making in peri-urban Southern Ontario. *Land Use Policy*, 55, 24–36. <https://doi.org/10.1016/j.landusepol.2016.03.024>
- Ali, A., & Yusof, H. (2011). Quality in Qualitative Studies: The Case of Validity, Reliability and Generalisability. *Issues in Social and Environmental Accounting*, 5(1/2), 25–64.
- Astedt-Kurki, P., & Heikkinen, R.-L. (1994). Two approaches to the study of experiences of health and old age: The thematic interview and the narrative method. *Journal of Advanced Nursing*, 20(3), 418–421. <https://doi.org/10.1111/j.1365-2648.1994.tb02375.x>
- Bansal, P., & Roth, K. (2000). WHY COMPANIES GO GREEN: A MODEL OF ECOLOGICAL RESPONSIVENESS. *Academy of Management Journal*, 43(4), 717–736.
<https://doi.org/10.2307/1556363>
- Bitat, A. (2018). Environmental regulation and eco-innovation: The Porter hypothesis refined. *Eurasian Business Review*, 8(3), 299–321. <https://doi.org/10.1007/s40821-017-0084-6>
- Bleijenbergh, I. (2015). *Kwalitatief onderzoek in organisaties (2e druk)*. Den Haag: Boom Lemma Uitgevers.
- Bossle, M. B., Dutra de Barcellos, M., Vieira, L. M., & Sauvée, L. (2016). The drivers for adoption of eco-innovation. *Journal of Cleaner Production*, 113, 861–872.
<https://doi.org/10.1016/j.jclepro.2015.11.033>

- Brouillat, E., & Oltra, V. (2012). Extended producer responsibility instruments and innovation in eco-design: An exploration through a simulation model. *Ecological Economics*, 83, 236–245. <https://doi.org/10.1016/j.ecolecon.2012.07.007>
- Brunnermeier, S. B., & Cohen, M. A. (2003). Determinants of environmental innovation in US manufacturing industries. *Journal of Environmental Economics and Management*, 45(2), 278–293. [https://doi.org/10.1016/S0095-0696\(02\)00058-X](https://doi.org/10.1016/S0095-0696(02)00058-X)
- Cai, W., & Li, G. (2018). The drivers of eco-innovation and its impact on performance: Evidence from China. *Journal of Cleaner Production*, 176, 110–118. <https://doi.org/10.1016/j.jclepro.2017.12.109>
- Caputo, F., Pizzi, S., Ligorio, L., & Leopizzi, R. (2021). Enhancing environmental information transparency through corporate social responsibility reporting regulation. *Business Strategy and the Environment*, 30(8), 3470–3484. <https://doi.org/10.1002/bse.2814>
- Chang, C., & Chen, Y. (2013). Green organizational identity and green innovation. *Management Decision*, 51(5), 1056–1070. <https://doi.org/10.1108/MD-09-2011-0314>
- Chen, X., Yi, N., Zhang, L., & Li, D. (2018). Does institutional pressure foster corporate green innovation? Evidence from China's top 100 companies. *Journal of Cleaner Production*, 188, 304–311. <https://doi.org/10.1016/j.jclepro.2018.03.257>
- Chenail, R. J. (2011). Interviewing the investigator: Strategies for addressing instrumentation and researcher bias concerns in qualitative research. *Qualitative Report*, 16(1), 255–262.
- Cridland, E. K., Jones, S. C., Caputi, P., & Magee, C. A. (2015). Qualitative research with families living with autism spectrum disorder: Recommendations for conducting semistructured interviews. *Journal of Intellectual and Developmental Disability*, 40(1), 78–91. <https://doi.org/10.3109/13668250.2014.964191>

- Cubas-Díaz, M., & Martínez Sedano, M. Á. (2018). Measures for Sustainable Investment Decisions and Business Strategy – A Triple Bottom Line Approach. *Business Strategy and the Environment*, 27(1), 16–38. <https://doi.org/10.1002/bse.1980>
- Cucchiella, F., Condemi, A., Rotilio, M., & Annibaldi, V. (2021). Energy Transitions in Western European Countries: Regulation Comparative Analysis. *Energies*, 14(13), 3940. <https://doi.org/10.3390/en14133940>
- Cuerva, M. C., Triguero-Cano, Á., & Córcoles, D. (2014). Drivers of green and non-green innovation: Empirical evidence in Low-Tech SMEs. *Journal of Cleaner Production*, 68, 104–113. <https://doi.org/10.1016/j.jclepro.2013.10.049>
- Czarnitzki, D., Hanel, P., & Rosa, J. M. (2011). Evaluating the impact of R&D tax credits on innovation: A microeconomic study on Canadian firms. *Research Policy*, 40(2), 217–229. <https://doi.org/10.1016/j.respol.2010.09.017>
- Dacin, M. T. (1997). Isomorphism in context: Power and Prescription of Institutional Norms. *Academy of Management Journal*, 40(1), 46–81. <https://doi.org/10.2307/257020>
- Daddi, T., Testa, F., Frey, M., & Iraldo, F. (2016). Exploring the link between institutional pressures and environmental management systems effectiveness: An empirical study. *Journal of Environmental Management*, 183, 647–656. <https://doi.org/10.1016/j.jenvman.2016.09.025>
- de Jonge, A. (2015). Study 2. In *The Glass Ceiling in Chinese and Indian Boardrooms* (pp. 119–138). Elsevier. <https://doi.org/10.1016/B978-1-84334-617-3.00007-7>
- De Marchi, V. (2012). Environmental innovation and R&D cooperation: Empirical evidence from Spanish manufacturing firms. *Research Policy*, 41(3), 614–623. <https://doi.org/10.1016/j.respol.2011.10.002>

- de Vries, F. P., & Withagen, C. A. M. (2005). Innovation and Environmental Stringency: The Case of Sulfur Dioxide Abatement. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.670158>
- Dearnley, C. (2005). A reflection on the use of semi-structured interviews. *Nurse Researcher*, *13*(1), 19–28. <https://doi.org/10.7748/nr2005.07.13.1.19.c5997>
- Deephouse, D. L. (1997). Part IV: How Do Reputations Affect Corporate Performance?: The Effect of Financial and Media Reputations on Performance. *Corporate Reputation Review*, *1*(1), 68–72. <https://doi.org/10.1057/palgrave.crr.1540019>
- Denzin, N. K., & Lincoln, Y. S. (1994). *Handbook of qualitative research*. (pp. xii, 643). Sage Publications, Inc.
- Díaz-García, C., González-Moreno, Á., & Sáez-Martínez, F. J. (2015). Eco-innovation: Insights from a literature review. *Innovation*, *17*(1), 6–23. <https://doi.org/10.1080/14479338.2015.1011060>
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *The New Economic Sociology*, 111–134.
- DiMaggio, P. J., & Powell, W. W. (1991). Introduction. I: PJ DiMaggio & W. W. Powell. *The New Institutionalism in Organizational Analysis*, 1–38.
- Dixon-Woods, M., Shaw, R. L., Agarwal, S., & Smith, J. A. (2004). The problem of appraising qualitative research. *Quality and Safety in Health Care*, *13*(3), 223. <https://doi.org/10.1136/qshc.2003.008714>
- Doran, J. (2012). Are differing forms of innovation complements or substitutes? *European Journal of Innovation Management*, *15*(3), 351–371. <https://doi.org/10.1108/14601061211243675>
- Ehrenberg, A. S. C. (1995). Empirical Generalisations, Theory, and Method. *Marketing Science*, *14*(3), G20–G28. JSTOR.

Elkington, J. (1997). The triple bottom line. *Environmental Management: Readings and Cases*, 2, 49–66.

EURES. (2022, July 11). *Labour market information: Netherlands* [Labour market information].

https://eures.ec.europa.eu/living-and-working/labour-market-information/labour-market-information-netherlands_en

European Commission. (2020). *A European Green Deal*. European Commission.

https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#actions

European Commission. (2023). *Corporate Sustainability Reporting*.

https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

EED, Directive 2012/27/EU, no. Directive 2012/27/EU (2012). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012L0027>

NFRD, Directive 2014/95/EU, no. Directive 2014/95/EU, European Parliament and Council (2014).

CSRD, Directive 2022/2464/EU, no. Directive 2022/2464/EU, European Parliament and Council (2022).

Franceschini, S., Faria, L. G. D., & Jurowetzki, R. (2016). Unveiling scientific communities about

sustainability and innovation. A bibliometric journey around sustainable terms. *Journal of*

Cleaner Production, 127, 72–83. <https://doi.org/10.1016/j.jclepro.2016.03.142>

Fronzel, M., Horbach, J., & Rennings, K. (2007). End-of-pipe or cleaner production? An empirical

comparison of environmental innovation decisions across OECD countries. *Business Strategy*

and the Environment, 16(8), 571–584. <https://doi.org/10.1002/bse.496>

- Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. *Field Methods*, 18(1), 59–82.
<https://doi.org/10.1177/1525822X05279903>
- Hoffmann, V. H. (2007). EU ETS and Investment Decisions: *European Management Journal*, 25(6), 464–474. <https://doi.org/10.1016/j.emj.2007.07.008>
- Hopf, C. (2004). Qualitative interviews: An overview. *A Companion to Qualitative Research*, 203(8), 100093.
- Horbach, J. (2008). Determinants of environmental innovation—New evidence from German panel data sources. *Research Policy*, 37(1), 163–173. <https://doi.org/10.1016/j.respol.2007.08.006>
- Horbach, J., Oltra, V., & Belin, J. (2013). Determinants and Specificities of Eco-Innovations Compared to Other Innovations—An Econometric Analysis for the French and German Industry Based on the Community Innovation Survey. *Industry & Innovation*, 20(6), 523–543.
<https://doi.org/10.1080/13662716.2013.833375>
- Horbach, J., Rammer, C., & Rennings, K. (2012). Determinants of eco-innovations by type of environmental impact—The role of regulatory push/pull, technology push and market pull. *Ecological Economics*, 78, 112–122. <https://doi.org/10.1016/j.ecolecon.2012.04.005>
- Jaffe, A. B., Peterson, S. R., Portney, P. R., & Stavins, R. N. (1995a). Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us? *Journal of Economic Literature*, 33(1), 132–163. JSTOR.
- Jaffe, A. B., Peterson, S. R., Portney, P. R., & Stavins, R. N. (1995b). Environmental regulations and the competitiveness of US industry. *Illumina Technology Records-Unstructured*.

- Jaiyeoba, H. B., & Haron, R. (2016). A qualitative inquiry into the investment decision behaviour of the Malaysian stock market investors. *Qualitative Research in Financial Markets*, 8(3), 246–267. <https://doi.org/10.1108/QRFM-07-2015-0027>
- Jennings, P. D., & Zandbergen, P. A. (1995). Ecologically Sustainable Organizations: An Institutional Approach. *The Academy of Management Review*, 20(4), 1015. <https://doi.org/10.2307/258964>
- Jové-Llopis, E., & Segarra-Blasco, A. (2018). Eco-innovation strategies: A panel data analysis of Spanish manufacturing firms. *Business Strategy and the Environment*, 27(8), 1209–1220. <https://doi.org/10.1002/bse.2063>
- Kallio, H., Pietilä, A.-M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, 72(12), 2954–2965. <https://doi.org/10.1111/jan.13031>
- Kesidou, E., & Demirel, P. (2012). On the drivers of eco-innovations: Empirical evidence from the UK. *Research Policy*, 41(5), 862–870. <https://doi.org/10.1016/j.respol.2012.01.005>
- Krauss, S., Hamzah, A., Omar, Z., Suandi, T., Ismail, I., Zahari, M., & Nor, Z. (2014). Preliminary Investigation and Interview Guide Development for Studying how Malaysian Farmers Form their Mental Models of Farming. *The Qualitative Report*. <https://doi.org/10.46743/2160-3715/2009.1382>
- Kuzel, A. J. (1992). *Sampling in qualitative inquiry*.
- Lanoie, P., Patry, M., & Lajeunesse, R. (2008). Environmental regulation and productivity: Testing the porter hypothesis. *Journal of Productivity Analysis*, 30(2), 121–128. <https://doi.org/10.1007/s11123-008-0108-4>

- Leenders, M. A. A. M., & Chandra, Y. (2013). Antecedents and consequences of green innovation in the wine industry: The role of channel structure. *Technology Analysis & Strategic Management*, 25(2), 203–218. <https://doi.org/10.1080/09537325.2012.759203>
- Leung, L. (2015). Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care*, 4(3), 324. <https://doi.org/10.4103/2249-4863.161306>
- Li, D., & Ng, W.-L. (2000). Optimal Dynamic Portfolio Selection: Multiperiod Mean-Variance Formulation. *Mathematical Finance*, 10(3), 387–406. <https://doi.org/10.1111/1467-9965.00100>
- Louise Barriball, K., & While, A. (1994). Collecting data using a semi-structured interview: A discussion paper. *Journal of Advanced Nursing*, 19(2), 328–335. <https://doi.org/10.1111/j.1365-2648.1994.tb01088.x>
- Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample Size in Qualitative Interview Studies: Guided by Information Power. *Qualitative Health Research*, 26(13), 1753–1760. <https://doi.org/10.1177/1049732315617444>
- Mandal, P. (2018). Qualitative research: Criteria of evaluation. *International Journal of Academic Research and Development*, 3(2), 591–596.
- Markowitz, H. (1952). Portfolio Selection. *The Journal of Finance*, 7(1), 77–91. <https://doi.org/10.1111/j.1540-6261.1952.tb01525.x>
- Mateut, S. (2018). Subsidies, financial constraints and firm innovative activities in emerging economies. *Small Business Economics*, 50(1), 131–162. <https://doi.org/10.1007/s11187-017-9877-3>
- McCluskey, T., Broderick, A., Boyle, A., Burton, B., & Power, D. (2010). Evidence on Irish financial analysts' and fund managers' views about dividends. *Qualitative Research in Financial Markets*, 2(2), 80–99. <https://doi.org/10.1108/17554171080000381>

- Merton, R. C. (1969). Lifetime Portfolio Selection under Uncertainty: The Continuous-Time Case. *The Review of Economics and Statistics*, 51(3), 247. <https://doi.org/10.2307/1926560>
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83(2), 340–363.
- Mortelmans, D. (2018). *Handboek kwalitatieve onderzoeksmethoden* (2 ed). Acco.
- Oates, W. E., Palmer, K., & Portney, P. R. (1993). *Environmental regulation and international competitiveness: Thinking about the Porter hypothesis*. University of Maryland, Department of Economics.
- Palmer, K., & Simpson, R. D. (1993). Environmental Policy as Industrial Policy. *Resources*, 112, 17–21.
- Peng, H., & Liu, Y. (2018). How government subsidies promote the growth of entrepreneurial companies in clean energy industry: An empirical study in China. *Journal of Cleaner Production*, 188, 508–520. <https://doi.org/10.1016/j.jclepro.2018.03.126>
- Pereira, Á., & Vence, X. (2012). Factores empresariales clave para la eco-innovación: Una revisión de estudios empíricos recientes a nivel de empresa. *Cuadernos de Gestión*, 12(Esp), 73–103. <https://doi.org/10.5295/cdg.110308ap>
- Porter, M. E. (1991). America's Green Strategy. *Scientific American*, 264(4). <http://www.hbs.edu/faculty/product/6107>
- Porter, M. E., & Linde, C. van der. (1995). Toward a New Conception of the Environment-Competitiveness Relationship. *Journal of Economic Perspectives*, 9(4), 97–118. <https://doi.org/10.1257/jep.9.4.97>

- Qi, G. Y., Shen, L. Y., Zeng, S. X., & Jorge, O. J. (2010). The drivers for contractors' green innovation: An industry perspective. *Journal of Cleaner Production*, *18*(14), 1358–1365. <https://doi.org/10.1016/j.jclepro.2010.04.017>
- Qu, S. Q., & Dumay, J. (2011). The qualitative research interview. *Qualitative Research in Accounting & Management*, *8*(3), 238–264. <https://doi.org/10.1108/11766091111162070>
- Rabionet, S. E. (2011). How I learned to design and conduct semi-structured interviews: An ongoing and continuous journey. *Qualitative Report*, *16*(2), 563–566.
- Rehfeld, K.-M., Rennings, K., & Ziegler, A. (2007). Integrated product policy and environmental product innovations: An empirical analysis. *Ecological Economics*, *61*(1), 91–100. <https://doi.org/10.1016/j.ecolecon.2006.02.003>
- Rennings, K., Ziegler, A., Ankele, K., & Hoffmann, E. (2006). The influence of different characteristics of the EU environmental management and auditing scheme on technical environmental innovations and economic performance. *Ecological Economics*, *57*(1), 45–59. <https://doi.org/10.1016/j.ecolecon.2005.03.013>
- Rexhäuser, S., & Rammer, C. (2014). Environmental Innovations and Firm Profitability: Unmasking the Porter Hypothesis. *Environmental and Resource Economics*, *57*(1), 145–167. <https://doi.org/10.1007/s10640-013-9671-x>
- Rubashkina, Y., Galeotti, M., & Verdolini, E. (2015). Environmental regulation and competitiveness: Empirical evidence on the Porter Hypothesis from European manufacturing sectors. *Energy Policy*, *83*, 288–300. <https://doi.org/10.1016/j.enpol.2015.02.014>
- Samuelson, P. A. (1969). Lifetime Portfolio Selection By Dynamic Stochastic Programming. *The Review of Economics and Statistics*, *51*(3), 239. <https://doi.org/10.2307/1926559>

- Saunila, M., Ukko, J., & Rantala, T. (2018). Sustainability as a driver of green innovation investment and exploitation. *Journal of Cleaner Production*, 179, 631–641.
<https://doi.org/10.1016/j.jclepro.2017.11.211>
- Schmalensee, R. (1993). The Costs of Environmental Regulations. *Massachusetts Institute of Technology, Center for Energy and Environmental Policy Research, Working Paper 93-015*.
<http://hdl.handle.net/1721.1/50210>
- Schmidt, C. (2004). The analysis of semi-structured interviews. *A Companion to Qualitative Research*, 253(41), 258.
- Scott, W. R., Christensen, S., & Christensen, S. M. (1995). *The institutional construction of organizations: International and longitudinal studies*. SAGE Publications, Incorporated.
- Shah, S. F., Alshurideh, M., Kurdi, B. A., & Salloum, S. A. (2021). The Impact of the Behavioral Factors on Investment Decision-Making: A Systemic Review on Financial Institutions. In A. E. Hassanien, A. Slowik, V. Snášel, H. El-Deeb, & F. M. Tolba (Eds.), *Proceedings of the International Conference on Advanced Intelligent Systems and Informatics 2020* (Vol. 1261, pp. 100–112). Springer International Publishing. https://doi.org/10.1007/978-3-030-58669-0_9
- Shanks, G. (2002). Guidelines for Conducting Positivist Case Study Research in Information Systems. *Australasian Journal of Information Systems*, 10(1). <https://doi.org/10.3127/ajis.v10i1.448>
- Simpson, R. D., & Bradford III, R. L. (1996). Taxing variable cost: Environmental regulation as industrial policy. *Journal of Environmental Economics and Management*, 30(3), 282–300.
- SKAO. (2020). *Handbook CO2 Performance Ladder 3.1*. Stichting Klimaatvriendelijk Aanbesteden & Ondernemen. https://media.co2-prestatieladder.nl/media/documents/Handbook_31_EN.pdf

- Song, Y., Sahut, J.-M., Zhang, Z., Tian, Y., & Hikkerova, L. (2022). The effects of government subsidies on the sustainable innovation of university-industry collaboration. *Technological Forecasting and Social Change*, 174, 121233. <https://doi.org/10.1016/j.techfore.2021.121233>
- Spencer, L., Ritchie, J., Lewis, J., & Dillon, L. (2003). *Quality in qualitative evaluation: A framework for assessing research evidence*. National Centre for Social Research. <https://core.ac.uk/reader/74376246>
- Steinmeier, M., & Stich, M. (2019). Does Sustainability Assurance Improve Managerial Investment Decisions? *European Accounting Review*, 28(1), 177–209. <https://doi.org/10.1080/09638180.2017.1412337>
- Suchman, M. C. (1995). Localism and globalism in institutional analysis: The emergence of contractual norms in venture finance. *The Institutional Construction of Organizations: International and Longitudinal Studies*, 39–63.
- Triguero, A., Moreno-Mondéjar, L., & Davia, M. A. (2013). Drivers of different types of eco-innovation in European SMEs. *Ecological Economics*, 92, 25–33. <https://doi.org/10.1016/j.ecolecon.2013.04.009>
- Turner III, D. W. (2010). Qualitative interview design: A practical guide for novice investigators. *The Qualitative Report*, 15(3), 754.
- Van Leeuwen, G., & Mohnen, P. (2017). Revisiting the Porter hypothesis: An empirical analysis of Green innovation for the Netherlands. *Economics of Innovation and New Technology*, 26(1–2), 63–77. <https://doi.org/10.1080/10438599.2016.1202521>
- Wang, S., Li, J., & Zhao, D. (2018). Institutional Pressures and Environmental Management Practices: The Moderating Effects of Environmental Commitment and Resource Availability. *Business Strategy and the Environment*, 27(1), 52–69. <https://doi.org/10.1002/bse.1983>

- Weng, M.-H., & Lin, C.-Y. (2011). Determinants of green innovation adoption for small and medium-size enterprises (SMES). *African Journal of Business Management*, 5(22), 9154–9163.
- Whiting, L. S. (2008). Semi-structured interviews: Guidance for novice researchers. *Nursing Standard (through 2013)*, 22(23), 35.
- Witzel, A. (2000). The Problem-centered Interview. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, Vol 1*, Methodical and Empirical Examples.
<https://doi.org/10.17169/FQS-1.1.1132>
- Yang, X., Wang, Y., Hu, D., & Gao, Y. (2018). How industry peers improve your sustainable development? The role of listed firms in environmental strategies. *Business Strategy and the Environment*, 27(8), 1313–1333. <https://doi.org/10.1002/bse.2181>
- Yin, R. (2010). Analytic Generalization. *Encyclopedia of Case Study Research*, 21–23.
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (Sixth edition). SAGE.
- Zahera, S. A., & Bansal, R. (2018). Do investors exhibit behavioral biases in investment decision making? A systematic review. *Qualitative Research in Financial Markets*, 10(2), 210–251.
<https://doi.org/10.1108/QRFM-04-2017-0028>
- Zhou, G., Zhang, L., & Zhang, L. (2019). Corporate Social Responsibility, the Atmospheric Environment, and Technological Innovation Investment. *Sustainability*, 11(2), 481.
<https://doi.org/10.3390/su11020481>

Appendix 1: Interview guide

Briefing & getting acquainted:

- The researcher thanks the interviewee for participating and introduces himself. He tells the interviewee that his name is Rens Nagtegaal, he is 24 years old, is enrolled in the Master Economics: International Political Economy at the Radboud University and is conducting this study for his Master Thesis. Next, he explains the topic of the interview, namely the decision-making process for environmental sustainability investments in this specific firm.
- The researcher asks the interviewee to introduce themselves and the firm they work at, including their position in the firm, possible other positions they held previously, activities of the firm and the size of the firm. If anything is unclear in this regard, follow-up questions are asked by the researcher.
- The procedure for the interview is laid out for the interviewee. The interview will be held, and if permission is given, recorded, after which it can be properly transcribed, summarised, and sent back to the interviewee for a member check. The researcher tells the interviewee the findings from the interviews will be analysed and used anonymously, without traceability to the individual interviewee.
- The researcher asks for permission to record and start the interview and does so when permission is given.

Interview questions:

Introduction of the case

1. What is the goal of the investment or the programme of which this investment is a part? Or which environmental sustainability investments are currently or were recently at play in your firm? (Introducing question)

The role of environmental sustainability reporting

2. What induced your firm to consider this investment?
 - a. Did environmental sustainability reporting play a role in this? (Proposition 1)
3. What made clear this was a (financially) interesting investment?

4. What are you currently doing with respect to environmental sustainability reporting or what were you doing in this regard at the time of the investment decision concerning the investment discussed? (Proposition 1)
5. Did environmental sustainability reporting make you more aware of certain inefficiencies in your production process or supply chain which were eligible for improvement through investment? (Proposition 1)

The role of subsidies and fiscal incentives

6. Have you made use of any investment subsidies or tax breaks for this investment? If so, how were you acquainted with said subsidies or tax breaks? (Proposition 2 and 4)
7. Was the subsidy or tax break essential for a financially sound business case? (Proposition 2)
8. Would you have engaged in the investment if you had not gotten the subsidy or tax break? Was that business case still financially sound? (Proposition 2)

General factors at play and location

9. What are the (most important) factors at play in making such a decision in your opinion and perception? (Proposition 1, 2 and 3)
10. Was the subsidy or tax break a reason to execute this investment specifically in the Netherlands or Europe instead of somewhere else? (Proposition 2)

Environmental managerial concern

11. How important is sustainability as an aim in itself with respect to profitability and risk in the decision concerning an environmental sustainability investment? (Proposition 3)

Appendix 2: Overview of firms contacted and interviews conducted per industry

| Industry | Number of firms contacted | Number of interviewees |
|-------------------------------|---------------------------|------------------------|
| Waste processing & collection | 36 | 5 |
| Chemicals | 39 | 3 |
| Advice | 3 | 1 |
| Renewables | 2 | 1 |
| Industrial | 9 | 1 |
| Agriculture | 1 | 0 |
| Metallurgy | 5 | 1 |
| Printing | 1 | 0 |
| Packaging | 3 | 0 |
| Resources | 1 | 0 |
| Food and beverages | 9 | 0 |
| Furniture | 17 | 5 |
| Soil investigation | 1 | 2* |
| Total | 127 | 19 |

*: two interviewees represented the same firm, from the soil investigation firm

Appendix 3: Overview of conducted interviews

| Interview number | Date interview | Length interview | Function title | Type of firm | Investments discussed | Note |
|------------------|----------------|------------------|--|----------------------------------|---|-----------------------------------|
| 1 | 29/Mar | 35 minutes | Project manager | Waste collection | Electric trucks | Double interview with interview 2 |
| 2 | 29/Mar | 35 minutes | Financial controller | Waste processing | Improving sustainability of waste processing installations | Double interview with interview 1 |
| 3 | 30/Mar | 32 minutes | Manager finance & control | Waste processing | Replacement of flue gas scrubber | |
| 4 | 06/Apr | 42 minutes | Founder, managing director & senior consultant | Sustainability subsidy advice | Sustainability investment subsidies | |
| 5 | 06/Apr | 43 minutes | Manager technology & development | Waste processing | Replacement of cogeneration plant | |
| 6 | 12/Apr | 39 minutes | Tactical and innovation advisor | Metal goods production | Replacement of CO ₂ laser cutter with fibre laser cutter | |
| 7 | 13/Apr | 31 minutes | Coordinator business control | Waste processing | Diaper recycling factory | |
| 8 | 19/Apr | 42 minutes | CFO | Production of food machines | Solar panels | |
| 9 | 21/Apr | 22 minutes | Chief project manager | Green hydrogen plant contractors | Green hydrogen plants | |

| | | | | | | |
|-----------|--------|------------|--|-----------------------|---|---|
| 10 | 21/Apr | 42 minutes | Procurement & facilities director | Furniture manufacture | Improving sustainability of terrain including solar panels and improving insulation | |
| 11 | 28/Apr | 36 minutes | Manager R&D, technology, and projects | Chemical production | Replacement of incinerator | |
| 12 | 09/May | 42 minutes | CFO | Furniture manufacture | Hydrogen gas supply of oven | |
| 13 | 09/May | 25 minutes | CFO | Paint production | Heat pump and heat regeneration installation | |
| 14 | 10/May | 33 minutes | CEO | Furniture manufacture | Solar panels | |
| 15 | 10/May | 43 minutes | Head of technology and machine procurement | Furniture manufacture | Powder coating installation and hydrogen gas supply of oven | Subsidiary firm of the firm of interview 12 |
| 16 | 16/May | 32 minutes | CFO | Furniture manufacture | Replacement of sprayer machines | |
| 17 | 16/May | 55 minutes | Head of Tax | Soil investigation | Methanol propulsion for ships | Same firm as interview 18 |
| 18 | 22/May | 24 minutes | Global Director Safety & Sustainability | Soil investigation | Methanol propulsion for ships | Same firm as interview 17 |
| 19 | 30/May | 35 minutes | Operations & International Sales Manager | Chemical production | Solar panels | |