Bridging barriers to energy efficiency: the challenge for Dutch office buildings

An investigation into corporate adaptation to climate policy, the energy transition, and strategic responses in office buildings

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Abstract

The urgency of addressing climate change has resulted in the implementation of proactive climate policies across multiple sectors. Including the business sector, where regulations aim on the energy efficiency and sustainability within companies' facilities. In the Netherlands, recent regulations have imposed significant energy efficiency requirements on office-based companies, particularly concerning the energy efficiency and sustainability of office buildings. This research investigates the impact of Dutch climate policies on companies within the business sector, focusing on how these companies adapt their office buildings and sustainability strategies to comply with the new energy efficiency regulations. Through a combination of semi-structured interviews and thematic analysis, this research explores the practical measures companies are taking to meet energy efficiency standards, the challenges they face in implementing these measures, and the role of internal corporate motivation in driving sustainability initiatives.

Three main regulations are included and investigated in this study: the minimum energy label C for office buildings, the energy savings obligation (including the recognised measures list), and the Energy Efficiency Directive (EED) audit obligation. The study provides detailed insights into how involved companies navigate the technical and organisational complexities of complying with these policies, including negotiating with landlords for rented office spaces and balancing compliance costs with financial viability. Additionally, this research highlights the extent to which companies' sustainability practices are driven by regulatory compliance or by a deeper commitment to social corporate responsibility in sustainability. Long term strategies and culture will be included in this research to create a more complete view of companies' stance and strategies.

By presenting a nuanced analysis of the effects of Dutch climate policy on the business sector, this research contributes to the broader understanding of how companies are responding to the evolving sustainability landscape and energy efficiency goals in the business sector. The findings inform both policymakers and companies on effective strategies for enhancing energy efficiency in office buildings while addressing the practical and organisational barriers to implementation.

Keywords: Dutch climate policy, energy efficiency, sustainability, office buildings, business sector, energy label C, EED audit, energy savings obligation, responsive regulation

Executive summary

The increasing urgency of climate change and the regulations implemented, aiming to tackle climate change are having a significant impact on the business sector. Office buildings play a leading role in driving energy efficiency and sustainability within the business sector. As visible symbols of urban development and as well-known visible companies, office buildings have the potential to lead by example in demonstrating the feasibility and benefits of sustainable practices. This thesis investigates how Dutch companies are responding to energy efficiency regulations, specifically focussing on the minimum energy label C requirement, the energy savings obligation, and the Energy Efficiency Directive (EED) audit obligation. These regulations aim to reduce carbon emissions and enhance energy efficiency in office buildings and facilities, aligning with national and global climate objectives.

Through semi-structured interviews with facility managers, sustainability officers, and energy advisors, the research highlights the various actions companies are taking to meet these regulations. Common actions include upgrading to LED lighting, improving insulation, and integrating renewable energy systems. Larger companies, with sufficient resources, are more often able to implement these measures within their broader sustainability strategies. These companies often exceed compliance and leverage energy efficiency as a competitive advantage. In contrast, smaller companies in this study focus on cost-effective measures to meet the legal requirements, as they face more constraints in terms of budget and resources.

Despite these efforts, systemic challenges remain for companies. Financial constraints, the split-incentive dilemma between landlords and tenants, and administrative burdens impede the full realisation of energy efficiency goals. To address these challenges, the research proposes a six-phase framework that offers a practical roadmap for companies to navigate regulatory demands while advancing sustainability and energy efficiency within their facilities and strategies.

The framework begins with a detailed assessment of current energy performance, allowing companies to prioritise improvements and establish clear short-term and long-term energy targets. The next step is sufficient strategic financial planning, emphasising the importance of leveraging available incentives such as tax breaks and green financing. For tenant companies, resolving the split-incentive issue through shared-cost agreements with landlords is important. Effective stakeholder collaboration is another cornerstone, fostering alignment between landlords, tenants, and other stakeholders to ensure coordinated energy strategies.

Building internal capacity and awareness of sustainability is crucial for long-term and significant sustainable progress. Companies are encouraged to invest in training programs and knowledge-sharing initiatives, empowering their teams to independently implement energy-saving measures. Continuous monitoring and transparent reporting ensure alignment with evolving regulations and maintain stakeholder trust. Finally, the framework emphasises the importance of adaptability. Through encouraging companies to anticipate future regulatory changes and technological advancements. By investing in innovative solutions like smart meters and AI-driven analytics, businesses can stay ahead of compliance requirements while optimising energy performance.

This structured approach not only addresses the challenges identified in this study but also positions office buildings as leaders in the energy transition. Larger firms can use the framework to refine their existing strategies, while smaller companies gain actionable steps to

overcome resource limitations and integrate sustainability into their operations and long-term strategies.

The findings and proposed solutions contribute to academic discourse by filling a knowledge gap on how non-industrial, office-based companies navigate energy efficiency regulations. Beyond academic contributions, this research provides practical insights for policymakers and corporate stakeholders. Calling for adaptive and inclusive policies that reflect the diversity of organisational capacities. By addressing these challenges systematically, the study emphasises the role of office buildings in achieving a sustainable future and advancing in national climate objectives.

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1. Problem introduction

The development of European climate policy has caused a change in the corporate view on the approach of sustainability and energy efficiency within facilities. The transition towards sustainability is an obligation and companies must adapt using different strategies to shift towards sustainability in a feasible manner. Dutch regulations and guidelines derived from European policy obliged companies in all sectors to cooperate to the greater cause: reducing the nationwide emissions and climate pollution. The latest climate regulations aims on companies that are not known for their big impact on pollution and high energy usage. Examples include the business sector, telecom and health care. In case of health care, research has stated that reducing energy usage in this sector is from big importance for informing and making people conscious about becoming more sustainable as a society. Institutions without intensive energy usage, as the mentioned sectors are, can provide an example by catching up in sustainability in comparison to sectors where sustainability is prioritised as the energy sector and the industrial sector (van Elst, 2022).

Global warming has caused a worldwide focus on energy transition and efficiency. Real estate which includes office buildings, causes 30 percent of energy usage and 39 percent of the total emissions of carbon dioxide (IEA, 2022). This highlights the importance of increasing energy efficiency and the space of improvement within office buildings. The business sectors energy usage is mainly based on their facility energy usage, which makes it important to investigate the effects of policy within this specific sector.

The business sector in this report consists of companies that have the main purpose to offer services. There will be companies included that are not meeting the criterium for a hundred percent, to pave the way for further research, exploring differences in energy efficiency among sectors.

Over the last decades, the Dutch government has implemented various policies aimed at enhancing the sustainability of the Dutch economy. In pursuit of the climate objectives set for 2030, new regulations were implemented from January 1st, 2023. These regulations target companies with a specified annual energy consumption. Such entities may fall under the purview of the Energy saving notification obligation (RVO, 2019), necessitating their compliance with energy-saving measures exhibiting a payback period of maximum five years.

1.1 European policy (Paris agreement)

Dutch climate policy is derived from European legislation, which is shaped by international agreements in turn, by the Paris Agreement for example. The Paris Agreement, which is implemented in 2015, set the global objective to limit global warming to well below 2°C. Aiming with efforts to keep it even within 1.5°C (United Nations, 2015). In response to this, the European Union (EU) developed the European Green Deal and subsequent legislation, such as the Energy Efficiency Directive (EED) and the Energy Performance of Buildings Directive (EPBD), aimed at drastically reducing greenhouse gas emissions and improving energy efficiency (European Commission, 2020). These directives require member states to implement national policies that contribute to the EU's climate targets, which include a 55% reduction in emissions by 2030. In the Netherlands, these European directives have directly led to regulations like the energy label C obligation for office buildings (RVO.nl, 2018) and the EED audit requirement (EED Auditplicht, 2017). Nevertheless, the scope of this research is focused on Dutch climate policy and regulation. However, it remains important to acknowledge that

these national policies are deeply rooted in the broader European climate framework, which is itself a response to global agreements like the Paris Agreement. Therefore, it could be interesting to investigate companies of different backgrounds, to compare international and Dutch based companies.

1.2 Dutch policy

The prescribed measures, with a payback period of five years, are described and presented in the recognised measures list (Erkende maatregelenlijst), motivating businesses to adopt strategies contributing to energy efficiency and sustainability in their operations (RVO, 2022). Companies situated in office buildings are allowed to use a restricted quantity of 225 kWh/m^2 annually to maintain an energy label C. (RVO, 2018) Office buildings failing to meet these standards, are prohibited from serving as an office following this regulation. Companies are obliged to enhance sustainability not only in their housing but also in their production process. To stimulate companies further in their process towards sustainability, the EED audit obligation is activated, which obliges companies to investigate improvement areas in their operations for energy efficiency (RVO, 2017). This imperative aligns with the Dutch corporate governance code, where companies commit to adhering to these policies (Ministerie van Economische Zaken, 2023).

Effects of the latest climate policy are yet to be determined due to a lack of time for research since its implementation. Investigating the consequences of this policy and the challenges companies experience, offers valuable insights for future climate policy. Determining the impact on companies requires structured research into this subject with a company specific approach. The legal framework governing businesses exhibit variations contingent upon factors regarding the sustainable measures taken by companies.

Emphasising the sociotechnical dynamics of the scope, the social aspect is determined within the willingness of businesses to actively cooperate with governmental policies. These policies aimed at achieving climate goals oblige companies to take measures for energy savings (Dunlop& Völker, 2023). The research in the social aspect of the system revolves around determining whether firms are transitioning towards sustainability based on intrinsic motivation or in response to the implementation of the latest climate policy.

Exploring the effects of newly implemented climate regulations for Dutch businesses is a suitable topic for a CoSEM master thesis. It requires an in-depth analysis of a system whereas both technical and social aspects are relevant. The courses managing multi-actor decision making and law and institutions are relevant for investigating effects of regulations and how stakeholders anticipate them. Furthermore, the subject is strongly related to the E&I track of the CoSEM program especially the courses Sociotechnological of Future Energy Systems and Electricity and gas: market design and Policy Issues. These courses provided the required knowledge about the energy system and market prior to this proposal.

1.3 Knowledge gap

The Dutch climate policy, particularly regarding energy efficiency in office buildings, has imposed significant new requirements on the business sector. Regulations such as the energy label C obligation and the energy savings obligation (RVO, 2018) stimulate companies to make their office buildings more sustainable. However, there remains a limited understanding of how companies are incorporating these policies into their operations, particularly in the service-

oriented sectors that are not traditionally energy-intensive. The literature overlooks the specific challenges faced by companies in this context, such as the negotiation processes with landlords for rented buildings and the operational difficulties of upgrading office facilities (Eichholtz et al., 2023).

A primary gap in the existing research lies in the lack of detailed evidence on the measures companies are taking to comply with these policies. While tools like the recognised measures list (EML) provide guidance, there is little information on the sustainability strategies and on how effectively businesses are using these resources or the specific energy-saving actions being implemented, such as building insulation, HVAC upgrades, or lighting improvements (RVO ,2022). The practical barriers to compliance, including financial limitations and the lack of technical expertise, also remain underexplored, making it difficult to assess the full impact of these regulations on corporate sustainability practices (RVO.nl 2017).

Additionally, the role of the specific companies' culture and internal motivation in adopting energy efficiency practices is not well understood. Much of the existing research focuses on compliance driven by external pressures, but it remains unclear whether companies are motivated by intrinsic commitments to sustainability, such as those tied to corporate social responsibility (Schaltegger et al., 2022). This aspect is crucial for understanding the long-term sustainability of corporate initiatives, as it influences whether companies continue to invest in energy efficiency beyond regulatory requirements.

By investigating how Dutch companies are integrating climate policies into their office building operations, this research addresses these gaps. It will provide insights into the measures taken, the challenges faced, and the cultural factors influencing sustainability decisions, offering practical insight and recommendations for future policy development and corporate action.

This research places itself within the broader academic discussion on regulatory frameworks and corporate sustainability by drawing on Ayres and Braithwaite's Responsive Regulation (1992) and Black and Baldwin's Really Responsive Risk-Based Regulation (2010). These frameworks, while complementary, provide distinct yet interrelated perspectives to understand how regulatory strategies can adapt to varying organisational capacities and compliance behaviours, offering a robust foundation for analysing corporate responses to energy efficiency policies.

Ayres and Braithwaite's research "Responsive regulation" (1992) introduced the enforcement pyramid. This is a concept that shows how regulatory actions can escalate depending on how organisations or entities behave. The idea is simple: start with voluntary measures like guidance and incentives, and if compliance doesn't follow, move toward stricter actions, such as fines or sanctions. This approach highlights a flexible way of regulating, adapting to the level of cooperation from those being regulated. (Ayres & Braithwaite, 1992). This flexibility in enforcement is particularly relevant in the context of sustainability. In sustainability the capacity for adaptation varies across firms. For example, large organisations may leverage compliance as a competitive advantage, while smaller firms often require tailored, less coercive support mechanisms. By situating Dutch climate policy within this subject, this research explores the relevance of such adaptive enforcement in fostering both compliance and broader environmental goals in the Netherlands.

Black and Baldwin's research "Really responsive regulation" (2010) advances this discussion by emphasising the need to align regulatory strategies with the operational realities of

companies. Their framework underscores the importance of understanding the specific motivations, constraints, and systemic barriers faced by different organisations (Black & Baldwin, 2010). This perspective is particularly interesting in the Dutch business sector, where office-based firms could encounter unique challenges. By integrating this theoretical lens, this research highlights how regulatory frameworks can be more equitable and effective by accommodating organisational diversity and fostering long-term behavioural change.

This thesis leverages these theoretical insights to dissect the regulatory landscape of Dutch climate policy, focusing on critical mandates such as the energy label C obligation and the energy savings obligation (RVO, 2022). These policies provide a practical context to examine how office-based companies navigate regulatory demands amidst financial, operational, and organisational constraints. Through empirical analysis, this research identifies patterns in compliance behaviour, illustrating how different firms balance regulatory adherence with broader sustainability ambitions.

SMEs are underrepresented in existing literature on energy efficiency and regulatory compliance. Fairman and Yapp (2005) emphasise that SMEs often lack the resources and expertise to navigate complex regulatory frameworks. Which results in limited engagement with sustainability and energy efficiency initiatives. Gunningham (2009) further highlights the need for regulatory approaches tailored to the unique constraints of SMEs. The research suggests that simplified, accessible frameworks can significantly enhance compliance. This research fills this gap by examining how SMEs in the Dutch business sector could adapt to energy efficiency regulations. While also exploring strategies that address their resource limitations and external dependencies.

By bridging these theoretical frameworks with empirical findings, this research makes two key contributions to the academic discourse. First, it expands the relevance of responsive regulation by investigating how adaptive enforcement strategies can facilitate sustainable transitions in non-industrial corporate settings. Second, it refines responsive regulation by offering concrete evidence on the importance of aligning regulatory mechanisms with the distinct operational contexts of SMEs and large firms alike. These insights inform policymakers on designing inclusive, adaptive regulations that not only ensure compliance but also promote proactive sustainability initiatives, thereby achieving a balance between environmental and economic outcomes.

1.4 Research question

Due to the recent implementation of climate policies in the Netherlands, there has been limited research into their consequences and impacts. The motivation and internal challenges companies experience and face during the energy transition as a direct result of this climate policy, is therefore difficult to derive from previous research. Investigating the specific measures taken by companies and the challenges they encounter is therefore crucial. To comprehensively examine the effects of the 2023 Dutch climate policies on businesses in the office sector, this research is guided by the following overarching question:

How are Dutch companies in the business sector incorporating Dutch climate policy related to energy efficiency into their office building operations?

By focusing on company-level case studies, this research will offer a detailed analysis of the various regulatory impacts on business operations in their offices and the sustainable measures

adopted in response to the new climate policies. A company-level case study allows for a deeper understanding of the consequences of these regulations on companies and their office buildings.

Sub questions

In the previous sections, it has become clear that this thesis will conduct research towards the consequences and influences of Dutch climate policy companies within the three distinct sectors. The sustainable measures taken by companies to achieve sustainability goals in the industrial, services and energy sectors will be analysed and compared constructively. To construct a fundament for answering the main research question, three sub questions have been formulated.

Q1. What are the differences in climate policies and regulations applicable to companies in the Dutch business sector, and how do these regulations impact different types of office buildings?

This sub-question seeks to compare the various climate regulations, such as the energy label C requirement and the energy savings obligation and assess how they affect companies based on factors like building ownership and size. The distinction between companies that own versus rent their office spaces will be emphasised to understand the varying levels of control businesses have over sustainability measures (RVO, 2023). Desk research is suited to gather the information necessary to present an overview of the regulations for the sector and exclusion grounds for companies. Whereas size, ownership and country of operation could be of importance to determine whether a company must comply or not.

Q2. What measures have companies in the business sector implemented to improve the sustainability of their office buildings in compliance with the 2023 climate policies?

This question is meant for investigating the specific actions taken by companies to enhance energy efficiency and meet the new regulatory requirements, including compliance with the energy label C obligation, the energy savings obligation, and the energy audit requirement under the European energy efficiency directive (EED) (RVO 2023; RVO.nl 2017). The energy label C mandates that office buildings meet a minimum energy standard, pushing companies to implement measures such as insulation upgrades, energy-efficient lighting, and HVAC improvements(Asim et al., 2022; Eichholtz et al., 2023).

The Dutch government's recognised measures list (EML) guides companies in adopting energy-saving practices with a payback period of five years or less (RVO 2022). This research will explore whether businesses are effectively using the EML and energy audits to identify cost-effective solutions. Interviews with sustainability managers will provide insights into the specific technologies and strategies being implemented, and how differences in building ownership or company size may affect their choices or strategies regarding energy efficiency (Azari 2014; Georgievski 2012).

Q3. What challenges do companies face in implementing energy efficiency measures, and how are they overcoming these obstacles?

To emphasise a focus on the technical, financial, and organisational challenges companies encounter during the implementation of energy efficiency measures, this question will be investigated. Companies may face barriers such as high upfront costs, financial or technological limitations, or internal resistance to change (Eichholtz et al., 2023). For businesses in different

circumstances, different challenges may arise from negotiating with property owners for necessary building upgrades or being responsible for multiple facilities could create a lack of overview for example.

The research will also explore how companies are overcoming these obstacles, identifying strategies that can inform future policy developments and support businesses in achieving compliance with climate policies (RVO, 2022). Interview data will be used to analyse the real-world experiences of businesses during their energy efficiency improvements and sustainability practices.

1.5 Report structure

This report is structured to guide the reader through a comprehensive analysis of how Dutch climate policies, in the context of energy efficiency in office buildings, are affecting companies. In specific the companies operating within the business sector and mainly service oriented. The chapters are designed to structure the research in a clear manner. Beginning with the foundational concepts of the research, moving through the methodological approach, and followed by the results of the analysis of the collected data. Ending with a general conclusion and providing limitations to this research and findings or insights that could be useful for further research. Below is an outline of what to expect in the different chapters, along with a brief explanation of their content and relevance to the overall research.

Chapter 2 provides the theoretical foundation for the research, defining key concepts such as energy efficiency and sustainability, while exploring relevant Dutch energy efficiency policies. It discusses regulations such as the minimum energy label C obligation, the energy savings obligation, and the Energy Efficiency Directive (EED) audit obligation. These concepts are contextualised within Dutch and European climate policies, offering essential background for understanding the challenges and strategies examined in later chapters.

Chapter 3 outlines the research methodology, focusing on the use of semi-structured interviews to collect qualitative data. It starts with explaining the rationale behind this approach. Followed by presenting the criteria for selecting interviewees and companies, and the structure of the interviews. The chapter also describes how thematic analysis was applied to interpret the data systematically. This ensures that the findings are both reliable and reproducible for further research.

Chapter 4 presents the findings of the research, focusing on the challenges and strategies companies adopt to comply with climate regulations. It highlights insights from the interviews, including examples of companies implementing sustainability measures. The results are organised around themes such as compliance with energy label C requirements, the recognised measures list (EML), and the operational barriers companies face in aligning with regulations.

Chapter 5 synthesises the key findings and situates them within the broader context of corporate energy efficiency and the energy transition. It discusses issues such as financial constraints, landlord dependencies, and sectoral differences in regulatory adaptation. Practical recommendations, including green leases and targeted financial incentives, are presented. The chapter also introduces a framework for companies to develop and implement energy efficiency strategies in their facilities and operations.

The concluding Chapter 6 integrates the findings to address the research questions, highlighting how Dutch climate policies influence corporate energy strategies. It emphasises the need for regulatory frameworks that align with corporate capacities and encourages beyond-compliance practices. The chapter also explores the scientific and societal relevance of the research and suggests areas for further study, such as longitudinal research and cross-national comparisons to enhance the effectiveness of energy efficiency policies.

2. Definition of core concepts

The increasing urgency of climate change has led to the implementation of climate policies across various sectors. In the Netherlands, recent climate policies have placed significant pressure on companies to enhance the energy efficiency and sustainability of their office buildings and its operations (RVO,2022). While substantial research has been conducted on sustainable building practices and the role of policy in driving environmental change, a notable gap exists in understanding how these regulations specifically influence the business sector, particularly in the context of office buildings as which has become clear in the first chapter.

This second chapter aims to outline the core concepts of this research by exploring the intersection of energy efficiency in sustainable office buildings and the latest regulations implemented in the Netherlands. Specifically, it will examine what these regulations mean for companies in the business sector as they strive to meet new sustainability standards (RVO, 2022). Furthermore, this chapter will provide the necessary context to answer the first sub-question, offering a comprehensive understanding of how these regulations influence companies' actions towards sustainability. By focusing on these main areas, the research seeks to contribute to a deeper understanding of the context before exploring the influences of climate policies on office building sustainability (Vink et al.,2010). Providing a comprehensive understanding of the situation of Dutch climate policy on sustainable offices, and particularly the built environment of the corporate Dutch business sector.

The scientific literature has been collected through databases. The literature review for this study was conducted using multiple methods. First, relevant papers on the specific subject were examined. Following this, the citations within these papers and the studies that cited them were analysed to identify key literature in the field. This technique is called snowballing and results in significant relations between the scientific literature used for background information for this research. Furthermore, literature searches were performed using Google Scholar and Science Direct databases, to gather more information regarding the subject of climate regulations in similar cases and countries.

In this chapter a description of the context and core concepts will be provided. The information required for obtaining a comprehensive understanding of this research towards sustainable regulations and its impact on companies in the business sector will be presented. At first, an explanation of these core concepts will be elaborated to present a clear description of these concepts in this research. Followed by the explanation and clarification of the three different regulations regarding the sustainability in Dutch office buildings. Above that, previous studies in this subject, or similar situations will be reflected and consulted to create a comprehensive situation of the current situation.

2.1 Energy efficiency

One of the main criteria and aims of climate regulations is energy efficiency, a broad concept that entails much of the sustainable developments. Energy efficiency refers to the optimisation or improvement of energy use to achieve the same level of output or service with less energy input. Energy efficiency covers a wide range of practices, technologies, and behaviours that collectively contribute to reducing the overall energy demand of systems, processes, and devices (Oikonomou et al., 2009). The primary goal of energy efficiency is to minimize energy waste, ensuring that energy is utilized in the most productive manner possible. This concept is critical across various sectors, including industrial processes, transportation, energy usage of

buildings, and commercial operations (Gillingham et al., 2009). In all sectors it is the aim to increase the output per unit of energy input to remain or even increase the production rate on a similar level.

From a macro perspective, energy efficiency is a cornerstone of sustainable development in buildings. By reducing energy consumption, energy efficiency helps mitigate the environmental impacts associated with energy production and use, particularly the emission of greenhouse gases that contribute to global climate change (Gillingham et al., 2009). Energy efficiency as target by itself, also plays an important role in energy security by decreasing dependence on non-renewable energy sources, which are finite and environmentally damaging (Baublys et al., 2015). Additionally, increasing the energy efficiency in general, offers economic benefits beyond reducing energy costs. By lowering operational and maintenance expenses, companies can reinvest the savings into growth, innovation, and sustainability initiatives. These options have the potential to enhance their competitiveness and financial stability as a company (Jaffe and Stavins, 1994). On a broader scale, energy efficiency stimulates economic growth by creating jobs, reducing reliance on imported energy, and improving national competitiveness. In this research the scope is narrowed down to energy efficiency within companies itself. These themes have gained in importance and attention over the past years due to geopolitical challenges and conflicts. Therefore, the subject and target of improving energy efficiency has been widely involved in decision making processes among different sectors. Energy efficiency also builds resilience against energy price fluctuations and future regulatory changes, positioning businesses and economies for long-term stability and success while contributing to environmental sustainability (Bell, 2014).

2.1.1 Energy efficiency in the context of office buildings

When narrowing the concept of energy efficiency to the specific context of sustainable office buildings, it is defined as the capability of a building to minimise its energy consumption while maintaining or enhancing the functionality, comfort, and productivity of its employees (Parida et al., 2021). Which includes employees and clients that will visit and operate within the building. This involves multiple criteria and aspects that integrates advanced building technologies, strategic design choices, and efficient operational practices to reduce energy demand and improve overall building performance and the behaviour of the occupants. (Georgievski, 2012). In office buildings, energy efficiency directly supports the reduction of greenhouse gas emissions, contributing to the global fight against climate change and setting an example for other businesses and sectors. By reducing energy demand, energy-efficient buildings reduce the strain on power grids in the area they are operating in, particular during peak usage times, which can help prevent blackouts and reduce the need for additional power generation capacity. In that sense, the built environment of offices is contributing to community by reducing the tense situation of the power grid in the Netherlands in the current situation (Cox et al., 2020). Therefore, next to an own interest in a more efficient energy usage, the contribution to the public infrastructure is significant and is considered as being an example role.

Lastly, energy efficiency can translate into substantial cost savings over the lifespan of the office building. Lower energy bills, and potential incentives or tax benefits for achieving high energy efficiency standards can make a significant difference in the financial viability of sustainable office projects (Georgievski, 2012). The companies considered in this research, private companies, have in general a strong economic incentive in their decision-making. Therefore, the economic advantages of energy efficiency and sustainability can play an important role in the motivation to invest in more sustainability within office buildings. At last, energy efficiency in office buildings impacts the indoor environmental quality, which has been

linked to occupant health, comfort, and productivity. A well-designed, energy-efficient building provides consistent temperatures, adequate ventilation, and suitable lighting, all of which enhance the overall well-being of its occupants (Wilkinson et al., 2011).

2.1.2 Energy efficiency measures for office buildings

The building envelope itself, which consists of walls, windows, roofs, and floors, plays an important and critical role in the energy efficiency of office buildings. Enhancing the building envelope involves using insulation with high Rd- or Rc- values, or using insulation at all could improve the buildings efficiency significant by reducing energy usage via heat loss (Azari, 2014). Which could be achieved for example by installing energy-efficient windows, consisting of HR++ glass or FINEO glass for monumental buildings or other materials that reduce heat loss in winter and heat gain in summer (Milieucentraal.nl, z.d.). By improving the thermal performance of the building envelope, less energy is required for heating and cooling, which are in general the largest energy consumers in office buildings (Azari, 2014). Reducing energy loss leads to reducing the amount of energy that is needed to facilitate a functional and comfortable environment at the workplace.

Heating, ventilation, and air conditioning (HVAC) systems are vital for maintaining indoor comfort for employees but can also be significant energy consumers. Higher energy consumption results in a less energy efficient environment in an office building, since production rate of operations in the business sector is not directly related to energy intensive practices. Energy-efficient HVAC systems are designed to use less energy while providing the same level of comfort (Felgueiras et al., 2016). This can be achieved through replacements of older technologies with modern technologies such as variable speed drives, advanced heat pumps, and energy recovery ventilation. Above that, replacing old HVAC equipment with modern equipment could enhance energy efficiency of these installations. Efficient HVAC systems also include smart controls that optimise operation based on occupancy and external weather conditions, further reducing unnecessary energy use (Asim et al., 2022).

Lighting is another area where energy efficiency can be improved in office buildings. The use of LED lighting, which consumes significantly less energy than traditional incandescent or fluorescent lights and could therefore make a significant difference in energy usage (El-Zein, 2013). Further, integrating lighting controls such as dimmers, movement or occupancy sensors and daylight harvesting systems allows the lighting to adjust automatically based on the presence of occupants and the availability of natural light, reducing energy consumption without compromising the work environment (Wilkinson et al., 2011). There are different interventions to enhance the energy efficiency of lighting in office buildings, with large differences in costs and significance.

While reducing energy consumption is a main focus of energy efficiency, integrating renewable energy sources is also an essential aspect of energy efficiency and sustainability in office buildings. By generating energy or heat on-site through solar panels, wind turbines, or geothermal systems, office buildings or other facilities can reduce their reliance on external energy sources and lower their carbon footprint. Above that, it is possible to connect their facilities to local energy generating sites, such as windmills. The use of renewables not only enhances the sustainability of the building but also contributes to long-term energy cost savings (Georgievski, 2012). During this research, companies and their decision-making progress regarding solar panels and connections to wind parks, or geothermal sources, will be investigated. However, the purchase of climate or emission allowances of greenhouse gas emissions, or green energy certificates will be left out of the scope.

Beyond the physical aspects of the building, energy efficiency is also achieved through intervening in operational practices. This includes the use of advanced building management systems (BMS) that monitor and control energy use in real-time, optimising the performance of HVAC, lighting, and other systems that consume energy in offices (Georgievski et al., 2012). Regular maintenance, energy audits, and occupant engagement programs could further ensure that the building operates at peak efficiency. Eventually, managing the behaviour of occupants influences the energy efficiency and sustainability of the whole building and company as well. Transport and behaviour on sight as heating in the winter and cooling in the summer could be altered in favour of a sustainable practice. Therefore, providing information and raising awareness of employee behaviour on sustainability could be considered as category of sustainability measures (Parida et al., (2021), Pellegrini-Masini & Leishman, (2011)). The culture and vision of companies will be researched because of interesting insights in long-term strategies on energy-efficiency in offices and companies.

2.1.3 Sustainability in offices

Sustainability and energy efficiency are separate concepts and have significant differences in required and specific approaches. Sustainability is considered as the integration of reducing waste, commodities and individuals consuming behaviour (Parida et al., 2021). While different climate regulations often aim on reducing the energy consumption of the building (RVO, 2022), there is a set of sustainability regulations. Examples are the prohibition of plastic straws and the waste separation on an individual's level, which often consists of separating coffee cups and rest waste in an office. Sustainability in offices is focused on educating employees and reducing the consumption of single-use packages, cutlery, cups, or other waste (Ministerie van Algemene Zaken, 2023b). Aiming to recycle waste as much as possible or allow partner companies to collect this waste and re-use or recycle the materials from the separated and processed waste.

Moreover, stimulating or influencing the sustainable behaviour of employees is not limited to waste separation and management. It also entails the transport to the office and diet during working hours (Farooq et al., 2021). Stimulating vegan canteens and transporting by train or electric vehicles could be considered as sustainability measures (Ministerie van Algemene Zaken, 2023b). In conclusion, there is a significant difference between sustainability and its measures and energy efficiency and the associated measures. In this research, the focus is aimed at the energy efficiency within companies' office buildings and their policy. Therefore, it is important that the difference between the terms is presented and explained.

2.2 Scope of Dutch energy efficiency policy in this research

In Europe, there has been a focus on climate policy for years by the European Union (Commission of the European Communities, 1992) and energy reduction for companies has grown priority during the last decade. Previous research has investigated the ideal office building based on cases over different locations in Europe, mainly focusing on technical aspects and heating energies used at office buildings (Moreci et al.,2015). While keeping regulations and policies in mind, however the scope differs to this research and regulations have changed over the years. Now, the situation is different as a result of the latest regulations in Europe and especially the Netherlands compared to when the research was conducted in 2016.
Other research focusses on the effect on corporate reputation of firms that have proven to invest in their sustainable office buildings (Pellegrini-Masini & Leishman, 2019). Concluding from the research, corporate behaviour is shaped by individuals' values within the company and that

this could accelerate the pace of change within a company. This is a valuable insight for the research towards the decision-making process and sustainable office buildings in the Netherlands. Unless the difference in scope between this previous research and this study, it is useful to keep in mind during interviews with companies.

European climate policy has increasingly emphasised energy efficiency as a cornerstone of its broader sustainability goals, particularly within companies' operations and facilities. The European Union (EU) has set ambitious targets for improving energy efficiency across member states, aiming for a reduction in energy consumption and a significant decrease in greenhouse gas emissions. These goals are operationalized through directives like the Energy Performance of Buildings Directive (EPBD, 2010), which mandates that all new buildings must be nearly zero-energy by 2021, and existing buildings must undergo significant upgrades to improve energy performance.

In the Netherlands, these European directives have been translated into national regulations specifically targeting the sustainability of office buildings. For example, the Dutch government has introduced requirements such as the mandatory energy label C for office buildings by 2023, pushing businesses to invest in energy efficiency measures. This focus on the commercial sector, rather than on households, is particularly important given the substantial energy consumption and carbon footprint associated with office buildings. Previous regulations and research have focused on households which are a different type of real estate and policy making (Ministerie van Economische Zaken, Landbouw en Innovatie, 2020). Therefore, previous researches have focussed on sustainable development in building houses and making housing more energy efficient. Making a distinction in sustainable building and sustainable living allows the research of van Dorst (2012) to have similar concepts as in this research. Comparing the energy usage of a house with an office, leads to determining similarities in the use of the building. However. the research of van Dorst (2012) focusses on both sustainability in building as sustainability in living and using the house. In contrast, this research will be focussing on solely sustainability in the usage of the office.

While there is a growing amount of research on energy efficiency, much of the existing literature has focused on residential buildings rather than offices in the business sector. This creates a knowledge gap in understanding how policies affect office buildings in the Netherlands specifically, as stated in chapter 1. Moreover, studies that do address energy efficiency in commercial settings often overlook the practical implementation of these policies within businesses, particularly in relation to compliance with new regulations. Comparable research has investigated for example the labelling of companies and how "green" their building has been rated, which is on some points similar to the minimum energy label C in the Netherlands (Cass, 2020). However, the obligation of a minimum level of the label as is implemented in the Netherlands (RVO, 2022) is positioned in the context of the United Kingdom. As a result, this research aims to fill that gap by analysing interview results from key stakeholders in the Dutch business sector, providing insights into how companies are responding to and implementing these energy efficiency measures to ensure the minimum label C, but also how they cope with other obligations following the climate regulations from 2023.

Comparatively, other EU nations have also implemented similar regulations but there are variations in the stringency and enforcement of these policies (Ministerie van Infrastructuur en Waterstaat, 2024). The Netherlands, with its strict timeline and specific targets for office buildings, represents one of the more proactive approaches in the EU. By comparing these national policies, this research not only highlights the Dutch experience but also contributes to

a broader understanding of how different regulatory interventions impact the pursuit of energy efficiency in the corporate building sector across Europe.

This research focuses on the scope of three pivotal energy efficiency regulations in the Netherlands, all of which possibly have significant implications for businesses due to their recent implementation as of January 1st, 2023 (RVO, 2024). The first regulation mandates that office buildings must meet a minimum energy label C (RVO,2018), a requirement aimed at improving the energy performance of commercial properties (Eichholtz et al., 2023). The second regulation, the energy saving obligation, is enforced through the recognised measures List, which specifies actionable steps businesses must take to reduce energy consumption (RVO, 2022). Lastly, the EED (Energy Efficiency Directive) audit obligation requires large enterprises to conduct regular energy audits to identify potential energy-saving and emission reduction opportunities. The research is focussed on these regulations due to their recent enforcement, which presents a timely opportunity to assess their impact and effectiveness in driving energy efficiency within the Dutch business sector and the way this sector is handling these regulations.

2.2.1 Minimum of energy label C for office buildings

To stimulate the business sector to become more sustainable, an obligatory label is introduced for office buildings in the Netherlands. This energy label obligation is aimed to make companies in the business sector commit to climate policy. Real estate is responsible for 39% of CO_2 emissions globally and for 30% of the global energy usage (IEA,2022) and therefore is the corporate real estate an important target for sustainable regulations in the Netherlands. Previous research investigated the effects of this specific regulation and results, whereas results stated that renting firms in offices did not adapt the regulations significantly (Eichholtz, 2023). Therefore, it is interesting to investigate in this research the motivation, challenges and choices these firms have faced with the use of a conversation or interview.

The policy has multiple exclusion grounds based on the size and design of the utility space as office. At first, if the used surface of the office is less than 50 percent of the total utility space of the building it does not have to commit to the energy label. Secondly, this is also the case when the utility space is less than hundred squared meters. Above that, offices are being excluded depending on their status, where different exclusion grounds can be the reason. For example, offices that are considered as a monumental building by the government are not obligated to commit to the minimum energy label. Furthermore, there is an exception if the office building will be in use for (less than) 2 years or when it concerns an office building that is expropriated or purchased in the context of the Expropriation Act (Wetten.nl “onteigeningswet”, 2024).

Local governments and municipalities are responsible for enforcing this obligation. Which has resulted in an amount of 63% of the office buildings has committed to the energy label C or better per the first of April 2024 and 77% of the office space in the Netherlands (RVO, 2024). The first results of the minimum energy label show an increase in number of percentages in the office buildings with at least an energy label C presented in previous research (Eichholtz et al., 2023).

At last, the exclusion grounds can be based on properties of the building. If the office building does not make use of energy for heat in the interior or if the required sustainability measures do have an estimated payback period of more than 10 years, the office is excluded from this regulation (RVO, 2024).

Otherwise, these exclusion grounds do not stand for an office building, it is obligated to operate in a building with a minimum energy label C. When companies rent or operate a building with an energy label less than C, a company is not allowed to use this building as an office anymore. This is based on the Buildings and Living Environment Decree (Ministerie van Algemene zaken, 2024) back in 2018.

Table 1: Exclusion grounds for energy label C compliance

Exclusion ground	Explanation
Office space < 50% of total utility space	If office usage is less than 50% of the total building space, the building is not required to meet energy label C.
Office size < 100m²	Offices smaller than 100m² are not required to meet the energy label C obligation.
Monumental office buildings	Buildings that are listed as historical monuments are exempt from the energy label C requirement.
Short-term usage of the office building (<2 years)	Offices intended for short-term use (less than 2 years) do not need to comply with energy label C.

2.2.2 Energy savings obligation

The energy savings obligation is aimed at a broad range of businesses with an annual energy usage of at least 50.000 kWh and (the equivalent of) 25.000 m^3 gas (RVO, 2022). This regulation is specifically aimed at buildings with utility functions that have a negative impact on the environment. These locations consist of shops and offices for example. The owner of the building is responsible for taking sustainability measures related to the building itself and the user of the building is responsible for the activities at the particular site (wetten.nl, 2020). This leads to the fact that there is a possibility that two different organisations could have an energy savings obligation.

The Environmental Management Act and the Building Decree require organisations and companies to implement all energy-saving measures with a payback period of less than five years (RVO, 2022). These measures are listed in the Recognised Measures List (EML) and include actions such as upgrading insulation, replacing traditional lighting with LED lighting, installing energy-efficient HVAC systems, and using smart energy management systems. Even buildings that are recognised as monuments must comply with these obligations, provided the measures do not compromise the integrity of the monument (EML, 2021).

From July first, 2023, the energy saving measures are obligatory to adjust (RVO, 2022). However, also measures that are aimed at the carbon dioxide reduction of a process or building are obliged. Generating renewable energy is an example of these obligatory measures that do not decrease the energy usage. However, these measures decrease the amount of greenhouse gas emissions. Measures aimed at reducing environmental impact of office buildings by increasing energy efficiency could return sustainable investments into profitability (Bremer et al, 2024). In this research it is interesting to derive motivations for firms to become more sustainable, costs, regulations or setting an example could be the driving forces.

Exclusion grounds have been set for companies to not commit to these regulations. At first, buildings that solely use renewable energy generated at the site of the utility building. Above that, the obligation is not for buildings that have an annual period for its utility function for less

than four months and less than 25% of its expected annual energy usage. Secondly, stand-alone buildings with a usable area of less than 50 m^2 and also buildings that are expropriated by the government and will be demolished (RVO, 2022).

Researching the impact and effectiveness of the Erkende Maatregelenlijst "recognised measures list" is of importance for understanding how regulatory frameworks can drive sustainable practices in the business sector. By analysing the implementation and outcomes of these recognised measures, determining whether such tools effectively promote energy-efficient measures is made possible. This research sheds light on the challenges companies faces in complying with energy efficiency, offering insights for improving future policies.

2.2.3 EED audit obligation and information obligation

The Energy Efficiency Directive is a guideline from the European climate policy aimed on using energy more efficiently to reduce European energy consumption (Energy Efficiency Directive, z.d.). In the Netherlands, one of the regulations following the EED, is the EED audit obligation. This obligation consists of companies investigating and reporting in a detailed manner their own energy flows and usage to the government. The target of this obligation is to improve the corporate understanding of their energy flows and improvement areas for sustainability within their facility or processes (RVO.nl, 2017).

The audit obligation aims on companies that meet the following criteria: The company consists of 250 full time employees, including participations in partner companies or related organisations. Above that, the company should have an annual revenue of at least 50 million euros and a balance sheet total of at least 43 million euros, including partnerships and related companies (RVO.nl, 2017).

Auditing obligations are implemented to result in more transparency regarding sustainability policy of companies. This information is used for adaption for further regulations and engagement strategies to motivate companies to cooperate in the energy transition (Maggiore et al. , 2023). The objective of the Energy Efficiency Directive (EED) audit obligation in the Netherlands is to encourage companies to optimise and reduce their energy consumption, ultimately enhancing energy savings and sustainability. This obligation is part of broader European efforts to improve energy efficiency and reduce CO_2 emissions, in line with the European Union's climate targets. For companies within the business sector, which includes for example law firms, financial institutions, and recruiting services (de Graaf, Steijn, 1997), the EED audit obligation focuses on identifying opportunities to improve energy efficiency within their operations which mainly take place within the office buildings. These businesses typically have significant energy demands, such as heating, cooling, lighting, and IT infrastructure within office buildings (De Groot, Morgenstern, 2009). The EED audit requires these companies to conduct a thorough examination of their energy use, identifying where and how energy savings can be achieved. Specifically, the audit mandates firstly that companies analyse their energy consumption. This involves a detailed assessment of the current energy use within the company, identifying the primary areas of energy consumption. (RVO.nl, 2017). Determining areas of energy consumption that will be prioritised to reduce or transform into sustainable energy consumption.

Secondly, the audit aims for companies to identify energy savings opportunities. The audit is aimed to reveal opportunities for energy savings. These opportunities might include the implementation of more efficient technologies, implementation or changes in organisational

behaviour and processes. The audit also requires an evaluation of the economic feasibility of energy-saving measures. This enables companies to identify the measures that are both financially and environmentally viable (RVO.nl, 2017). A cost-benefit analysis is required to determine the feasibility of the companies' sustainability measures. At last, companies are required to conduct these audits periodically (at least every four years) to ensure that energy-saving measures remain current and that new opportunities are continuously identified and reported.

For business sector companies, the EED audit obligation necessitates a systematic approach to energy management. This stimulates them to take proactive steps towards improving energy efficiency. This consequence should not only contribute to national and European climate goals but it has also the potential to result in cost savings and enhanced sustainability for the company. As a result of the fact that the implementation of this regulation has not been for longer than two years, it is interesting to investigate companies' experiences with this obligation.

Table 2: Key steps in the EED audit obligation

Audit step	Description
Energy consumption Assessment	Detailed analysis of the company's energy consumption, identifying major areas of energy use.
Identify energy savings	Determine opportunities for improving energy efficiency through technology upgrades, operational changes, or process improvements.
Economic feasibility evaluation	Conduct a cost-benefit analysis to assess the financial viability of proposed energy-saving measures.
Continuous audits	Companies are required to conduct energy audits every 4 years to ensure ongoing compliance and identify new opportunities.

2.2.4 Overview of Dutch energy efficiency policies in the business sector

The regulations are summarised in the overview in table 3 below. Now that the policies, energy efficiency and sustainability measures have been presented and explained, the aim of the research is to obtain a comprehensive understanding of the impact of these regulations on companies in the business sector and their buildings. Aiming to derive the way companies cope with regulations and how challenging aspects of sustainability are tackled or solved. Therefore, interviews will be conducted with professionals that are part of the decision-making process around the sustainability and energy efficiency within the office buildings, chapter 3 will elaborate further on this method of obtaining and analysing information for the research.

Table 3: Overview of regulations

Policy	Aimed companies	Regulations in short
Minimum of energy label C for office buildings	Applies to companies using office buildings, including both owners and tenants. Companies occupying buildings with over 100m² of utility space, except for listed monuments or those with exclusion grounds (e.g., temporary use or low utility space usage).	Requires office buildings to meet a minimum of energy label C, aimed at reducing CO_2 emissions and increasing energy efficiency. Non-compliance may result in companies being prohibited from using the building as an office. Enforced by local governments and municipalities. Enforced from 1 January 2023 and on.
Energy savings obligation	Targeted at companies using utility buildings (e.g., offices, shops) with an annual energy use of at least 50,000 kWh or 25,000 m³ gas. Both building owners and tenants are responsible for implementing energy-saving measures.	Mandates the implementation of energy-saving measures with a payback period of less than 5 years. Includes renewable energy generation measures. Enforced from July 2023, focusing on reducing environmental impact and energy use.
EED audit obligation	Applicable to large companies with at least 250 employees, annual revenue over €50 million, or a balance sheet total of at least €43 million. Focused on companies with significant energy use in office operations.	Obligates companies to conduct energy audits at least every 4 years to assess and reduce energy consumption. Audits must identify energy-saving opportunities and evaluate their economic feasibility, ensuring continuous improvement of energy efficiency. Enforced from 3th July 2023.

3. Methodology

In this chapter, we delve into the complexities of the research design, methodology and data sources used to address the fundamental research questions stated in chapter 1. First, the process of data collection and reasoning behind the choice for interviews as the primary means of data acquisition is explained. This includes an examination of the selection criteria for Interviewees, the formulation of interview questions, and the establishment of an interview protocol. To emphasise strictness and openness about the methodologies, the research is carried out following the guidelines of the ethics committee of the Delft Technical University, following the GDPR requirements.

3.1 Data collection

Answering the research question with regard to the differences between energy efficiency regulations and its aimed businesses. Desk research has been conducted for creating a comprehensive understanding of the latest climate policy in the Netherlands. At first, the regulations itself have been investigated aiming at three main factors: what does it entail, who is excluded from the regulation and what is its purpose. Investigating previous research in combination with the publications of the regulations have resulted in the aimed comprehensive understanding of the policies. The key findings are presented in chapter 2, which formed the basis for constructing the interviews.

The role of collecting data is of a big importance for the research conducted (Adams et al., 2007) . The choice for constructing semi-structured interviews was based on the fact that for this research, company specific information is required (Bryman, 2016). This qualitative research is focused on the how and the why of the issue for companies to become more sustainable (Adams et al., 2007). During a semi-structured interview there is an option to follow up on Interviewee's answers and investigate the research topic more intensively and deeply rather than for example surveys (Adeoye-Olatunde et al., 2021). Surveys are often more effective for reaching a large number of interviewees and therefore a wider audience group plus a more representative sample group. A disadvantage for this research is therefore that the number of interviewees is limited, due to the time costs of conducting interviews in comparison to spreading surveys. However, this enhances the depth and quality of the obtained information and therefore, conclusions could be drawn from a smaller sample size (Jain, 2021).

Semi-structured interviews

Structure and strategy of semi-structured interviews

The semi-structured interview format was chosen for its ability to balance both structure and flexibility during the conversation. The interview questions are based on findings from previous research on sustainability motivations within companies, ensuring that the key topics of interest are addressed (Tollin & Vej, 2012). At the same time, the format allows for adaptation during the conversation, giving the interviewer the flexibility to explore topics that may arise spontaneously during the interview (Adams, 2015). Due to the short term of the implementation of the regulations, there could be topics of interest that are yet to be mentioned in another research.

One of the main advantages of this format is its adaptability. Semi-structured interviews allow the interviewer to tailor questions based on the specific context of each interviewee and the company. This is important in a study involving professionals with different functions, such as

facility managers, sustainability managers, and office managers (Adeoye-Olatunde & Olenik, 2021). These individuals probably have different experiences and perspectives on sustainability practices and the impact of climate policies. The flexibility of semi-structured interviews enables the interviewer to delve deeper into areas that are relevant to each participant's experience and company to design a realistic image of the company's sustainability approach and actions. This personalised approach enhances the depth and relevance of the data collected (Adeoye-Olatunde et al., 2021). Above that, it prevents wasting time on asking questions that are irrelevant at a company, due to exclusion grounds for regulations for example.

Additionally, the semi-structured format ensures that all key topics related to the research are consistently covered across all the different interviews. Allowing the data collection to ensure comparability of the data. The structure provided by the interview ensures that each interview covers the same core areas. This makes it easier to identify patterns and draw conclusions across multiple interviews. At the same time, the flexibility of the format encourages open, free-flowing conversations. This allows interviewees to elaborate on their thoughts and provide insights that may not have been anticipated by the interviewer before the interview (Adams, 2015).

The conversational nature of semi-structured interviews also creates an open atmosphere during the interview. This can help build trust between the interviewer and interviewee, which is crucial for encouraging honesty and openness. This is especially the case when discussing potentially sensitive topics such as sustainability practices and regulatory compliance (Walshe, 2008). By creating a more informal and conversational dynamic, the semi-structured approach allows participants to feel more comfortable sharing their genuine thoughts and experiences, resulting in richer and more nuanced information in the form of data**.** Allowing to explore interesting findings more in-depth specific for each company.

Use of Microsoft teams and online interviews

The interviews for this research were conducted primarily online using Microsoft Teams, chosen for its robust functionality, ease of use, and secure communication features. The platform enables participants to join from any location, removing geographical constraints that would otherwise arise with in-person interviews (Janghorban et al., 2014). This accessibility was particularly important for engaging stakeholders from different regions across the Netherlands, which allows for ensuring broader participation to this research. Microsoft Teams also supports high-quality audio and video, which was essential for capturing both verbal responses and non-verbal cues. Facial expressions and gestures for example. These non-verbal elements are able to enrich the data and provide additional insights into the interviewees' perspectives (Adams, 2015).

The selection of Microsoft Teams reflects partially the increasing digitalisation of professional communication, which has accelerated since the COVID-19 pandemic. The platform offers useful tools for scheduling and flexibility, making it easier for participants to fit the interview into their busy schedules. This convenience reduces the barriers to participation, allowing the researcher to broaden the geographical scope and include diverse voices relevant to the study. Additionally, the platform's built-in transcription service expedited the transcription process, saving time compared to manual transcription. While automated transcription may occasionally misinterpret technical jargon or industry-specific terms, these inaccuracies were cross-checked and corrected manually using the original recordings to ensure accuracy (Adeoye-Olatunde & Olenik, 2021).

The decision to conduct the majority of interviews online rather than in person was influenced by practical and methodological factors. Online interviews eliminate travel requirements, allowing participants to engage in the research from their preferred location (Janghorban et al., 2014). This flexibility not only increases participation rates but also allows for greater inclusion of companies from various regions in the Netherlands. However, the research remains flexible: if requested or required, in-person interviews were arranged, ensuring that every opportunity to interview professionals from the working field was utilised. These in-person sessions followed the same protocols as online interviews, with Microsoft Teams still used for recording and transcription to maintain consistency. During the research only one interview is conducted in-person, with the use of Microsoft Teams to record the interview. This was done to ensure that this interview was conducted as similar as possible in comparison to the other interviews.

Recording the interviews was crucial for ensuring the accuracy and reliability of the collected data (Adams et al., 2007). By recording the sessions, it allows the researcher to engage more naturally with participants without needing to focus on extensive note-taking. This results in more natural and open conversations. This approach fostered a more conversational dynamic, which is particularly beneficial in semi-structured interviews where discussions may take unexpected directions (Adams, 2015). The recordings provided a temporary record that could be reviewed multiple times during the analysis phase, ensuring no critical details were overlooked. These recordings were deleted after the thesis was completed, in line with data protection protocols.

The combination of online interviews and Microsoft Teams provided a strategic approach to data collection for this research. It ensured the capture of accurate and nuanced insights while accommodating the practical needs of participants and adhering to GDPR requirements. The use of Microsoft Teams as a versatile and reliable tool allowed the researcher to maintain high standards of data quality while ensuring flexibility and inclusivity across diverse stakeholder groups (Janghorban et al., 2014; Adams, 2015; Adeoye-Olatunde & Olenik, 2021).

Recording and transcription of interviews

Recording the interviews is based on the idea of ensuring the accuracy and reliability of the data (Adams et al., 2007). By recording the interviews, the researcher can engage more naturally with the participant. Preventing the need to focus on extensive notetaking during the conversation. This allows for a more natural and organic dialogue**,** which is beneficial in semi-structured interviews where the conversation can take unexpected directions (Adams, 2015). The recordings also provide a temporary record (which are deleted after completion of the thesis) of the interviews that can be reviewed multiple times during the analysis phase. This is done to ensure that no critical details are missed and increasing the robustness of the research findings.

In addition to recording, Microsoft Teams' built-in transcription service is useful to help transcribing the interviews. This automated transcription process saves time compared to manual transcription and reduces the risk of human error, especially when dealing with multiple interviews. The ability to transform recorded conversations into text allows for a more accurate analysis and enables the researcher to focus on coding and thematic analysis earlier in the research process (Braun & Clarke, 2006). However, automated transcription is not perfect. Especially when the tool is capturing technical jargon or industry-specific terms. Nevertheless, it still offers a solid foundation for the qualitative analysis phase. Any inaccuracies in the transcription can be easily cross-checked with the original recordings and are corrected manually to prevent mistakes or misinformation (Adeoye-Olatunde & Olenik, 2021).

Duration of interviews

The decision to limit the duration of interviews to between 30-45 minutes is a balance between obtaining comprehensive data and respecting the time constraints of the participants. Participants are professionals with (probably) demanding schedules. A 30–45-minute time frame is typically sufficient for in-depth discussions on the core topics of the research while minimising the risk of participant fatigue or haste due to other appointments**.** This could affect the quality of responses toward the end when longer interviews are conducted.

In semi-structured interviews, there is room for both open-ended and specific questions. The selected duration allows for both structured questions and spontaneous exploration of unexpected themes that may emerge during the conversation. Moreover, the flexibility of the semi-structured approach ensures that while a set of core questions is covered, there is still room to delve deeper into certain topics if the interviewee has specific information or insights to share. This adaptability ensures that the interview remains focused and productive while allowing for depth and breadth in responses**.**

The decision to use Microsoft Teams for conducting, recording, and transcribing the (online) interviews, combined with the flexibility and structure of semi-structured interviews, creates a strategic and thoughtful approach for the data collection of this research. This methodology ensures that the research captures accurate and detailed insights while accommodating the diverse needs and constraints of both the researcher and the participants. The balance between structure and flexibility in the semi-structured format enhances the quality of the data collected, providing a comprehensive and nuanced understanding of the key issues at hand. This approach ultimately strengthens the research's ability to produce robust, actionable findings that contribute to the broader discourse on sustainability and corporate compliance with climate policies.

3.2 Selection criteria for including companies and interviewees in the study

Selection criteria of interviewees

The selection of interviewees is based on specific criteria to ensure that the research findings are both comparable and relevant within the context of the research. This study aims to investigate the impact of climate policy in the Netherlands on companies within the business sector. Focussing specific on how these companies are working to make their office buildings and business processes more sustainable and energy efficient. Before taking interviews, it is important to carefully construct the criteria whereas the choice for these interviewees is based on. This is crucial for creating sufficient and useful interview results. Selecting interviewees is vital for the qualitative research and collecting data depends strongly on this structured process, because the quality of both processes is determined by the quality of the interviews itself (Terhanian and Bremer, 2012). To obtain useful information for the research, the function of the interviewee should be entangled in the decision making progress regarding sustainability practices in the office building. The research aims to investigate the influence of climate policy within the Netherlands on companies within the business sector that has to become more sustainable, including their offices. As a result, the first criterium for the interviewee is that the company this person works at is operating within the business sector. In Table 4 an anonymous overview is given with characteristics of each company included in the research. Their real names are known by the researcher, however conversations and provided information are kept

discrete following agreements made following TU Delft guidelines as mentioned in the introduction of this chapter.

Table 4: Overview of companies and their properties

Company	Sector	Size	Function	Country of operation
A	Recruitment	1.000-5.000	Head of facilities	Dutch
B	Law	5.000-10.000	Facility manager	International
C	Telecom service	1.000-5.000	Manager sustainability	Dutch
D	Consultancy	10.000+	Facility manager	International
E	Consultancy	1.000-5.000	Facility manager	Dutch
F	Logistics / advisory	500-1.000	Energy manager	International
G	Telecom service	1.000-5.000	Facility manager	Dutch
H	Law	1.000-2.000	Facility manager	International
I	Broadcast	500-1000	Facility manager	Dutch
J	Financial Service	1.000-5.000	Facility manager	International
K	Real estate	100-300	Sustainable development manager	International
L	Energy Consultancy	51-200	Energy Advisor	Dutch
M	Law	500-1.000	Facility manager	International

Selection criteria of companies

The selection of companies for this research was guided by specific criteria to ensure the relevance and comparability of findings (Janghorban et al., 2014). Companies were included if they had dedicated roles or teams responsible for implementing sustainability initiatives in their office environments, as these roles are essential for providing insights into decision-making processes and practical measures for sustainability (Adams, 2015).

Both tenants and owners of office spaces were considered to compare how sustainability measures are implemented under different ownership structures. However, most participating companies were tenants, reflecting the broader trend in the Netherlands where businesses typically rent their offices. Tenants face unique challenges, such as negotiating with landlords, which adds complexity to implementing energy-efficient measures. To address these differences, additional questions were designed for companies owning their facilities (NVM, 2024).

The study included companies with 500 to over 10,000 employees, as smaller organisations often lack the necessary resources, such as facility managers, to implement and oversee sustainability initiatives effectively (Adams et al., 2007). Larger companies were prioritised because they are more likely to have sustainability teams, greater operational responsibilities, and larger facilities subject to stricter regulatory obligations (Pellegrini-Masini & Leishman, 2011). These organisations also face higher expectations for sustainability due to their visibility and scale (Carroll, 1999).

The research specifically focused on Dutch branches of these companies, as the climate regulations under investigation apply exclusively to office buildings in the Netherlands (Eichholtz et al., 2023). By including both international companies and those solely based in the Netherlands, the study captures variations in sustainability practices. International

companies must often align local compliance with global strategies, while Dutch-based firms may design sustainability efforts specifically around national policies and local market dynamics (Schaltegger et al., 2022; Farooq et al., 2021).

Selecting companies from the business sector was essential due to its distinct challenges in achieving sustainability, which often focus on energy efficiency within office environments rather than industrial processes (Takacs & Borrion, 2020). Including facility managers, sustainability managers, and office managers as key interviewees ensured that insights were provided by individuals directly involved in sustainability measures, making the data relevant and actionable (Hoendervanger et al., 2022; Hodges, 2005).

By focusing on companies with a structured approach to sustainability and ensuring diversity in scale and ownership, this research provides nuanced insights into how Dutch climate policies impact the business sector's sustainability practices.

3.3 Interview questions

This section provides an explanation of the rationale behind the selection of categories and the construction of interview questions used in this research. The study investigates the impact of recent climate regulations in the Netherlands on sustainable and energy-efficient office buildings within the business sector. The interview questions are strategically designed to capture comprehensive insights into how these regulations are being implemented by companies, particularly distinguishing between those that own their office spaces and those that rent. Additionally, the questions are tailored to reflect the differences in regulatory obligations, such as the EED audit, to ensure the research addresses the specific challenges and decision-making processes faced by different types of organisations. The interview questions are presented in an overview in Table 5 at the end of the section.

Rationale for selecting categories

The categories chosen for this research reflect the key aspects of how companies in the business sector are adapting to recent climate policies aimed at enhancing sustainability and energy efficiency in office buildings. These categories are structured to align with the distinct regulatory requirements, operational contexts, and roles within companies that are directly involved in implementing sustainability measures.

The first category focuses on the companies' and employees' backgrounds. Understanding the sector in which a company operates, its scale, and the specific role of the interviewee provides essential context for interpreting their responses. This background information is useful for capturing the diversity within the business sector and understanding how different organisational structures and roles influence the approach to energy efficiency and sustainability. The information regarding the company is useful for comparing similar companies in the analysis of the gathered data.

The second category addresses the minimum energy label C regulation, which is a critical aspect of the current sustainability framework for office buildings in the Netherlands. The questions in this category explore the specific measures companies have taken to comply with this regulation, as well as the timeline and criteria guiding these decisions. While the main focus is on companies that are tenants, the questions also include provisions for companies that own their office buildings. In case a company included in the study is owning (some of) their facilities. For tenants, the questions delve into the negotiation and cooperation processes with

property owners, reflecting the additional complexities they may face in implementing energy efficiency measures. For companies that own their buildings, the questions focus on the direct actions they have taken to meet the energy label C requirements.

The third category examines the energy saving obligation regulation, which requires companies to follow certain energy-saving measures. The questions are designed to assess how companies are complying with this regulation, including their use of the recognised measures list (EML). This category is crucial for understanding how companies in the business sector are integrating mandated energy-saving practices into their operations and the challenges they encounter in doing so.

The fourth category is entailing the EED audit obligation in the Netherlands. This regulation mandates certain companies to conduct energy audits and report their findings to the government. The questions here are specific to those companies that are subject to the EED requirement, focusing on how they identify areas for improvement, report these findings, and who within the company is responsible for these processes. For companies that are not obligated by the EED, the questions shift to explore whether they still engage in energy-saving practices voluntarily and who drives these initiatives within the organisation. This distinction is important as it helps to identify the influence of regulatory obligations versus voluntary actions on sustainability practices. During the interviews it will become clear that many companies will be obliged to this audit.

Finally, the general ending questions are designed to capture broader reflections on the challenges encountered during the implementation of sustainability measures and the company's overall stance on sustainability. These questions allow the research to assess whether the company's actions are primarily driven by regulatory compliance or by a deeper commitment to sustainability.

The selected categories and questions are justified by their alignment with the research objectives and the need to address the complexities of implementing sustainability regulations in office buildings. By focusing on the distinctions between measures taken in culture and in facilities, challenges faced, regulatory compliance, and voluntary measures, the research can provide a nuanced understanding of how different companies within the business sector are adapting to the latest climate policies.

The separation of questions based on whether a company owns or rents its office space reflects the different levels of control and responsibility these companies have in implementing energy efficiency measures. Owners generally have direct authority over the implementation of such measures, while renters may face additional layers of complexity, such as needing to negotiate with property owners. This distinction is crucial for understanding the varied challenges companies face depending on their ownership status.

Similarly, the differentiation between companies that are subject to the EED Audit obligation and those that are not allows the research to capture the varying degrees of regulatory pressure and how this influences the adoption of sustainability measures. By addressing both groups, the research can explore the impact of these regulations on companies' sustainability practices and whether those not legally bound by such regulations still pursue energy-saving initiatives.
In summary, the categories and questions have been carefully designed to capture the diverse and complex realities faced by companies in the business sector as they work to make their office buildings more sustainable and energy efficient. This approach ensures the relevance and

depth of the research findings, contributing valuable insights to the ongoing discussion about the impact of climate policy on the built environment.

Table 5: Interview questions

Introduction and questions about the company
1. What is the range of duties of your institution or company? What is the sector that your company works/operates in?
2. What is your role in the company?
3. Is your company/organisation owner of the office/utility location?
With regard to minimum energy label C regulation (owning the office or facilities)
4. What measures has your company taken to commit to the energy label C regulation?
5. When did your company start implementing sustainability measures these measures?
6. What criteria do you consider when making decisions about these measures?
With regard to minimum energy label C regulation (renting the office or facilities)
4. What measures has your company taken to commit to the energy label C regulation?
5. When did your company start implementing sustainability measures these measures?
6. What criteria do you consider when making decisions about these measures?
7. How was the procedure structured with the owner of the building during cooperating and deciding on the measures to reach energy label C?
With regard to the energy savings obligation
8. Do you have to follow the energy savings obligation regulation?
9. In what manner did your company make use the EML (recognised measures list)?
EED-Audit obligation (when applicable)
10. How do you investigate the areas for improvement within your company on the sustainability field?
11. and how are these findings reported to the (local) government?
12. Who or which company has the responsibility for this internal investigation?
When EED and/or energy savings obligation is not applicable
13. Even though you are not obliged to follow these regulations, do you apply energy savings measures? And if so, what?
14. Who is responsible for the decision-making process for becoming more sustainable within the company?
General ending questions
15. What challenges occurred during the implementation of these different measures and how were these tackled?
16. What is your companies' stance on sustainability? If it weren't for these regulations, would your company still have taken similar measures to improve energy efficiency of the company?
17. Do you have anything to add to this questions/ do you have a final comment?

The interview questions presented in the table above have been constructed to directly address and help answering the sub-research questions. This is structured by investigating the activities and strategies of companies in response to the 2023 Dutch climate policy. These questions are designed to capture a comprehensive understanding of the resulting measures companies have implemented, the challenges they have faced, and the strategies they employ to overcome obstacles related to sustainability and energy efficiency in their office buildings. Spare questions that could be of use during the conversation are listed in appendix A3.

In summary, the interview questions are strategically aligned with the research objectives and sub-research questions, to contribute to answering the research question. The interview questions are designed to obtain detailed information about the specific measures companies have taken in response to the 2023 Dutch climate policy. Above that, the challenges they face and the strategies they employ to overcome these challenges are part of this research as well.

By capturing these elements, the research can provide a nuanced understanding of how Dutch companies in the business sector are navigating the evolving landscape of sustainability regulations regarding office buildings. In this sense, the research is contributing valuable insights to the broader discourse on corporate sustainability and energy efficiency in the built environment.

3.4 Research analysis process

This chapter explains and outlines the methodology for analysing the qualitative data collected through interviews with key stakeholders involved in the sustainability efforts of office buildings within the business sector. The analysis focuses on understanding how recent climate policies in the Netherlands have influenced corporate strategies for improving energy efficiency and reducing environmental impact of their offices. A thematic analysis will be employed to systematically identify, organise, and interpret patterns within the data (Braun & Clarke, 2006). This method is well-suited for this research as it allows for a detailed examination of participants' perspectives while also providing the flexibility to take unanticipated themes into account, relevant to the study's objectives (Adams et al., 2007).

Thematic analysis is conducted in multiple stages, beginning with the transcription and familiarisation of the interview data. this is followed by coding and categorisation of key themes related to policy impact, challenges, and organisational responses. The iterative nature of thematic analysis ensures that the findings are deeply grounded in the data while allowing for the comparison of responses across interviewees and companies (King, 2004). The steps are shown in table 6 below. This approach is particularly effective for exploring complex, qualitative data as it provides a structured yet flexible framework for understanding how companies in the service sector are navigating the new regulatory landscape. Ultimately, this method will enable the research to yield rich insights into the practical implications of climate policy on office building sustainability.

Table 6: Overview of the different steps taken during the (qualitative) data analysis

Step	Description
Data preparation	Initial steps to prepare the data for analysis including collection and organisation.
Transcription and familiarisation	Transcribing interviews and familiarising with the content to identify key concepts.
Anonymisation and translation	Ensuring privacy by anonymising and translating the data into English.
Thematic analysis process	Main process of thematic analysis to extract meaningful patterns.
Familiarisation with data	Reading through the data multiple times to become deeply familiar.
Generating initial codes	Identifying important statements and creating codes for key concepts.
Searching for themes	Organising the codes and searching for overarching themes.
Reviewing themes	Refining the themes and ensuring they accurately represent the data.
Defining and naming themes	Finalising and clearly defining each theme with sub-themes if needed.
Writing the report	Writing the analysis report based on the identified themes.

3.4.1 Data preparation

The initial step involves transcription and familiarisation with the data. All interviews will be transcribed verbatim to capture the exact wording and nuances of the participants' responses. The transcription ensures that subtle meanings and contextual elements are preserved while analysing the qualitative data. This is essential for an in-depth qualitative analysis (Caudle, 2004). Once the interviews are transcribed, the next step is to familiarise with the data by reading the transcripts multiple times. This process allows the researcher to become familiar with the data, identifying initial observations, key concepts, and emerging patterns. These insights form the foundation for coding and thematic development, essential for understanding the core issues raised in the interviews (Adams et al., 2007).

There are two different steps to take before the analysis could be done after carefully construct the transcripts. The first step is to anonymise the interviews, which is done by hand due to the risks of leaking personal or confidential information regarding the interviewee or company. To ensure that the correct information is left out of the interview, the whole transcript is checked by the researcher for correct interpretation of sentences. The information that is filtered out of the interview transcripts does not only consist of personal names or the name of the company, but also the names of partnering companies that could be mentioned or specific projects that could be used to find the interviewees identity or the company the interviewee works for.

The last step to take before the analysis is to translate the transcripts. Due to the fact that the programs that will be used for the analysis are more efficient when the documents are in English, the Dutch transcripts have to be translated. The choice of conducting interviews in Dutch is based on the idea of making the interviewee feel comfortable in their native language. All of the interviewees had a Dutch country of operation and were confident in speaking in this language. The translations of the transcripts are done by the same program as the transcription: by word office. It has a strong translating function that translates the document as a whole. However, the translated transcriptions have to be revised manually to ensure the correct translation. In this manner, a misplaced nuance or insight could be avoided (Brinkmann and Kvale, 2018)

Translation also presents challenges, particularly when dealing with cultural aspects, technical jargon, or specific terms that may carry different connotations across languages. In qualitative research, where meaning is deeply tied to context, this process must be handled with care to prevent any misinterpretation or loss of critical insights (Adams, 2015). By ensuring accurate translation, the researcher preserves the richness of the data, which is essential for a thorough and valid thematic analysis.

The final stage in preparing the data for analysis consists of ensuring that all the steps (transcription, familiarisation, anonymisation, and translation) are conducted carefully and rigorously. These processes lay the foundation for a robust thematic analysis, which will explore patterns and themes within the data, revealing how companies perceive and respond to sustainability initiatives. With the data properly prepared, the researcher is positioned to conduct a valid and insightful analysis of the participants' experiences, contributing to a comprehensive understanding of sustainability practices in the office building sector (Hodges, 2005).

3.4.2 Thematic analysis process

The thematic analysis process follows the six-phase framework of Braun & Clarke (2006), which guides researchers through qualitative data analysis in a systematic manner. The first phase, familiarisation with the data, begins with reading the transcripts to gain a comprehensive understanding of the material. This is an essential step for identifying initial patterns and key concepts that will guide the subsequent analysis (Braun & Clarke, 2006).

Once familiarisation is complete, the second phase involves generating initial codes. In this phase, the researcher systematically highlights significant statements and assigns codes to segments of the data. These codes serve as labels for specific ideas, insights, or patterns that emerge from the interviews. Coding is an iterative process where the researcher breaks the data into smaller, manageable parts. Using qualitative data analysis software, as ATLAS.ti, allows the researcher to efficiently manage and organise the large volumes of data gathered during the interviews (Friese, 2014). Software assistance ensures accuracy and structure in handling the extensive data, preventing loss of relevant information and allowing for easy retrieval of coded segments. The code analysis is presented in the appendix B1 and B2, with a quantitative summary of the codes and a more comprehensive overview of the codes used in the analysis.

In the third phase, the analysis consists of searching for themes by reviewing and structuring the generated codes. Themes represent broader patterns that emerge from the coded data and reflect significant aspects of the research questions. For this study, key themes will likely include challenges faced by companies in improving energy efficiency, the specific measures they have taken to enhance sustainability, and how corporate views on sustainability influence these actions.

The fourth phase involves reviewing themes. This phase requires the researcher to refine the themes by checking their relevance to both the individual coded data and the dataset as a whole. During this stage, themes that are too broad may be separated into more specific sub-themes, while others may be merged if they overlap. Themes without sufficient supporting evidence will be discarded. This step is crucial for ensuring that the themes accurately capture the core insights of the data and contribute meaningfully to answering the research questions (Braun & Clarke, 2006).

In the fifth phase, defining and naming themes, the researcher clearly defines each theme, setting the boundaries for what each theme includes and excludes. This involves detailed analysis and reflection on the data within each theme to ensure coherence and consistency. Sub-themes may also be identified to provide structure and highlight the hierarchical relationships within the data. For example, under the theme "Challenges faced," sub-themes might include financial constraints, technological barriers, or regulatory complexities (Braun & Clarke, 2006). This level of detail allows for deeper insights into the multifaceted issues companies face in improving their energy efficiency within their office buildings.

The final phase, producing the report, involves constructing a coherent narrative around the identified themes and sub-themes. This report will not only describe the themes but also illustrate how they directly answer the research questions. To support the findings, direct quotes from participants will be included, adding depth and authenticity to the analysis (Sandelowski, 1995). The inclusion of participants' own words allows the readers to engage with the perspectives and experiences of the stakeholders involved (Caudle, 2004).

3.4.3 Reliability and flexibility of thematic analysis

The Braun and Clarke (2006) framework for thematic analysis is well-suited for this study on sustainability in office buildings, based on 13 interviews with facility managers. Its six-phase process, familiarisation, coding, theme identification, and report generation, ensures a systematic, thorough analysis. This method is ideal for managing the qualitative dataset (Sandelowski, 1995) while allowing for deep exploration without being overwhelming (King, 2004).

The framework's flexibility accommodates both inductive and deductive approaches, making it adaptable to the varying perspectives of facility managers (Brinkmann and Kvale, 2018). It enables the identification of emergent themes while exploring predefined concepts, ensuring a balanced analysis of sustainability practices and policies (Braun & Clarke, 2006).

By employing this approach, the study captures both common and differing responses, essential for understanding the challenges in implementing sustainable practices (Hodges, 2005). The framework's rigor also enhances transparency, with systematic documentation of codes and themes creating an audit trail for reliability (Caudle, 2004). Reflexivity ensures that the researcher's biases are acknowledged, increasing the study's credibility.

In analysing energy efficiency, the framework handles both explicit challenges, like budget constraints, and deeper organisational resistance, offering comprehensive insights for practical recommendations and policymaking (King, 2004). Its established credibility across disciplines (Brinkmann and Kvale, 2018) makes it ideal for this research, supporting a robust and reliable analysis.

The study aims to understand how companies perceive and respond to climate policies affecting office energy efficiency. Braun and Clarke's thematic analysis enables a detailed exploration of participants' experiences, yielding insights that can inform practical strategies and contribute to broader sustainability knowledge.

4. Results interview analyses

This chapter presents an analysis of energy efficiency practices in the business sector based on interviews conducted with 13 companies across various branches within the business sector. Focussing on the energy efficiency policy of these companies to cope with the requirements for office buildings in the Netherlands. The analysis aims to explore how these organisations are addressing the requirements of the 2023 Dutch climate policy, focusing on the measures they have adopted, the challenges they face, and how they manage internal energy efficiency issues regarding their business housing. Using Braun and Clarke's six-step thematic analysis framework, the chapter identifies key themes from the interviews and provides a comprehensive overview of the sustainability strategies employed by each company. The chapter concludes with an integrated thematic analysis across the interviews and presenting the key insights obtained from the qualitative research that has been conducted. First presenting the used method, followed by findings and summaries of the interviews per company.

The interviews, conducted with companies in industries ranging from legal services and media production to real estate advisors and telecom providers, provided rich insights into the practical steps these organisations are taking to meet climate policy requirements. The data revealed a range of different approaches to sustainability and energy efficiency. Ranging from proactive early adoption of technologies to reactive adjustments driven by regulatory pressure. Each interview offered a distinct perspective on the challenges of implementing sustainability measures. This is specifically the case in relation to regulatory compliance, operational costs, and internal cultural shifts. The internal cultural shift has been added to the research, due to the importance of this part for most of the companies included in the analysis. Findings regarding the adaptation of companies on energy efficiency measures in their offices and operations will be presented in this chapter, including the changes in view and culture of the included companies.

4.1 The effect of regulations on the included companies

This chapter analyses the challenges faced by various companies in complying with Dutch energy efficiency regulations, specifically focusing on the audit obligation, the recognised measures list, and the minimum energy label C requirement. The quantitative summary of the coding analysis is provided in appendix B, including extra information on how the coding is interpreted.

4.1.1 Energy label C requirement

The requirement for buildings to comply with energy label C poses significant challenges for companies, particularly tenants who are reliant on landlords for major energy upgrades. Many companies face limitations in directly implementing sustainability measures, such as improving insulation or upgrading heating systems, because these changes require cooperation from property owners. Older buildings further complicate compliance, especially when significant structural updates are needed. However, most companies have adopted proactive measures to meet or exceed energy label C requirements, with common solutions including LED lighting upgrades and the installation of solar panels. Companies that own their properties, have been able to adopt more comprehensive measures, such as thermal energy storage systems and heat pumps, but all firms face the challenge of balancing the costs of these upgrades with their long-term benefits. All companies in the study have met the requirement, except for one facility in one company. This is visualised in figure 1.

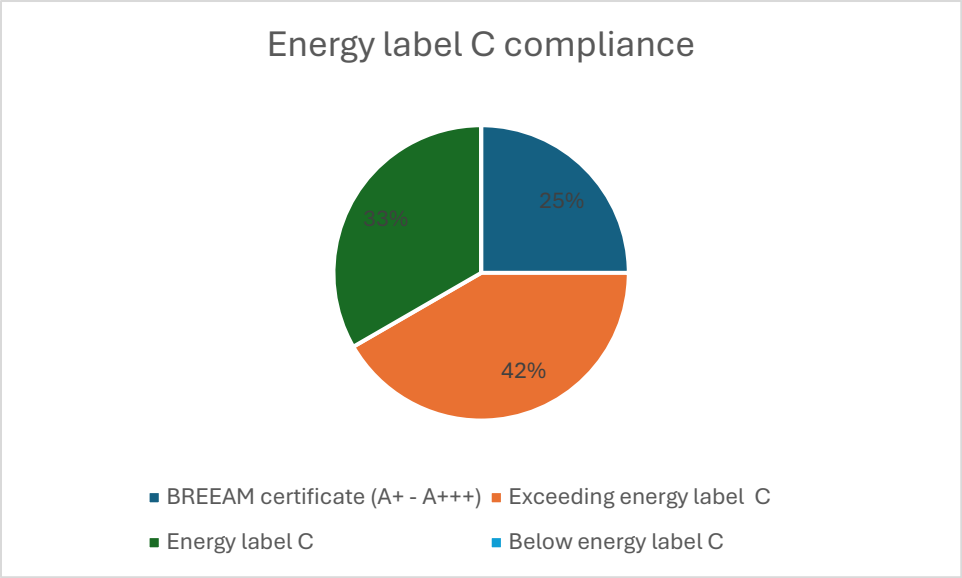

Figure 1: Level of energy label C compliance of companies taken into account during this research

To meet this requirement, all of the companies implemented LED lighting upgrades. This is probably due to the low cost and ease of the implementation. More than half of them installed solar panels or had them already in use when they start using the office or facilities. These measures were most widely considered to be quick wins with a clear payback period among the interviewed companies. Insulation improvements were often considered complex, due to the fact that most of the offices were rented. Above that, 54% of the companies considered changing heating systems with the use of heat pumps, but considered it often not sufficient for the size of the buildings they operate in. The frequency of the most mentioned implementation measurements are presented in Figure 2.

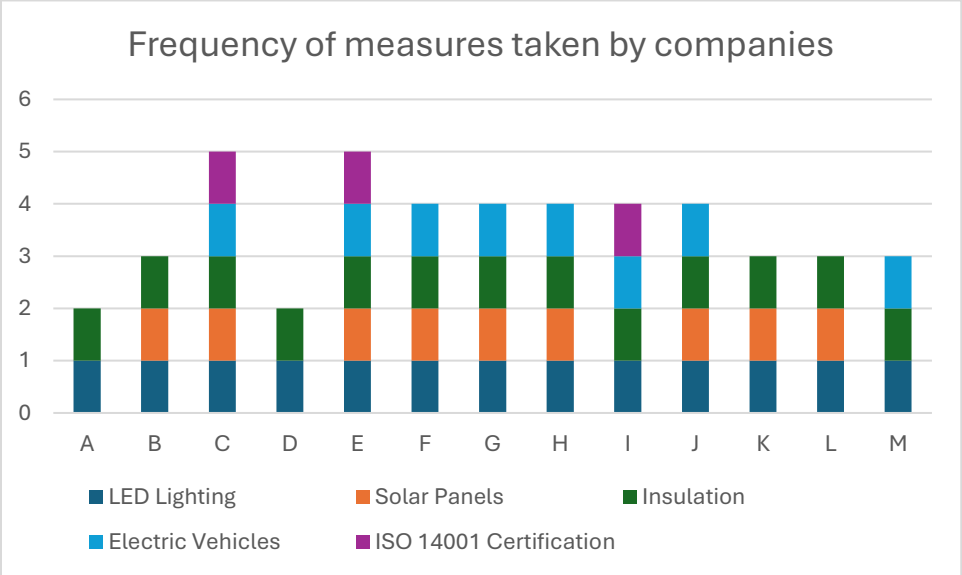

Figure 2: Frequency of measures taken by companies

4.1.2 Recognised measures list

Using the recognised measures list (EML) is another major factor in improving energy efficiency. The EML provides a detailed list of measures, but many companies find the measures extensive and sometimes difficult to implement without cooperation from landlords or external contractors. Other quick wins, such as automated lighting systems which a majority

of 77% of the companies had installed to improve their energy efficiency. Which is different from LED-lighting, automatic lighting is the system that shut lights off when there is no one a room. Also, water-saving devices, have been implemented across firms. These were less common than the LED lighting, due to the fact that only 3 out of 13 companies did implement measures regarding water savings. However, more extensive upgrades, such as replacing heating systems, often require significant financial investment and negotiation with building owners, were considered 40% of the time. While implementing these measures is rarely done by companies in this research. To meet the energy saving obligations, companies frequently conduct energy audits that lead to targeted improvements based on the recognised measures, often carried out with the help of external specialists. However, the recognised measures list was considered as specific and vague in multiple cases among companies. Decreasing its efficient goal of being a clear guideline for improving energy efficiency with a payback period of less than 5 years.

4.1.2 Energy audit obligations

The energy audit obligation and broader sustainability audits present administrative and financial challenges. Companies which operate in multiple locations, must devote considerable resources to ensure compliance. This is particularly burdensome given the detailed nature of the audits and the need to report on various sustainability metrics. Many firms engage third-party consultants to manage this process and ensure that reports are submitted correctly. In addition, companies are integrating sustainability into their broader business strategies, with regular CO_2 footprint assessments becoming common practice. While these efforts help align firms with long-term sustainability goals, challenges remain in coordinating these measures with the financial and operational realities of the business, particularly when sustainability investments involve long payback periods or are dependent on landlords.

To address this obligation, 69% of the firms integrated CO_2 footprint assessments or similar energy audits for energy efficiency into their strategies before the regulations. To align sustainability with business operations. The integration of continuous monitoring and significantly improving energy efficiency often required long-term investments, which some firms found challenging due to longer payback periods or dependency on landlord.

4.2 Analysis per company

This section provides an in-depth analysis of each company interviewed, summarizing key findings and insights from the transcribed interviews. To adhere to the privacy statement, both the names of the companies and interviewees are anonymized. The analysis focuses on critical topics relevant to this research: the structure and decision-making processes of sustainability teams, compliance with energy label C, adherence to other energy efficiency regulations, the challenges faced, and the overall perspective on sustainability. Table 7 presents an overview of the companies and their characteristics.

Table 7: An overview of each company, its size, and scope of operation

Company	Sector	Size	Scope of operation
A	Recruitment	1.000-5.000	Dutch
B	Law	5.000-10.000	International
C	Telecom service	1.000-5.000	Dutch
D	Consultancy	10.000+	International
E	Consultancy	1.000-5.000	Dutch
F	Logistics / advisory	500-1.000	International
G	Telecom service	1.000-5.000	Dutch
H	Law	1.000-2.000	International
I	Broadcast	500-1000	Dutch
J	Service	1.000-5.000	International
K	Real estate	100-300	International
L	Energy Consultancy	51-200	Dutch
M	Law	500-1.000	International

Through this analysis, we aim to explore each company's approach to energy efficiency and sustainability in light of recent climate policies in the Netherlands. Key areas of focus include how sustainability efforts are organised within the company, strategies used to meet energy label C requirements, specific challenges encountered, and their overarching attitude towards sustainability. A summary of these findings is presented in table 8, offering a comprehensive overview of trends and insights derived from the interviews.'

Examining team structures highlights the level of expertise and commitment within the companies to drive sustainable practices. Insights into their compliance efforts reveal common strategies employed, such as upgrading lighting systems or collaborating with landlords, to meet regulatory requirements. By analysing the challenges they face, such as financial constraints or reliance on property owners, this section provides a clearer picture of the practical barriers to implementing energy-efficient measures.

Table 8: Overview of summaries of all companies involved in the research

Company	Sustainability team & decision making	Compliance with energy label C	Challenges	View on sustainability
A (Recruitment)	No dedicated team: Facilities management works with landlords.	Mostly label B, or higher, dependent on property owners. ISO 14001	Reliant on landlords for upgrades, limited control over energy consumption.	Core focus; aims for CO_2 neutrality by 2030.
B (Legal)	Centralised, led by facility manager.	BREEAM-certified; automatically meets label C or higher.	Balancing costs and sustainability; limited opportunities beyond basic upgrades.	Practical; meets obligations but balances with efficiency.
C (Telecom)	Dedicated sustainability team (10 members); collaborative decision-making.	Mostly label B or A+.	Negotiating upgrades with landlords; supply chain issues.	Comprehensive; focused on CO_2 reduction and biodiversity.
D (Consultancy)	Fragmented; no centralised team, cost-driven decisions.	Label C met before regulations.	Limited control due to landlord responsibility.	Client-driven; focuses on balance between cost and sustainability.
E (Consultant /Financial Services)	Formal team with director; sustainability integrated into decision-making.	Exceeds label C, most buildings are A or A++.	Negotiating upgrades with landlords; high costs for older buildings.	Deeply integrated; sustainability as social responsibility.
F (Logistics/ Advisory)	Facilities team of 10; pragmatic, focused on high-impact measures.	Addressed Label C through consolidation and solar panel rollouts.	Large-scale operations; high costs for lighting systems.	Integrated, focusing on long-term smart energy solutions.
G (Telecom)	Dedicated sustainability team; data-driven decisions.	All offices rated A or A+.	Vast energy use in data centres and antennas, landlord cooperation challenges.	High priority; 95% CO_2 reduction goal by 2028.
H (Legal)	Facilities team oversees waste and mobility; landlord handles major upgrades.	BREEAM-certified, exceeds label C.	Limited by lease agreements and coordination with other tenants.	Embedded; focused on CO_2 reduction and employee mobility.
I (Media/ Broadcasting)	Decentralised, led by facilities management team (8 members).	Reliant on landlords, but have energy label C compliance: pursuing ISO 14001 certifications.	Coordination with landlords for structural upgrades; old buildings.	Central focus; preparing for CO_2 emissions reporting.
J (Financial Services)	Dedicated sustainability team led by director.	HQ exceeds label C (B or A): owned property equipped with solar and WKO.	Discrepancy between marketed and real efficiency; landlord cooperation.	Integral to strategy: CO_2 neutrality by 2030.
K (Real Estate)	Sustainability manager oversees	Met label C but constrained by historical	Limited control over building	Focused on sustainable portfolio; constrained by landlord decisions.

	development; tenant limitations.	building challenges.	upgrades due to landlord.	
L (Real Estate/Energy Consultancy)	Pragmatic approach with sustainability manager.	HQ energy-efficient, some older buildings below optimal. Meet label C.	Challenges with older buildings, cost-driven limitations.	Focus on compliance and cost-efficiency in client advisory.
M (Legal Services)	Facilities manager oversees sustainability.	BREEAM-certified; exceeds label C.	Long payback periods for improvements; shared spaces with other tenants.	Intrinsic motivation; aligns with Paris Agreement goals.

Finally, understanding each company's mindset toward energy efficiency and sustainability sheds light on whether their efforts are driven primarily by regulatory compliance or by a deeper commitment to making a positive environmental impact. This holistic approach not only identifies patterns and broader industry trends but also offers a foundation for developing strategies to enhance corporate sustainability efforts in the future.

Company A: Recruitment

Sustainability team and decision-making process: At Company A, decision-making regarding sustainability measures is partially constrained by their dependence on property owners, as they rent all of their office spaces. There is no dedicated sustainability team, however the facilities management works closely with landlords to implement energy efficiency improvements like LED lighting and other physical measures. The decision-making process involves yearly budgeting for sustainability measures, which are prioritised based on feasibility and impact. Although the company has clear goals, such as aiming for CO_2 neutrality by 2030, these are primarily driven by top management, and coordination with property owners is essential for any substantial building upgrades. In conclusion, targets are set by top management and the facilities management team is operating to achieve these targets in cooperation with the landlord.

Energy efficiency measures and compliance with energy label C: Company A, which rents its office spaces, faces limitations in its ability to directly implement energy-saving measures as it is dependent on property owners. Despite this, they have ensured that most of their 21 locations meet the energy label requirements, with nearly all offices now rated at Label B or higher. They addressed non-compliant buildings, such as a location with Label D, by relocating or planning demolition. For company A, implementing sustainability measures, such as installing LED lighting, began years before regulatory requirements were announced.

Challenges and measures: One of the key challenges highlighted by company A is their reliance on property owners for energy-related upgrades. This dependence creates barriers, especially when it comes to sustainability initiatives driven by the company's customers. They also struggle to gain insight into real-time energy consumption due to the lack of sub-metering in many properties. To overcome these challenges, the company actively engages in discussions with landlords to ensure sustainability improvements are made and focuses on building relationships that facilitate greener operations in the future.

View on sustainability: Sustainability is an important focus for company A, and they aim to achieve CO_2 neutrality by 2030. They have embraced sustainable materials and equipment, where possible, and regularly assess the energy performance of their properties. The company

also engages in ISO 14001[1]certifications, which helps in standardising their approach to sustainability. Their vision for sustainability is closely linked with their service offerings, as they work with younger employees who are presumably more conscious of environmental impact according to the interviewee.

Company B: Legal

Sustainability team and decision-making process: In company B, the facility manager holds primary responsibility for sustainability measures related to the building, including energy efficiency upgrades like solar panels and heat pumps. This centralised approach allows the facility manager to ensure that sustainability measures are integrated into daily operations and building management. Decision-making in this area is closely tied to cost considerations, with a focus on balancing sustainability efforts with operational efficiency. Sustainability is also treated as a long-term strategic priority, but the responsibility for implementing specific building-related sustainability measures lies mainly with the facilities team. Which consists of one person, the facility manager, which is remarkable in comparison to other companies. Due to the international identity of the company, energy efficiency targets are set mainly at top level management. The facility manager is responsible for the implementation of measures to achieve these targets.

Energy efficiency measures and compliance with energy label C: Company B ensures that all their office buildings are BREEAM-certified, focusing on high sustainability standards. This certification automatically ensures compliance with high energy label ratings (B or A), eliminating the need for additional measures specifically targeting energy labels. The firm employs a comprehensive approach, including solar panels, green energy, heat pumps, and sustainable materials from the ground up.

Challenges and measures Though the company maintains high standards, the challenges arise mainly from balancing operational costs and sustainability. Their approach is not dictated by cost savings alone but also by corporate goals to maintain sustainable practices. The firm also recognizes that office environments, unlike manufacturing, present limited opportunities for further energy reduction beyond basic measures such as LED lighting and insulation. However, they actively explore options like replacing outdated kitchen equipment that consumes excessive energy.

View on sustainability: Company B's approach to sustainability is practical, focusing on compliance with regulations and adopting improvements year by year. Although they acknowledge the push toward being a more sustainable organisation, their vision is balanced with running an efficient operation. Sustainability, for them, is not about being the most progressive organisation but rather about meeting all legal obligations while ensuring a sustainable but functional work environment.

Company C: Telecommunications

Sustainability team and decision-making process: Company C has a structured sustainability approach, driven by both a dedicated sustainability team and external specialists. This team is

[1] ISO 14001 is an internationally recognised standard for environmental management systems (EMS). It provides a framework that organisations can follow to improve their environmental performance and the ISO 14001 is granted to organisations that demonstrate compliance with the standard's requirements, ensuring they have effective processes in place to manage and reduce their environmental impact. This certification is commonly pursued by companies as part of their broader CSR strategies (ISO, 2015).

responsible for ensuring that energy efficiency audits are carried out, and they guide the implementation of upgrades across their office buildings and data centres. The decision-making process is a collaborative effort between facilities management, the sustainability team, and external contractors. They implement "quick wins" for energy savings but also plan for more complex initiatives like solar panel installations and fleet electrification. The sustainability team plays a crucial role in aligning the company's operational goals with long-term environmental targets, including reducing CO_2 emissions and meeting Paris-proof goals. This sustainability team consists of a team of around 10 members.

Energy efficiency measures and compliance with energy label C: Company C facilities consist of both office buildings and data centres. All buildings in their portfolio are compliant with or exceed the requirements for energy label C. Most of their properties are rated B or A (+) as part of their proactive approach to energy efficiency. The company has had a long-standing commitment to sustainability, which predates the 2023 regulations obligating energy label C compliance.

Challenges and measures: A key challenge for company C is negotiating energy efficiency improvements with building owners. As tenants, their sustainability goals often surpass those of the landlords, leading to potential conflicts. They have made significant efforts to align the interests of both parties by proactively engaging in discussions and even offering to co-finance certain investments, such as heating installations, which could lower utility costs for both parties. In terms of specific measures, the company has focused on both behavioural and technical quick wins, such as adjusting office temperature settings and optimising building usage during off-peak hours. They also conduct regular audits of their energy-saving measures and work with external contractors to implement these upgrades. They also used the recognised measures list for improving energy efficiency of their heating systems for example. The negotiations with the building owners have sometimes delayed energy efficiency investments. Furthermore, supply chain issues caused by market shortages and lengthy lead times for sustainable materials have also posed obstacles.

View on sustainability: Sustainability is a core element of company C's operations. Their approach is comprehensive, covering everything from energy savings in their offices to fleet management, where they have a plan to transition fully to electric vehicles by 2025. They also encourage cycling through a robust bike-leasing program that includes incentives for employees. Their broader sustainability strategy includes significant efforts in CO_2 reduction, waste management, and biodiversity. For instance, they compost food waste from company kitchens and integrate green spaces into their office environments to promote biodiversity. Additionally, they are exploring water management innovations to address potential future water scarcity.

Company D: Consultancy

Sustainability team and decision-making process: At this company, the decision-making around sustainability is somewhat fragmented, as they are tenants and must work closely with landlords for larger energy efficiency upgrades. There is no centralised sustainability team, but the facilities management team oversees smaller initiatives, such as LED lighting and insulation improvements. Sustainability measures are often costs-driven, which means that decision-making is reactive to top management needs and priorities of low costs rather than guided by a specific and clear internal sustainability strategy. While the company is committed to improving

its environmental impact, decision-making is constrained by the limited control they have over building infrastructure.

Energy efficiency measures and compliance with energy label C: Company D is a consultancy firm and works closely with building owners to meet sustainability requirements. Although not directly responsible for major energy upgrades, they oversee measures such as replacing older lighting systems with LED lighting and improving insulation. The company also works with external contractors to identify heat loss issues and implement energy-saving solutions, such as upgrading heating installations. The energy label C requirements were met years before the implementation of the regulation.

Challenges and measures: The primary challenge for company D is that most energy-saving opportunities lie within the control of the building owner. They focus on addressing minor issues, such as upgrading desk lamps and other loose equipment, while major building improvements like heating systems and insulation fall under the building owner's responsibility. The split responsibility between tenant and owner limits the company's ability to take initiative on energy efficiency measures.

View on sustainability: Sustainability, for company D, is largely driven by their clients' needs. They follow customer-driven sustainability policies but are also aware of the importance of improving their own fleet, paper usage, and other operational aspects that fall within their direct control. The company focuses on maintaining a balance between cost-driven decisions and sustainability initiatives, such as implementing electric vehicle policies where required.

Company E: Consultant and financial services

Sustainability team and decision-making process: Company E has a formal sustainability structure, with a sustainability department that includes a director and several employees. This team is responsible for setting sustainability goals, such as reducing CO_2 emissions, and regularly conducts annual sustainability reports to track progress. They work closely with external specialists to ensure compliance with regulations like the recognised measures list (EML). Decision-making involves both long-term planning for sustainability and short-term measures that align with regulatory requirements. The sustainability department is integrated into the company's decision-making process, ensuring that environmental goals are aligned with business strategies.

Energy efficiency measures and compliance with energy label C: Company E, which operates in the financial services sector, rents all of its office locations. They have proactively ensured that their office spaces not only comply with energy label C but often exceed this requirement, with many buildings holding higher ratings such as A and A++. The company has historically paid attention to energy efficiency, starting over 20 years ago, with a focus on bulk energy purchasing and efficiency improvements. Despite renting their office spaces, company E regularly assesses the energy labels of buildings before entering or renewing leases.

Challenges and measures: One of the key challenges the company faces is negotiating with property owners, particularly regarding energy-saving investments. Landlords often prioritise profitability over sustainability, making it difficult for tenants to push for significant improvements. However, the mandatory recognised measures list (EML) has helped by clearly outlining which party, landlord or tenant, is responsible for specific sustainability measures. This has enabled more structured discussions between company E and property owners. The company also focuses on long-term sustainability improvements when replacing older

equipment, opting for the most sustainable solutions whenever possible. For example, when appliances like refrigerators need frequent repairs, they explore replacing them with more energy-efficient models.

Challenges in Implementation: The primary challenge is working with landlords to coordinate sustainability upgrades. As tenants, they lack full control over building systems, requiring close cooperation with property owners. Another challenge is timing, ensuring that energy efficiency solutions are implemented at the right moment, such as when equipment breaks down. This could enhance cost efficiency of different equipment as a consequence. Furthermore, making staff and building users more aware of their energy consumption is an ongoing effort, with initiatives like educational campaigns and reminders to help reduce energy waste.

View on sustainability: Sustainability is deeply integrated into company E's operations and values. The company views sustainability as a social responsibility, extending beyond compliance with regulations. This commitment is not only for environmental reasons but also to enhance employee satisfaction and the broader community. They have implemented sustainability certification processes and rely on external specialists for audits to ensure they meet regulatory obligations.

Company F: Advisory and logistics company

Sustainability team and decision-making process: At company F, sustainability initiatives are coordinated through their facilities management team (consisting of around 10 employees), which oversees both office buildings and large warehouses. The decision-making process for sustainability is driven by the scale of their operations, and they prioritise high-impact, cost-effective measures like upgrading lighting systems and rolling out solar panels. The team works closely with external contractors and energy specialists to implement these measures. However, given the size of their warehouse operations, the sustainability team's efforts focus heavily on energy consumption in warehouses rather than office spaces. Decision-making is pragmatic, focusing on initiatives that offer a clear return on investment while supporting long-term environmental goals.

Energy efficiency measures and compliance with energy label C: As a logistics company, the primary energy efficiency challenges for company C are not only related to office spaces but also to warehouses. The company has addressed energy label C compliance by consolidating smaller, inefficient locations and equipping larger offices with sustainable heating systems, such as wood-burning stoves using waste wood from their operations.

Challenges and measures: For company F, a significant challenge is the scale of their operations. With over 2.5 million square meters of warehouse space, replacing lighting systems alone is a massive undertaking and costs a significant amount of money. The company prioritises "quick wins" by focusing on easily implementable measures such as upgrading lighting systems and gradually rolling out solar panel installations across various locations. They have already installed 4.7 MW of solar panels, particularly at warehouse locations.

View on sustainability: The company adopts an integrated approach to sustainability. Although office buildings only account for 15-20% of the company's energy usage, their broader focus is on electrifying forklifts, cranes, and other heavy equipment, which contribute to over 50% of their energy consumption. Sustainability is embedded in their long-term strategy, focusing on smart energy consumption and reducing peak energy demands through innovative solutions like synchronizing crane operations to lower energy spikes.

Company G: Telecom

Sustainability team and decision-making process: Company G has a dedicated sustainability team responsible for setting ambitious environmental targets, including reducing CO_2 emissions by 95% by 2028. The team is involved in the decision-making for all sustainability-related initiatives. This ranges from office energy efficiency upgrades to the transition of their lease fleet to electric vehicles. Their sustainability efforts extend beyond their office spaces to include their data centres, which account for the majority of their energy consumption. The decision-making process is data-drive. with regular energy audits and environmental assessments to guide future projects. The sustainability team plays a key role in ensuring that all new locations meet energy efficiency standards and is strongly involved and responsible for the decision-making process.

Energy efficiency measures and compliance with energy label C: Company G operates in the telecom sector and operates in various offices. They have been proactive in achieving high energy efficiency standards, with all their offices holding energy labels A or A+. This is part of their broader efforts to reduce their carbon footprint. Their offices are heated with heat pumps, and any new location they move into must meet these sustainability requirements.

Challenges and measures: The main challenge for company G lies not in their offices, but in their vast network of antennas and data centres, which account for 80% of their electricity usage. Reducing the energy consumption of legacy technology while maintaining new technologies, like 5G, is a significant hurdle. Additionally, balancing the increasing demand for data with efforts to lower energy use presents a continuous challenge. However, the main challenge in the energy efficiency measures in their offices is working with landlords in shared buildings, as the company is responsible for certain upgrades, like heat pumps, while the landlords handle other improvements. The cooperation between them and landlords is sometimes difficult because of varying interests on the field of energy efficiency in the offices.

View on sustainability: Sustainability is a high priority for company G, with ambitious goals to reduce their CO_2 emissions by 95% by 2028. They are also involved in innovative projects, such as purchasing energy from wind turbines through Power Purchasing Agreements. These cover a substantial part of their electricity needs. Their long-term vision focuses on electrification as a key method for reducing emissions to zero in the end. This aligns with government targets for sustainability. Additional investments are made in renewable energy and saving energy close to their facilities.

Company H: Law

Sustainability team and decision-making process: At company H, sustainability is embedded into their operations, but the responsibility for building-related sustainability measures lies with the landlord due to the lease agreement. Internally, the facilities management team oversees initiatives like waste management and mobility solutions, such as promoting electric bicycles and public transport use for employees. While the company has a sustainability vision aligned with reducing CO_2 emissions, the decision-making process regarding major building improvements is limited by the lease agreement, which places responsibility for external systems like insulation and heating on the property owner. Interventions made in the building have to be made in cooperation with both the landlord as with the other tenants, therefore the decision-making power is limited for the facilities team at company H.

Energy efficiency measures and compliance with energy label C: Company H is located in a BREEAM-certified building, which means that the building exceeds the energy label C requirement. The company moved into a newly constructed, highly sustainable building in 2020. Sustainability was prioritised from the start of deciding on the new office building. Solar panels are installed on the roof, and energy-saving measures like automatic lighting systems are in place. The previous building, from which they moved in 2017, did not receive sustainability upgrades at the time. This led to the decision to move to a new office building.

Challenges and measures: One of the main challenges for company H is working within the boundaries of their lease agreement. The landlord is responsible for the building's external structure and major systems, while company H manages internal elements like lighting and climate systems. Collaboration with other tenants also plays a role, as the building is multi-tenant. Waste management is another challenge they address by encouraging recycling and aiming to reduce residual waste. They have already implemented systems for waste separation, including plastic, paper, and organic waste.

View on sustainability: Sustainability is embedded in company H's operations, driven by the desire to minimize CO_2 emissions and align with broader initiatives like the * known initiative by the researcher*. They prioritise sustainability in everything from waste management to employee mobility. For instance, they promote the use of electric bicycles and encourage employees to relinquish parking spaces in exchange for more sustainable transport options.

Remark: During this interview I had to explain the EML and audit obligations further, due to a lack of knowledge regarding these regulations. Therefore, some questions were answered more in-depth regarding the other subjects of the interview. The audit and EML usage have been explored in a less comprehensive manner.

Company I: Media and broadcasting services

Sustainability team and decision-making process: Company I does not have a formal sustainability team, but decision-making related to sustainability is handled by the facilities management team in cooperation with external consultants. The team manages energy efficiency upgrades such as LED lighting and insulation improvements but is heavily dependent on landlords for structural changes like heating systems. The decision-making process is somewhat decentralised, with different departments contributing to sustainability initiatives such as waste management and energy savings, while facilities management coordinates major upgrades among the whole width of the company. The company works within the constraints of its rented properties, with decision-making focused on improving what is feasible within those limitations. The facilities team responsible for sustainability consists of 8 employees.

Energy efficiency measures and compliance with energy label C: Company I operates in the media and broadcasting industry, providing services such as filming, production, and broadcasting support for different events. They rent all their properties, which means they rely heavily on their landlords for structural energy efficiency improvements, such as the application for energy label C. However, the company has implemented several measures, including LED lighting replacements and collaborating with landlords on sustainability initiatives. They also pursue ISO 14001 certifications, including for environmental management.

Challenges and measures: The company faces significant challenges in coordinating energy efficiency improvements with landlords, as landlords are often responsible for the outer shell of the buildings. Company I is responsible for managing the internal aspects, such as insulation

and cooling systems. One specific measure they have taken is the installation of sun protection foil to reduce cooling needs during the summer. Their buildings are old, from the 1970s, which complicates insulation and makes large-scale sustainability upgrades challenging.

View on sustainability: Sustainability is a central focus for company I, and they have taken multiple steps to improve their environmental impact, ranging from quick measures like eliminating plastic cups to efforts such as adopting electric vehicles and reducing their overall energy consumption. They are also preparing to meet new regulations that require CO_2 emissions reporting, which will further guide their sustainability initiatives.

Company J: Financial services

Sustainability team and decision-making process: Company J has a sustainability team, which led by a director of sustainability. This person oversees a small team responsible for tracking the company's progress toward environmental goals, such as CO_2 neutrality by 2030. The team conducts regular audits and coordinates with facilities management to implement energy efficiency upgrades like solar panels and LED lighting in the past. Decision-making in company J is structured and data-driven, with sustainability deeply integrated into both the company's operational goals and its broader strategy established by top level management. Facilities management also plays a role in implementing day-to-day sustainability measures, but long-term decision-making is guided by the sustainability team.

Energy efficiency measures and compliance with energy label C: Company J is highly active in the financial sector, managing both rented and owned properties. Their headquarters in * City known by the researcher*, are located in a recently redeveloped, energy-efficient building. However, their owned facility in * a different city known by the researcher* is already equipped with several sustainability features, such as LED lighting and solar panels. The company has eliminated gas usage in its newer buildings and relies on thermal energy storage systems (WKO) to regulate heating and cooling. These efforts have ensured that their buildings meet, and often exceed, the requirements for energy label C.

Challenges and measures: One of the main challenges faced by company J is the discrepancy between marketed energy efficiency claims and actual performance. For example, despite being promised that their building would generate more energy than it consumed, this proved to be untrue in practice, revealing a gap between marketing and reality. Additionally, the company must work within the constraints set by landlords, who sometimes do not share the same level of commitment to sustainability. Nonetheless, company J continues to invest in energy-saving technologies, such as charging stations for electric vehicles, and monitors their energy usage to address discrepancies.

View on sustainability: Sustainability is embedded into company J's strategy. This is the result of both regulatory obligations and an intrinsic motivation to contribute to environmental goals. Their ambition is to become the most sustainable pension insurer in the Netherlands. They have implemented multiple sustainability measures, including electrifying their lease cars and using energy-efficient technologies in their offices. They also recognize the importance of fostering a sustainable work environment for employees, which includes well-being initiatives alongside energy-saving efforts.

Company K: Real Estate

Sustainability team and decision-making process: Company K's sustainability efforts are coordinated by the sustainable development manager, who advises on sustainable building practices across their portfolio. This manager plays a key role in ensuring that all acquisitions and redevelopments meet the company's Paris-proof sustainability targets. However, as tenants in their office building, the company faces challenges in implementing further energy efficiency upgrades, as the landlord is not always open to these suggestions. The decision-making process involves assessing the feasibility of upgrades, such as solar panels and energy-efficient heating, but is often constrained by the landlord's priorities. Due to the size of this company, it is expected that the sustainability 'team' consists of one responsible manager and expert.

Energy efficiency measures and compliance with energy label C: Company K operates from a converted historical building in *City known by the researcher*, which presents certain challenges for energy efficiency. The building, a former car garage, was renovated approximately 10 years ago. While it meets the necessary standards, the building's insulation and climate control systems are not optimal, leading to temperature inconsistencies. Solar panels have been installed to power electric charging stations for lease cars, and there are external blinds to reduce heat from sunlight instead of air-conditioning.

Challenges and measures: A key challenge for company K is the reluctance of the building's landlord to implement further energy efficiency improvements. As a tenant, company K has limited influence over major sustainability upgrades, which hampers their efforts to meet their ambitious Paris-proof sustainability goals. Transparency regarding energy consumption is also limited, making it difficult to track and manage their energy use effectively. Despite these barriers, company K continues to advocate for more sustainable measures, especially in line with their broader goals for sustainable property management.

View on sustainability: Company K's vision for sustainability is focused on making their real estate portfolio as sustainable as possible. They actively incorporate sustainability into redevelopment projects and acquisitions, using tools like the Paris-proof framework to guide their decision-making. The company's long-term goal is to integrate sustainable practices across their entire portfolio, although they face challenges when landlords are unwilling to invest in significant improvements.

Company L: Real estate and energy consultancy

Sustainability team and decision-making process: Company L has a dual focus, advising clients on sustainability measures while also implementing improvements in their own rented office spaces. The company has a pragmatic approach to decision-making, with consultants advising on energy efficiency upgrades based on cost-effectiveness and regulatory requirements. However, since they occupy multiple rented offices, their ability to make major sustainability upgrades is often limited by lease agreements and landlord cooperation. Decision-making is driven by compliance with evolving regulations and a desire to offer sustainable solutions to clients, with internal efforts reflecting the same principles. Internal sustainability teams are not sufficient due to the size of the company, therefore the company has a sustainable manager which cooperates with the landlords for implementing energy efficiency measures.

Energy efficiency measures and compliance with energy label C: Company L provides consultancy services for energy performance in real estate, primarily working with developers and investors. They help clients achieve compliance with energy label C by assessing their properties and recommending necessary upgrades. For instance, they advise on insulation,

heating systems, and other energy-saving measures. The company itself rents office spaces across multiple cities, with their headquarters located in a newly constructed energy-efficient building. However, some of their other office spaces, such as one in an older building, have less advanced energy efficiency features.

Challenges and measures: One of the key challenges faced by company L is working with older buildings where achieving energy efficiency improvements can be costly and technically difficult. They often advise clients on how to make low-cost, high-return investments, such as upgrading HVAC systems or improving window insulation. However, they acknowledge that landlords may prioritise minimal costs and quick payback periods, which can limit the depth of the sustainability measures taken. In some cases, achieving full compliance with modern sustainability standards is not always financially feasible.

View on sustainability: Company L's approach to sustainability is pragmatic and driven by the need to comply with evolving regulations. They help clients navigate the complex landscape of energy efficiency requirements and are particularly focused on ensuring that properties meet the minimum standards, such as energy label C. While cost efficiency remains a major driver for their clients, company L also recognizes the growing importance of integrating ecological and biobased solutions into real estate developments.

Company M: Legal services firm

Sustainability team and decision-making process: At company M, sustainability measures are overseen by the facility services manager, who is responsible for both hard and soft services within the office. There is no separate sustainability team, however the facility manager coordinates with external consultants to meet audit obligations and ensure compliance with energy efficiency regulations providing correct and necessary data and information of the companies energy usage for example. Decision-making is closely linked to operational efficiency, with a focus on cost-effective measures such as LED lighting upgrades and waste reduction. Measures do need to be discussed with high-level management within the company, before implemented. While sustainability is important to the company, the facility manager plays a central role in deciding which measures are feasible. This is especially the case when they involve shared spaces like the parking garage, where collaboration with other tenants and the landlord is required.

Energy efficiency measures and compliance with energy label C: Company M, a law firm, operates from a BREEAM-certified building in *City known by the researcher*, which complies with energy label C requirements. The building already had excellent energy efficiency credentials when they moved in 8 years ago. Over the years, the company has taken additional steps to reduce their environmental footprint, such as implementing a waste separation program and electrifying their lease fleet. However, no major modifications were needed to comply with energy regulations since the building was already built with sustainability in mind.

Challenges and measures: Although company M is housed in an energy-efficient building, one of their challenges lies in aligning further investments in sustainability with cost considerations. Which is not the case for measures like LED lighting upgrades that have short payback periods. The company is in discussions with the building manager and owners about such improvements,

but these are dependent on lease agreements and shared costs with other tenants. Another challenge is navigating shared spaces, such as their parking garage, where collaborative decision-making with other tenants and building owners is required.

View on sustainability: Sustainability at company M is driven more by intrinsic motivation than by regulatory compliance. They view sustainability as an essential part of their broader corporate mission and are committed to continuous improvements, such as reducing their CO_2 footprint. The firm has developed a sustainability policy that aligns with international goals like the Paris Agreement, and they have published a sustainability report that outlines their long-term ambitions. Initiatives like reducing single-use plastics and supporting sustainable travel. are core to their strategy.

4.3 Examples from the transcripts of challenges and findings

The data reveals several key findings regarding the challenges and strategies surrounding energy efficiency efforts in office spaces. Visualising the frequency of some challenges faced is done in Figure 3 below.

4.3.1 Challenges in achieving energy efficiency

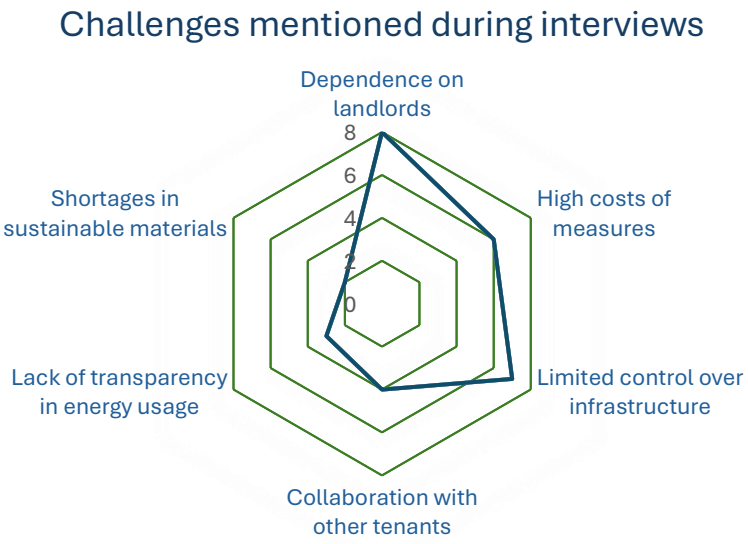

Figure 3: Challenges faced by companies in the research

Financial constraints

The substantial upfront costs associated with implementing energy-efficient technologies remain a primary barrier for many companies, particularly those leasing their office spaces. This challenge was mentioned by five companies across various sectors, including legal services, telecom, and media. The burden of negotiating financial responsibilities with landlords exacerbates the situation. During interview A, the interviewee explained that being a tenant complicates the justification of significant expenses: "*We would like to make these upgrades, but we cannot proceed without landlord approval, and they rarely prioritise such investments unless we cover the costs*". This highlights the dual burden faced by companies, covering the investment and obtaining approval from property owners, which can lead to delays or the abandonment of projects altogether.

Further complicating this issue is the difficulty in justifying these costs without a clear and immediate return on investment. As noted in Interview E, investments like solar panels might be viable for industrial or production facilities but are less so for office buildings where energy consumption levels differ: "*For office buildings, the energy savings don't add up as quickly as they do in industrial settings. The payback period extends beyond what we can justify financially"*. This suggests that companies operating in non-production spaces often struggle to develop convincing business cases for high-cost, high-impact measures, leading them to limit their efforts to more immediate, cost-effective solutions.

Additionally, interviewee B emphasised the importance of quick wins, stating that "*prioritising smaller, immediate-impact upgrades like LED lighting is often necessary because larger investments take too long to recover*". This short-term focus means companies often implement measures with less potential impact, hindering the overall efficiency improvements they could achieve.

The financial constraints result in different effects, which include the following. At first a reduced initiative scope. Organisations often resort to minor upgrades rather than comprehensive solutions due to limited financial flexibility, leading to incremental improvements rather than transformative ones.

The other effect of these financial constraints is the occurrence of project delays. Securing landlord approval and managing the required financial resources often results in long delays, during which energy efficiency gains are postponed. Which automatically results in delays for achieving energy efficiency goals or targets.

At last, the strategies for improving energy efficiency within the company is limited by financial constraints. Companies are forced to align their investments with short-term financial goals, missing out on long-term opportunities for deeper sustainability integration. Companies which did not have issues with financial constraints often had intensive and clear energy efficiency strategies implemented in the companies' long-term policy.

Building infrastructure limitations

Retrofitting older buildings for energy efficiency poses technical and financial challenges that significantly impact companies' ability to implement necessary measures. This challenge was identified by at least four companies. Interviewee I, managing a 1970s building, highlighted how the concrete structure and lack of modern insulation make even basic upgrades like double glazing difficult and costly: "*These buildings are not designed for energy efficiency, and adapting them requires extensive, expensive work*". The prevalence of such cases across sectors underscores a systemic issue with older building stock that cannot easily accommodate modern energy systems without major alterations. There are exclusion grounds for these types of buildings, however less extreme examples are known for the complexity of increasing energy efficiency within the building. Especially in the case of limited financial resources, it could be really difficult to enhance the energy efficiency incrementally with quick wins. Because the infrastructure does not allow quick wins to be as efficient as in more modern buildings.

During interview C, the respondent described the complications associated with aging installations: "*Our systems are at the end of their lifecycle and replacing them with sustainable alternatives is both expensive and technically challenging due to the outdated*

infrastructure". This illustrates a common dilemma, modernising such systems is often technically possible, but the costs and logistical hurdles make it impractical within existing budgets and timelines.

Additionally, company D reinforced the issue by pointing out that while quick wins like replacing TL lighting with LEDs are feasible, the broader challenge lies in dealing with inefficient heating systems: "*Many of our old heating installations are beyond repair and need complete overhauls, but the structural changes required are too disruptive and costly for us at this point*".

The limitations of the infrastructure of buildings creates the following effects.
At first, the high costs of upgrades. Reinforcing or redesigning building components to integrate modern technologies, like heat pumps or advanced insulation, often requires extensive construction, pushing costs beyond what companies can feasibly manage. Secondly, operational disruptions with regard to implementing large-scale upgrades, which usually involves substantial downtime, affecting business operations and discouraging companies from making the necessary investments. Lastly, the limited flexibility of older buildings. These are often restricted in their capacity to accommodate new energy solutions, forcing companies to settle for suboptimal, piecemeal improvements that do not fully address energy inefficiencies.

Dependency on landlords

Dependency on landlords for structural improvements remains a critical barrier for companies in leased office spaces. This challenge was the most frequently mentioned, affecting at least six companies. Many interviewees expressed frustration with the slow pace and lack of cooperation from landlords, who often prioritise rental income over energy efficiency investments. During interview E this dynamic is mentioned: "*Landlords are not incentivised to invest in energy efficiency because they don't benefit directly from the savings. The tenants bear these costs, but we have little say in the building's infrastructure*". This misalignment between tenants and landlords complicates the implementation of sustainable measures, as tenants are unable to unilaterally decide on the necessary changes.

Interviewee I described how this issue is amplified in multi-tenant buildings: "*Coordinating with multiple tenants and a landlord who may not share our sustainability goals adds layers of bureaucracy and delays progress*". This shows that the challenges multiply when several parties, each potentially with different priorities, must negotiate and agree on improvements. Interview D provided further insight into the difficulties posed by changing building ownership: "*Every time a new owner takes over, we have to renegotiate the sustainability measures, and each cycle slows us down*". Negotiating and cooperating with landlords often results in delays in the process and stops the company from transitioning quickly to energy efficient solutions or sustainable improvements.

The effects of landlord dependency include the following possibilities. Prolonged project timelines, which entails the fact that securing landlord cooperation and navigating the necessary agreements takes considerable time, extending the timelines for energy efficiency projects significantly. Due to a lack of autonomy, tenants have limited influence over structural decisions, which can lead to minimal or insufficient changes that do not align with their sustainability targets. At last, the stakeholders do often have conflicting interests. When landlords prioritise rental profitability over long-term sustainability improvements, tenants face

an uphill battle in negotiating comprehensive energy efficiency measures, often resulting in compromises or abandoned projects.

4.3.2 Regulatory compliance as a challenge in achieving energy efficiency

For many companies, compliance with Dutch climate policies, particularly achieving energy label C for office buildings, serves as both a critical motivator and a formidable challenge. Although meeting these standards is a legal obligation, companies also view it as a cornerstone of their broader sustainability strategies. Compliance often requires significant building modifications and sustained investment, which can be difficult to manage, especially for companies with older building stock or those in multi-tenant properties.

The mandate to achieve energy label C is seen as a foundational goal by most companies, shaping both immediate and long-term sustainability efforts. As highlighted during the interview with company H, the decision to move into a BREEAM-certified building reflected this commitment: *"We ensured that the building we moved into was BREEAM[2]-certified, as sustainability and compliance with energy label C were non-negotiable."* This illustrates that compliance with energy regulations has become non-negotiable for many organisations; however, the significant financial and operational commitments required to reach these standards can pose a substantial burden, particularly for companies operating within constrained budgets.

For companies that have already reached energy label C, the focus often shifts towards exceeding regulatory requirements. Compliance is not viewed as a final goal but rather as a baseline for ongoing improvement. As mentioned during interview B, "*We have reached energy label C, but with new CO_2 targets and sustainability audits, we know this is just the beginning*." This evolving perspective reveals how companies increasingly see sustainability as a continuous journey, one that involves regularly adapting to new regulatory demands and environmental targets. However, this dynamic approach to compliance also introduces new challenges, as it requires companies to maintain flexibility and dedicate additional resources to progressively more ambitious sustainability measures.

4.3.3 Challenges in audit and reporting requirements

The requirement for regular sustainability audits and detailed reporting emerged as a significant challenge for many companies, presenting both administrative and financial burdens. Regular audits are a key component of Dutch climate policy compliance, demanding that companies continually assess, document, and improve their energy performance. However, the process of managing these audits introduces considerable complexity, especially for companies with limited internal resources or those operating multiple locations.

Administrative complexity and resource allocation

Regular energy audits demand detailed documentation, coordination, and compliance with standards. Tasks that many companies find challenging to manage internally. As mentioned during interview D: "*We have to ensure that our energy audits are conducted every few years,*

[2]**BREEAM** (Building Research Establishment Environmental Assessment Method) is a widely used sustainability assessment method for buildings. It evaluates environmental performances of buildings across multiple categories, including energy efficiency, water use, health and wellbeing, pollution, transport, materials, waste, and ecological impact. Buildings are awarded certification based on their overall performance, ranging from 'Pass' to 'Outstanding'. In the Netherlands, BREEAM certification is often used to demonstrate compliance with national and European sustainability goals (breeam.com, z.d.).

and the results are used to continuously improve our energy performance. *However, it takes effort to gather all required documentation for complying to the standards*" This quote illustrates the ongoing administrative efforts needed to not only perform audits but also use the results to make iterative improvements. Companies are compelled to allocate staff hours to compliance tasks that could otherwise be directed towards more immediate sustainability initiatives, underscoring the resource-intensive nature of audit compliance.

For companies with extensive facilities, coordinating audits across various sites further complicates compliance. The need to assess each site individually and meet location-specific regulations can increase the workload substantially. This results in an ongoing cycle of audits, reporting, and subsequent adjustments, which demands a dedicated internal team or external consultants. For smaller companies or those with budget constraints, hiring additional compliance staff or contracting consultants represents a financial strain, limiting funds that could otherwise be invested directly in energy-saving measures. The smallest companies in this study did not meet the requirement for the EED audit obligation, which prevented them from challenges.

Financial burden and cost implications

The financial cost of maintaining regular audit schedules adds another layer of challenge for companies, particularly those already facing budget constraints. Many companies expressed concerns over the expenses associated with continuous audits, which include consultant fees, software tools for data tracking, and the operational disruptions audits can cause. For instance, a respondent during the interview with company B mentioned, "*The financial burden of continuous audits is substantial; we're paying consultants not only for the audit but also for the adjustments that need to be made afterward*." This underscores that audit compliance extends beyond simple reporting: it leads to further investments in operational adjustments that result from the audit findings. The goal of audits to improve sustainability in the offices is met via this manner, however the costs of gathering the administrative information, hiring a consultancy and implementing measures is rising as a consequence of the process as a whole.

Moreover, as companies scale their sustainability efforts, the frequency and depth of audits required by regulatory bodies can increase. This creates a compounding financial effect, where companies must continually allocate a portion of their budget to maintain compliance. Companies that manage to implement energy-saving projects based on audit recommendations may see long-term benefits, but the immediate costs can deter those with tighter budgets or minimal flexibility.

Impact on long-term energy efficiency planning

The requirement to meet audit standards introduces complexities that can divert companies from their core sustainability goals. The administrative focus on audits and the associated costs often forces companies to make strategic trade-offs, choosing between compliance and investing in more transformative energy efficiency projects. As a result, companies are sometimes unable to pursue innovative or high-impact initiatives that could reduce energy consumption in the long term. This balance between compliance-driven audits and proactive sustainability efforts remains a significant challenge for many organisations, particularly those operating in cost-sensitive industries.

4.3.4 Internal and cultural challenges in energy efficiency practices

Internal resistance remains a significant barrier to fully integrating energy efficiency practices within companies, as achieving compliance requires shifts in both behaviour and corporate culture. The resistance often arises from employees' hesitation to adapt to new practices that may alter their routines or perceived comfort. For example, during interview A, the interviewee highlighted resistance to energy-saving measures, such as adjusting office temperatures, with employees voicing concerns over comfort levels during colder months: "*Reducing heating was met with complaints, even though it significantly reduced energy use*." Similarly, during interview F noted challenges with employees adapting to new commuting policies, including reluctance to switch from personal vehicles to public or shared transportation.

To address these challenges, companies have implemented strategies aimed at building engagement and aligning employee behaviour with organisational sustainability goals. Several companies launched targeted communication campaigns and training sessions designed to increase awareness and convey the importance of energy efficiency. For instance, by creating visible environmental initiatives like green spaces and recycling stations, companies aimed to integrate sustainability into the daily office experience, fostering a sense of personal responsibility among employees. Companies that provided training programs for their employees. Experienced that this measure helped bridge knowledge gaps and demonstrate the direct impact of energy-saving practices on the company's sustainability performance. To make employees aware created a more supportive environment within the company.

However, the process of fostering a supportive culture for energy efficiency demands significant time, financial resources, and continuous reinforcement. Companies often need to balance internal sustainability objectives with employee preferences, which can create tension. For example, organisations that encouraged sustainable travel options faced challenges when employees preferred cost-effective but less sustainable travel methods. This ongoing need to balance sustainability goals with employee satisfaction and budget considerations highlights the nuanced nature of internal resistance as a challenge to compliance.

4.3.5 Challenges of balancing costs with long-term sustainability

The interviews revealed a common challenge among companies: the difficulty of balancing immediate compliance costs with the anticipated long-term benefits of energy efficiency. Companies in cost-sensitive sectors, such as logistics, real estate, and facility management, frequently cited this tension as a reason for delaying or scaling back sustainability initiatives. For instance, companies that considered upgrading to LED lighting or modern HVAC systems found the immediate costs prohibitive, even though such improvements would eventually result in energy savings and compliance with energy label C requirements.

This financial strain often led companies to prioritise "quick wins" which are the cost-effective, easily implemented measures with shorter payback periods. Approximately 46% of companies in this study, reported choosing these immediate-impact investments over more extensive and costly upgrade. Which does not mean that the companies with more extensive upgrades did not apply quick wins as well. Although these measures contribute incrementally to energy efficiency, they often fall short of transformative improvements. As a result, companies end up implementing only piecemeal changes, postponing the comprehensive upgrades required to meet future regulatory and sustainability targets.

Moreover, in shared office buildings, these financial considerations become even more complex. Multi-tenant arrangements mean that sustainability initiatives often require consensus

among tenants, which can delay decision-making and dilute the effectiveness of individual efforts. In these cases, companies may be limited to incremental improvements that fit within their current budgets, pushing larger-scale upgrades further into the future.

4.4 Key findings from the analysis based on companies' characteristics

In this section, we explore how companies' energy efficiency strategies vary according to their country of operation, size, and the type of space they operate, whether primarily office-based or facility-based. These criteria provide valuable insights into the different approaches companies take in meeting sustainability goals and complying with energy regulations.

4.4.1 Key insights of energy efficiency strategies based on country of operation

An international company in this research is considered to be a company that is operating globally with offices in multiple countries. In contrast, Dutch companies are solely based and operating in the Netherlands. Companies that have an apart department in the Netherlands, which operates under "company name" + "the Netherlands" (like a daughter company) is considered a Dutch company. Based on the interviews and documents provided, the companies are categorised into Dutch and international groups. This distinction reveals significant differences in how they approach sustainability. These differences reflect varying priorities, regulatory environments, and corporate structures, impacting how sustainability goals are integrated into their operations.

Sustainability and energy efficiency focus: national vs. international

Dutch companies focus on national regulatory compliance, as a result of their compliance obligation to national energy efficiency regulations like the minimum energy label C. Their sustainability initiatives are generally pragmatic and cost-efficient. These initiatives focus on achieving quick, practical wins that reduce energy consumption and operational costs. For example, company A has focused on LED lighting installations and waste management, while company C implemented solar panels and heat pumps to meet both regulatory and corporate goals.

On the other hand, international companies adopt a more globalised approach to sustainability. They align their efforts with international standards such as BREEAM certification or pursue ISO 14001 environmental management systems. These companies emphasise corporate social responsibility (CSR[3]) and long-term sustainability investments, such as renewable energy projects and CO_2 reduction goals. For instance, company B operates in a BREEAM-certified building and integrates its sustainability strategy with broader CSR initiatives. These initiatives and policies are often managed broadly over the company, to integrate the same sustainability strategies over departments in different countries.

[3] Corporate Social Responsibility (CSR) refers to the practices and policies undertaken by companies to manage their impact on society and the environment. It emphasises a company's commitment to ethical behaviour, sustainable development, and contributions to economic and social wellbeing. In the context of climate policy, CSR plays a key role in driving businesses to adopt sustainable practices beyond mere regulatory compliance. (Carroll, A., 1999)

Employee engagement

Dutch companies use employee engagement in sustainability as a measure for enhancing their environmental impact and awareness. By encouraging sustainable commuting, waste reduction, and energy-saving behaviours, these companies create a company culture focussing on sustainability. Company G, for example, has implemented a bike-leasing program and incentivises employees to use electric vehicles.

International companies also focus on engaging employees, but their efforts are typically aligned with broader corporate sustainability goals, such as waste reduction programs and CSR initiatives. Company M, for instance, has integrated waste reduction into its employee engagement efforts, contributing to the company's broader sustainability goals.

Decision-making structures

The decision-making processes do not differ significantly between Dutch and international companies. Dutch companies often have a centralised decision-making structure, where facility managers or sustainability managers oversee day-to-day operations within facilities. Senior leadership handles strategic decisions for the longer term, especially the decisions requiring a significant capital investment. For example, company E follows this structure, with the facility manager managing energy audits and compliance, while senior management approves long-term sustainability investments.

Similarly, international companies employ a multi-tiered decision-making process. Local facility managers are responsible for operational decisions at offices. However, the corporate executives make strategic sustainability decisions, particularly for large-scale projects. This structure ensures that sustainability initiatives are aligned with both local regulations and global corporate goals. For instance, company F uses this model, with the energy manager overseeing sustainability efforts in warehouses, while larger investments are approved by senior management.

Common challenges on country of operation

Both Dutch and international companies face distinct challenges in their sustainability efforts. Dutch companies often struggle significantly with landlord cooperation. This limits their ability to implement significant energy efficiency upgrades, such as improving insulation or installing renewable energy systems. Both company A and company I both face this issue, relying on their landlords for structural improvements.

For international companies, the challenge lies in balancing global sustainability standards with local regulatory requirements. These companies often operate across multiple countries, which complicates their ability to maintain a consistent sustainability strategy. Company J, for example, must manage sustainability initiatives across its international offices, where varying local regulations and infrastructure needs create additional complexities. However, they experienced complexities and challenges with their landlords as well.

Table 9: Country of operation-based overview of sustainability strategies and decision-making structures

Aspect	Dutch companies	International companies
Sustainability focus	Local regulatory compliance (e.g., energy label C)	Alignment with global standards (e.g., BREEAM, ISO-14001)
	Pragmatic, cost-efficient initiatives (LED lighting, waste management)	Long-term sustainability investments (renewable energy, CO_2 reduction)

Employee engagement	High focus on engaging employees in sustainable commuting and energy-saving practices	Employee engagement aligned with broader corporate sustainability goals
Decision-making structure	Centralised: Facility managers oversee daily operations, senior management approves strategic decisions	Multi-tiered: Local managers handle operations, executives make strategic decisions
Key challenges	Landlord cooperation limits structural upgrades in rented offices	Balancing global standards with local regulations
	Challenges in scaling sustainability across multiple locations	Managing sustainability across multiple countries

In short, country of operation plays a role in shaping how companies approach sustainability, particularly in terms of their strategic focus and employee engagement. While the decision-making structures, and the challenges they face have similarities. Dutch companies focus on local regulatory compliance and pragmatic, cost-efficient solutions. In contrast, international companies align their strategies with global standards and adopt a more standardised approach to sustainability, often investing in long-term projects that span multiple countries. Which in the case of the regulations that are focussed on in this research, result in early adoption on local regulations. This could be a result of the fact that both internation policy is adopted in local policy as well as efficient corporate strategies. While both Dutch and international companies demonstrate a strong commitment to sustainability, their strategies are tailored to their respective operational contexts and national requirements.

4.4.2 Key insights and differences in energy efficiency approaches based on company size

In this section, the influence of companies' sizes on sustainability strategies, decision-making processes, and the challenges faced by organisations in implementing energy efficiency measures is investigated. Drawing from interviews and documents provided, the commonalities and contrasts between small, mid-sized, and large companies and how their operational capacities shape their approach to sustainability are analysed. In table 10 an overview summarising this section is presented. Showing the insights of the consequences of different company sizes.

Table 10: Energy efficiency complexities per size of company

Aspect	Small (50-1,000 employees)	Mid-sized (1,000-5,000 employees)	Large (5,000+ employees)
Challenges	Limited financial resources for large investments. Reliance on landlords for building upgrades.	Balancing costs with long-term sustainability goals. Reliance on landlords for energy-efficient upgrades.	Managing large infrastructures with complex sustainability needs. High upfront costs for large projects.
Key insights	Focus on quick wins (LED lighting, waste management). Heavy use of external consultants.	Proactive strategies integrated into broader corporate goals. Challenges in scaling initiatives.	Structured sustainability teams: long-term goals like CO_2 neutrality integrated with CSR.

Sustainability approach	Tends to implement small-scale sustainability measures due to financial constraints.	Sustainability is integrated into corporate strategy but struggles with scaling.	Formalised approach with structured teams and a focus on long-term environmental goals.
Decision-making process	Facility manager leads decision-making, often with external consultants guiding decisions.	Facility manager or sustainability manager oversees decisions, with reliance on external audits.	Sustainability manager or dedicated team makes decisions, with input from senior leadership.
Financial resources	Limited budget, leading to prioritisation of smaller sustainability measures.	Moderate resources: can invest in larger projects but must balance with operational budgets.	Greater financial resources, allowing for large-scale sustainability projects like solar or geothermal.
Employee engagement	High engagement, focused on waste management and energy-saving behaviours.	Varied engagement, with efforts focused on sustainable commuting and waste reduction.	Challenges in engaging employees across diverse teams; CSR initiatives used to drive engagement.

Small Companies (50-1,000 employees)

Small companies, face multiple challenges in implementing sustainability initiatives in comparison to mid-size and big companies. A primary obstacle is their limited financial resources. This restricts their ability to invest in large-scale energy-efficient upgrades for the longer term, installing solar panels or upgrading heating systems for example. These high-cost investments are often beyond the financial possibilities of smaller firms. Resulting in the fact that the companies prioritise low-cost, high-impact measures instead. For example, company M focused on smaller sustainability initiatives like LED lighting and waste separation programs rather than embarking on more expensive infrastructure changes. Due to the limitations of financial resources, smaller improvements on energy efficiency are made in a cost-efficient manner.

Another key challenge for small companies is their reliance on landlords for structural improvements to their rented office spaces. Most of these firms are tenants and have limited control over building upgrades. This limits their ability to implement more comprehensive energy-efficiency measures. Company J for example, faced difficulties in convincing the building owner to invest in significant sustainability upgrades. As a sequence of different priorities of increasing sustainability between the stakeholders. Additionally, smaller companies often lack the dedicated sustainability teams seen in larger organisations. Instead, sustainability efforts are typically managed by a facility manager or energy manager who may lack the specialised knowledge required to drive complex sustainability initiatives. Other consequences of these structures could be the broad responsibilities for these functions. The functions are not specifically aimed at energy efficiency or sustainability in these structures, therefore the responsibilities of the facility managers are broad and creates a limited priority, time and aim on energy efficiency in these companies' facilities.

Despite these challenges, small companies tend to focus on quick wins, such as LED lighting upgrades, waste management, and, where possible, small solar panel installations. For example, one company was able to install solar panels to partially meet their energy needs, which was

also cost-efficient. Furthermore, small firms rely on external consultants to guide them through energy audits and regulatory compliance. One exclusion on this finding is company L, which operates as an energy consultancy. This company has the advantage of in-house expertise to guide both its internal sustainability efforts and those of its clients. Other small firms without this expertise depend on external parties for guidance on this topic.

In terms of employee engagement, small companies often leverage their relatively smaller workforce to foster a culture of awareness to sustainability. Company M successfully engaged its employees in sustainability efforts by emphasising waste reduction and promoting the use of electric vehicles, creating a sense of ownership and involvement among staff. This approach allows small companies to maximize their internal resources and create an environmentally conscious workforce, even when financial constraints prevent them from undertaking large-scale infrastructure projects.

Mid-Sized Companies (1,000-5,000 employees)

Mid-sized companies, operate generally at a scale that provides them with more resources than small firms. However, they still face significant financial and operational challenges in implementing sustainability measures. A key difficulty for these firms is balancing the costs of sustainability investments with their long-term environmental goals. For example, company C, faces substantial costs in implementing energy-saving initiatives like heat pumps or solar panel installations. This makes it difficult to balance immediate financial constraints with their longer-term sustainability objectives to electrify their companies' operational activities as a whole.

It is the same for mid-sized companies as for smaller companies. Mid-sized companies are often tenants and must negotiate with landlords for sustainable upgrades in their offices. Company A, for example, has been forced to rely on landlords for significant energy-efficient improvements to their office spaces, such as upgrading heating systems and improving insulation. This reliance on third parties can delay the process and complicate their ability to implement more comprehensive sustainability measures. In addition, mid-sized companies face challenges in scaling their sustainability efforts across multiple locations. Company J has made progress in implementing geothermal energy and electrification of their employees' vehicles at the headquarters. However, scaling these measures across other offices and operations remains a significant challenge.

Despite these challenges, mid-sized companies tend to take a proactive approach to sustainability. By integrating sustainable initiatives into their broader corporate strategies. Company E, for example, has been proactive in conducting energy audits to identify areas for improvement and reduce their CO_2 emissions before the obligation. Demonstrating a commitment to sustainability that goes beyond regulatory compliance at the time. These firms frequently use external audits to guide their decision-making and to ensure compliance with energy efficiency regulations like the audit obligation. Company G relies on external contractors to assess its energy use and recommend improvements, indicating the importance of external expertise in shaping mid-sized companies' sustainability strategies.

In terms of employee engagement, mid-sized firms often vary in their approach. Different companies focus on engaging employees by providing sustainable commuting and waste reduction efforts at the office. whereas others have more limited engagement due to the size and complexity of their operations. Overall, mid-sized companies face challenges in scaling

sustainability initiatives across their entire operations. However, they are generally proactive in integrating sustainability into their corporate goals.

Large Companies (5,000+ employees)

Large companies, have more resources and structured teams dedicated to sustainability. However, they also face unique challenges related to their size and operational complexity. An important issue for these firms is managing large infrastructures and the associated high upfront costs for large-scale sustainability projects. For example, installing solar energy systems or adopting geothermal technologies at the facilities they operate in. For example, company D, has faced difficulties in coordinating sustainability initiatives across its multiple locations due to the complexity of its large-scale operations.

Despite these challenges, large companies are typically able to establish structured sustainability teams that are responsible for driving the organisation's environmental goals. These firms often have dedicated roles, such as sustainability managers or facility managers. These functions are tasked with overseeing energy audits, implementing sustainability measures, and ensuring compliance with regulations. Company B, for instance, uses a structured framework to achieve BREEAM certification to ensure that all new office buildings meet sustainability criteria. However, an interesting aspect of company B was the structure of their internal sustainability team. The facility manager, on his own, is responsible for this part of decision making in cooperation with external partners that apply possible measures. Other companies of this size had larger teams to aim for internal energy efficiency.

In terms of strategy, large companies tend to align sustainability efforts with their corporate social responsibility (CSR) goals. This integration allows them to pursue long-term environmental objectives, such as CO_2 neutrality, while simultaneously enhancing their corporate image and strengthening relationships with environmentally conscious clients. Company D actively engages in CSR reporting, which helps communicate its sustainability achievements to stakeholders. This allows the company to structure their audit obligation in a sufficient manner as well.

Employee engagement is a more complex issue for large firms, as they must engage a diverse and widespread workforce in sustainability initiatives. Company D and Company B both face challenges in ensuring that sustainability initiatives are adopted uniformly across their organisations, as their large size makes it more difficult to foster a sense of ownership and responsibility among all employees. To address this, large firms often use CSR initiatives as a way to engage employees and promote sustainability as part of the company's core values.

In conclusion, company size plays a significant role in shaping sustainability strategies, challenges, and decision-making processes. Small companies often focus on quick, low-cost sustainability initiatives, relying heavily on external consultants for guidance. Mid-sized companies are generally more proactive, integrating sustainability into their corporate strategies, but they face challenges in scaling initiatives and securing landlord cooperation. Large companies benefit from structured sustainability teams and more resources, enabling them to pursue long-term environmental goals, but they must manage the complexities of large infrastructures and ensure employee engagement across diverse teams. Despite these differences, all companies share a commitment to improving energy efficiency and meeting regulatory requirements, although the path to achieving these goals varies depending on their size and resources.

4.4.3 Key insights and differences in energy efficiency practices, office-centric and facility-driven companies

Based on the interviews and documents provided, these two types are investigated on how the companies approach energy efficiency and explore the distinct challenges each faces. This analysis highlights the role of infrastructure in shaping sustainability strategies, as well as the differences in organisational structure and decision-making processes that arise as a result.

For the purposes of this analysis, companies are categorized into two groups: office-centric companies and facility-driven companies: Office-centric companies focus exclusively on energy efficiency and sustainability in their office spaces. Their primary sustainability efforts are directed toward reducing energy consumption through office-based initiatives. Facility-driven companies manage not only offices but also energy-intensive facilities, consisting of warehouses and data centres for example. These facilities significantly expand the scope and complexity of their sustainability efforts. These companies face additional challenges in managing the high energy demands of their large facilities while balancing the sustainability requirements of their office spaces. Their priorities in sustainability are allocated differently in comparison to office-centric companies in this study.

Office-centric companies

Companies:

- A (Recruitment)
- B (Law)
- D (Consultancy)
- E (Consultancy)
- H (Law)
- J (financial service)
- K (Real Estate)
- L (Energy consultancy)
- M (Law)

Focus and sustainability strategy

Office-centric companies primarily focus their sustainability efforts on improving energy efficiency within their office spaces. Key initiatives include the installation of LED lighting, improvements in heating systems, and promoting waste management practices. These companies are generally driven by a need to comply with energy regulations, such as the Dutch energy label C, and they aim to integrate sustainability into daily operations without engaging in major structural upgrades.

However, a significant challenge for these companies is their reliance on landlord cooperation. Many office-centric companies, particularly those operating in rented office spaces, depend on landlords for major building improvements. Examples are upgrading insulation or installing renewable energy systems. For example, company A has limited influence over structural changes to their rented properties, which restricts their ability to pursue more ambitious sustainability goals. Instead, they focus on quick wins, such as the installation of LED lighting and engaging employees in sustainability efforts. These are measures that are within their possibilities of influence.

Employee engagement also plays a critical role in these companies' sustainability strategies. In the case of company M, sustainability initiatives are linked to fostering environmentally

conscious behaviours among employees, such as reducing waste and encouraging the use of electric vehicles. This focus on internal office dynamics allows companies to create a culture of sustainability without needing to invest heavily in structural changes.

Key challenges

A major challenge for office-centric companies is their dependence on property owners to implement structural upgrades. For companies like A and E, this reliance delays significant sustainability improvements and limits their control over energy efficiency measures.
Because office-centric companies typically rent their office spaces, they have limited opportunities to implement large-scale changes, such as installing solar panels or upgrading building insulation. These companies are often restricted to smaller-scale initiatives that can be managed internally.
In the absence of structural improvements, many office-centric companies place a heavy emphasis on engaging employees in sustainability initiatives. Programs promoting waste reduction and sustainable commuting help create an environmentally friendly office culture, even when larger projects are not feasible.

Decision-making structure

The decision-making process in office-centric companies is generally centralised within the Facility Management team. Facility Managers are responsible for overseeing energy audits, ensuring compliance with energy efficiency regulations, and implementing smaller sustainability initiatives, such as LED lighting installations. However, larger strategic decisions, such as investing in renewable energy systems or upgrading office infrastructure, are made by senior management. This two-tiered decision-making structure ensures that day-to-day sustainability operations are handled efficiently, while long-term investments are carefully evaluated at the executive level.

Facility-driven companies

Companies:

- C (telecom)
- F (logistics)
- G (telecom service)
- I (broadcast)

Focus and sustainability strategy

Facility-driven companies operate both office spaces and large energy-intensive facilities, such as warehouses, studios and datacentres. This significantly expands the scope of their sustainability strategies, as they must address not only the energy consumption of their office buildings but also the considerable demands of these additional facilities. For example, company C must balance the energy requirements of its office spaces with the immense power consumption of its datacentres, which are critical to its operations. All the companies with warehouses and datacentres which have a significant surface on the roof, have installed solar panels to reduce energy costs and generate partly their own energy usage. Above that, one company is trying to connect its datacentres to local wind parks in combination with large batteries (which are under development) to become less dependent of the grid. These are significantly different intervention strategies than the strategies applied on solely the office buildings.

The sustainability strategies of facility-driven companies are more complex and typically involve significant investments in energy-efficient technologies. For example, company F has invested in solar panel installations and LED lighting upgrades for its warehouses, while company G has implemented energy-saving measures in both its offices and datacentres. These companies often have dedicated sustainability teams or energy managers who oversee the implementation of energy audits, technical upgrades, and compliance with sustainability regulations. Because of the larger scale of these measures and energy usage, the complexity is large in comparison to companies that operate just in offices. Therefore, it is necessary to have a bigger sustainability team, to ensure the focus on all operations to become more sustainable. Rather than focussing solely on the office or transport.

Key Challenges

A key challenge for facility-driven companies is the high energy consumption of their non-office facilities. Datacentres and warehouses are notoriously energy-intensive, making it difficult to achieve significant energy savings without substantial investment in advanced energy-efficient systems. For example, company G has faced challenges in reducing the energy use of its older datacentres, which consume vast amounts of electricity for cooling. Therefore, different locations require different strategies or tailored interventions. Which are left out of the scope of this research and therefore are not investigated in-depth.

The financial burden of implementing large-scale energy efficiency measures is considerable for facility-driven companies. For instance, company F has made significant investments in solar panels and energy-efficient lighting for its warehouses, but the high upfront costs of these improvements can strain financial resources. However, there are in general more possibilities due to the higher absolute reduction of energy usage and therefore the payback period is often shorter in comparison to measures aimed at offices solely.

Facility-driven companies often face challenges in scaling sustainability efforts across their different types of facilities. While energy-saving measures can be relatively straightforward in office spaces, managing sustainability in warehouses or data centres requires specialised solutions and technology. Therefore, a more comprehensive study is required for improving sustainability in this facilities.

Facility-driven companies typically have a multi-layered decision-making structure. Sustainability teams or energy managers are responsible for overseeing day-to-day sustainability operations, particularly in managing large-scale facilities such as warehouses and data centres. Major investments in energy-efficient technologies, such as installing solar panels or upgrading cooling systems in data centres or studios, are typically approved by senior management, following detailed assessments by the sustainability team. This ensures that both technical and financial considerations are balanced in the decision-making process.

Table 11: Comparison of office-centric and facility-driven companies

Aspect	Office-centric companies	Facility-driven companies
Focus	Energy efficiency in office spaces (e.g., LED lighting, waste management)	Energy efficiency in both offices and large-scale facilities (warehouses, data centres)

Key challenges	Landlord cooperation Limited scope for structural changes Employee engagement	High energy consumption in large facilities Significant financial investment Scaling sustainability efforts across facilities
Decision-making structure	Centralised within facility management; strategic decisions made by senior management	Multi-layered: sustainability teams manage operations, senior management approves large investments

The distinction between office-centric and facility-driven companies significantly influences their sustainability strategies and decision-making processes, which is summarised in table 11. Office-centric companies primarily focus on small-scale energy efficiency initiatives, such as LED lighting and waste management, while relying heavily on landlord cooperation for larger structural improvements. In contrast, facility-driven companies face more complex challenges, as they must manage the high energy consumption of their large facilities, requiring significant financial investments and specialised solutions. Despite these differences, both types of companies share a commitment to sustainability. Though, their approaches and the challenges they face vary considerably based on their operational scope and infrastructure requirements.

4.4 Results of the analysis in conclusion

This chapter analysed the energy efficiency measures adopted by companies in response to the 2023 Dutch climate policy and regulations. Measures taken by companies are derived from interviews with employees of 13 companies who had to commit to these policies. Above the taken measures by the companies, the challenges and culture in companies are investigated. The findings resulted in a range of different approaches and challenges shaped by sector, size, and country of operation. Companies are facing various challenges related to financial constraints, building infrastructure, and external dependencies, such as landlord cooperation.

The analysis shows that compliance with Dutch energy efficiency regulations drives companies to include and prioritise sustainability in their strategies. The regulations, combined with societal pressure, stimulate businesses to implement measures that optimise energy usage and reduce CO_2 emissions. However, many companies pursue ambitious goals beyond the regulatory requirements. Some even pursue achieving carbon neutrality from 2030 on. The compliance and exceeding of compliance with energy label C is an example of the active stance of Dutch companies to sustainability.

The interviews reveal that the main challenges are financial constraints and reliance on external parties, such as landlords. This dependency limits their ability to implement large-scale energy upgrades and often delays their sustainability efforts. Additionally, the administrative burden of audit obligations and using the recognised measures list (EML) adds complexity. Resulting into companies relying on external experts for designing actions to comply to regulations. The recognised measures list was often considered as vague and too specific.

Characteristics of companies, for example sector, and operational context significantly influence their sustainability strategies. Smaller companies tend to focus on cost-effective measures and quick wins, while larger organisations aim for long-term strategies and more structural improvements. However, these advantages for larger organisations should be interpreted cautiously. Factors could have some influence, for example the greater access to

financial resources and lobbying power often provide advantages that may not necessarily reflect higher efficiency or deeper commitment to sustainability for larger companies. These dynamics will be explored further in section 5.4.6. . Furthermore, the reliance on external parties, such as landlords, underscores the need for greater collaboration and support to meet the goals set by Dutch climate regulations.

Overall, the findings of this research suggest that while Dutch climate regulations act as a catalyst for companies to adopt energy efficiency measures within their offices. The extent and effectiveness of these efforts vary widely based on the previous mentioned organisational characteristics. The dependency on external parties, particularly landlords, poses a significant recurring barrier. This emphasises the need for more collaborative and supportive frameworks to facilitate cooperation between stakeholders. Despite these challenges, the commitment of many companies to exceed regulatory requirements and embed sustainability into their corporate culture and long-term strategies is a positive sign. This suggests that with the right incentives and partnerships, companies can make substantial progress towards meeting and even surpassing national sustainability targets.

5 Discussion

This chapter synthesises the research findings within the broader context of Dutch climate policies and corporate energy efficiency practices. It highlights the interplay between regulatory compliance, organisational behaviour, and the inherent limitations of these practices. The chapter reflects on the implications for policymakers and businesses and provides targeted recommendations to address future challenges and support adaptive energy efficiency policies. The aim is to present a comprehensive understanding of what these findings mean for the future of energy efficiency in office buildings for companies.

5.1 Overview and contextual analysis of key findings

This study investigates how Dutch office-based companies respond to climate-driven energy efficiency regulations, specifically focusing on compliance with the energy label C requirement, the energy savings obligation, and the EED audit obligation. Through a qualitative analysis, it becomes clear that for different companies in this research, regulatory compliance serves as a minimum operational standard rather than a strategic approach to energy management. These findings align with previous research, which argues that when regulatory requirements can stimulate initial action, they frequently lack the ability of fostering a culture of continuous improvement (Jaffe &Stavins, 1994).

The findings indicate that organisational characteristics, such as size, sector, and internal resources, significantly shape responses to energy efficiency regulations. Larger companies, with more resources, are more likely to integrate energy efficiency within long-term planning and align compliance with broader corporate goals. In contrast, smaller companies, are often constrained by limited budgets. These companies view compliance as an additional cost and tend to pursue only basic regulatory requirements due to a lack of resources. They tend to aim for quick wins, without investing in more ambitious sustainability initiatives for continuous improvement over the longer term. In this research, this is often a result of lack of possibilities within their budget, rather than the fact that these companies do not want to improve beyond compliance. This is opening an opportunity for improvement in the Dutch policy for stimulating energy efficiency within smaller companies with less financial resources.

Sector-specific motivations also emerged as a key differentiator, with energy-intensive companies, where energy costs significantly impact operational budgets, often viewing energy efficiency as a cost-saving measure. This aligns with findings from previous research (Porter and van der Linde,1995) which emphasise that firms with energy-intensive operations are naturally inclined to prioritise efficiency measures that yield both economic and environmental benefits.

By contrast, office-based sectors with inherently lower energy demands tend to implement minimal compliance measures without engaging in deeper, long-term sustainability strategies. These sectoral variations suggest that a nuanced, tailored approach to regulation could yield more effective results, ensuring that industries with diverse operational and financial priorities can contribute meaningfully to national energy efficiency and sustainability goals.

Overall, while Dutch regulatory frameworks effectively encourage initial compliance, the regulations fall short in incentivising integrated energy management practices. The study suggests that more flexible policy mechanisms are needed to go beyond basic compliance, encouraging companies to adopt voluntary energy management practices. Aligning regulatory

incentives with corporate financial priorities could bridge the gap between regulatory mandates and proactive energy strategies, positioning companies to adopt energy efficiency as a strategic objective (Eichholtz et al., 2010).

5.2 Broader implications for the energy transition and corporate energy efficiency

The findings of this study contribute not only to an understanding of corporate adaptation to energy efficiency regulations in the Netherlands, but also to the broader discourse on the energy transition and corporate responsibility in energy efficiency and sustainability. The office sector, while less energy-intensive than other industries, represents a significant portion of building-related emissions and due to prominent locations of large buildings, these companies have an example role for other sectors (Eichholtz et al., 2010). Consequently, the effective reduction of emissions within this sector is essential for achieving national climate goals. However, the findings in this study suggest that a compliance-centric approach constrains the full potential of corporate contributions to sustainability, with minimal adherence often taking precedence over proactive and long-term energy strategies (Staw, 1981). This implies that current regulatory frameworks may need recalibration to better engage companies in the energy transition (Jaffe & Stavins, 1994).

5.2.1 Financial barriers and policy solutions

For meaningful corporate participation, financial support mechanisms are crucial. Many smaller companies and tenant-based organisations face substantial financial barriers when attempting to comply with or exceed regulatory requirements. Initial investments in energy-efficient technologies keep companies off significant improvements (in heating or insulation for example) due to limited budgets. Expanding accessible financial options, such as tax incentives and subsides could alleviate this barrier, which is in line with previous research (Jaffe & Stavins, 1994). Allowing a broader spectrum of companies to invest in impactful energy measures. Providing targeted financial structures for smaller organisations can enhance engagement with sustainability goals across diverse business types and sizes. Such financial mechanisms could be useful for embedding energy efficiency as a manageable and strategic priority for resource-constrained companies.

5.2.2 Split-incentive dilemma

Moreover, the research underscores the structural dependency on landlords faced by many tenant organisations. This dependency creates a split-incentive issue, where tenants bear the energy costs of inefficiencies but have limited control over structural improvements. While landlords, who bear upgrade costs, have limited incentive to invest in improvements. This split incentive not only restricts tenants' ability to make efficiency improvements but also delays collective progress on energy efficiency targets across multi-tenant properties (Schaltegger et al., 2022). Previous research argues that policy interventions such as green lease agreements, which formalise shared energy efficiency responsibilities between tenants and landlords, are useful for a smooth transition and long-term energy efficiency strategies (Gillingham et al. ,2012).

5.2.3 Strategic engagement beyond compliance

The results also indicate that viewing energy efficiency as a mere compliance task may hinder broader participation in the energy transition. While regulations provide a necessary baseline, they do not always foster the intrinsic motivation needed to view energy efficiency as a strategic

asset. Porter and van der Linde (1995) argue that effective regulatory frameworks should support continuous improvement, with incentives for companies that aim beyond basic compliance. The results of this study suggest that such a framework could encourage companies to adopt sustainability practices that extend beyond minimum regulatory requirements, driving long-term environmental benefits and reinforcing a proactive corporate role in the energy transition (Takacs & Borrion, 2020).

The broader implications of these findings for the energy transition are significant. Achieving climate targets at both national and EU levels necessitates a comprehensive strategy that integrates regulation, financial incentives, and cultural shifts within organisations (Dunlop & Völker, 2023). Policymakers and industry stakeholders should recognise that compliance alone is insufficient to drive the energy transition effectively. Instead, policies should foster an environment where voluntary energy efficiency initiatives are encouraged and rewarded, allowing companies to view sustainability and energy efficiency as strategic objectives rather than regulatory hurdles.

In conclusion, this study underscores the importance of adaptive policies, collaborative frameworks, and financial mechanisms that empower companies to align energy efficiency with strategic priorities. Such alignment not only supports compliance but also positions organisations as contributors to a resilient, low-carbon economy.

5.3 Limitations of the research

The limitations of this research can be grouped into sample composition and generalisability, methodological limitations, temporal limitations and regulatory recency, context-specific limitations, and external confounding factors. Addressing these limitations clarifies the boundaries of the conclusions from the research and situates the findings within the broader landscape of energy efficiency research.

5.3.1 Sample composition and generalisability

In this research interviews have been conducted at 13 companies from different sectors such as real estate, legal services, and consulting. This process allows for in-depth qualitative analysis. However, this limited sample size restricts the generalisability of the findings to the broader corporate landscape and other companies. A larger, more diverse sample would strengthen the reliability of the results and reveal sector-specific patterns in energy efficiency practices that may not be captured in an analysis of the sample size in this research.

The current sample may not fully represent differences in company size, budget constraints, and geographic factors that influence regulatory compliance. For instance, smaller firms often lack the sustainability resources available to larger organisations, impacting their compliance strategies. Additionally, regional factors within the Netherlands, such as building age, urban density, and landlord dynamics, could affect how companies approach energy efficiency. This study focused on companies in similar regions, limiting the geographic scope.

Overall, while the research provides valuable insights into sector-specific responses to Dutch climate policies, caution is needed when generalising these findings to other sectors or organisational contexts not represented in the sample.

5.3.2 Reliance on semi-structured interviews

In this research, semi-structured interviews have been conducted to capture in-depth, qualitative insights into corporate energy efficiency practices and responses to regulatory demands in the Netherlands. This method allowed for flexibility, enabling participants to share detailed accounts of their specific experiences and organisational approaches. However, the reliance on semi-structured interviews introduces limitations related to subjectivity and role-specific biases. For instance, sustainability officers might prioritise environmental goals and regulatory challenges, while financial managers are likely to focus on cost constraints. This potentially skews responses based on personal perspectives and departmental agendas.

Furthermore, the interpretative nature of qualitative analysis means that responses could be influenced by the researcher's biases during data collection and interpretation. While steps were taken to maintain neutrality and consistency, inherent subjectivity remains a limitation. The potential for response bias is also notable, as participants may present their companies in a favourable light, particularly when discussing sustainability practices. This social desirability bias could impact the authenticity of the data, especially in an era where sustainability is highly regarded in corporate discourse.

These methodological constraints imply that while the qualitative data offers deep insights into specific organisational strategies, the subjective nature of interviews means that findings should be contextualised within the limitations of qualitative research methodologies.

5.3.3 Temporal limitations and regulatory recency

The research focused on recent regulatory developments, including the energy label C requirement and the EED audit obligation, which have been implemented recently. This means the findings capture companies' initial reactions and early-stage strategies for compliance, rather than long-term adaptations or integrated energy management practices. Given the early-stage nature of compliance efforts, the results likely reflect short-term, cost-effective measures, LED lighting or thermostat adjustments for example, rather than significant organisational change. The structural changes and consequences of the regulations are probably not captured yet in this research.

The study's cross-sectional approach limits the ability to observe whether initial strategies evolve into more sophisticated and integrated energy practices over time. Organisational adaptation to regulatory requirements is an iterative process that can evolve significantly as companies gain experience and adapt to new operational norms. Without the required longer-term data, the research may not capture shifts toward strategic, long-term energy efficiency initiatives or the potential institutionalisation of sustainability as an organisational value.

This limitation emphasises the importance of viewing the findings as a snapshot of current practices rather than a comprehensive analysis of long-term corporate strategies in response to regulatory policies regarding energy efficiency in general.

5.3.4 Limited scope: focus on Dutch climate policies

This study focuses exclusively on Dutch climate policies, examining compliance with the energy label C, energy savings obligation, and EED audit obligation within the Netherlands. While the Netherlands serves as an insightful case study due to its ambitious climate policies and regulatory framework, the findings are inherently constrained by this geographic and policy-specific context. The specific elements of Dutch policy, including strict building

standards and incentives for energy efficiency measures, shape corporate responses in ways that may not fully apply to companies in other European Union countries or around the globe.

Comparative research across countries with similar energy efficiency regulations, such as Germany or France, could reveal whether the challenges and motivators identified here are widely experienced or specific to the Dutch regulatory landscape. While EU nations share overarching climate goals, their policy implementations vary significantly. The specific nature of Dutch energy regulations, including particular incentives for renewable energy adoption, may lead to corporate behaviours that differ from those in countries where regulations or market structures are less stringent. As a result, while the research contributes to understanding how companies navigate the Dutch regulatory landscape, caution should be taken when applying these insights internationally.

5.3.5 Power dynamics and stakeholder perspectives

Another key limitation of this research lies in its focus on corporate perspectives. This results in leaving out the views of other important stakeholders, for example regulators, landlords, and policymakers. This one-sided approach limits the ability to capture the broader dynamics of regulatory compliance as a whole. In specific, the influence of power asymmetries. For example, larger companies often wield more lobbying power. This could possibly enable them to influence regulatory frameworks in ways that align more with their operational capacities and strategic priorities. On the other hand, smaller firms often encounter financial and operational constraints that can hinder compliance efforts. Therefore a nuance should be kept in mind while interpreting the results from the research.

Moreover, the lack of triangulation highlights another limitation of this research. Without corroborating corporate claims through quantitative data, external audits, or third-party evaluations, there is a risk of overestimating the reported effectiveness of sustainability practices. Future research could aim to fill these gaps by including diverse stakeholder perspectives and adopting mixed-method approaches to strengthen the reliability and depth of findings.

By recognising these power dynamics and methodological constraints, this research places its findings within a specific context. It also underscores the importance of further investigating the interplay between corporate strategies, regulatory compliance, and the influence of multiple stakeholders.

5.3.6 COVID-19 as a confounding factor

The study does not specifically evaluate the impact of the COVID-19 pandemic, but its influence on corporate practices during the research period is significant. The pandemic prompted budget reallocations, shifts in strategic priorities, and fast adoption of remote work. This has potentially shifted the attention from long-term sustainability investments to immediate operational needs.

The move to remote and hybrid work models also altered energy consumption patterns and office space use, which may affect the accuracy of the findings when compared to pre-pandemic strategies. These shifts could change how companies prioritise energy efficiency measures, and the long-term effects remain uncertain. Understanding these external influences highlights the importance of recognising that the study's conclusions are drawn within a unique and unprecedented period, which may not fully represent future regulatory responses or sustained corporate practices for other periods.

5.4 Implications for businesses and policy recommendations

This study provides practical insights for businesses and policymakers, emphasising strategies for overcoming barriers to compliance and advancing sustainable energy practices in the corporate sector. Addressing the core challenges identified: financial constraints, landlord dependencies, and sectoral variances, this section proposes actionable recommendations to support companies in their journey from compliance to proactive energy efficiency.

5.4.1 Enhanced stakeholder collaboration for tenant companies

The dependency on landlords for structural upgrades emerged as a critical barrier to achieving energy efficiency in leased properties. Tenant companies often lack the autonomy needed to implement energy improvements, as landlords are typically focused on rental yields rather than operational energy costs. One practical solution is the adoption of standardised green lease agreements that define shared responsibilities and align energy goals between landlords and tenants. Green leases provide a structured framework for cost-sharing on energy upgrades and promote cooperative sustainability efforts within multi-tenant buildings (Schaltegger et al., 2022). Policymakers could support the adoption of green leases by incentivising landlords through tax reductions or subsidies to improve energy efficiency within the facility. These incentives could encourage property owners to invest in significant improvements in sustainable infrastructure, leading to benefiting both landlords and the companies that rent their offices.

In addition to standardised lease agreements, improved communication channels between tenants and landlords are important for effective collaboration between the stakeholders. A proactive dialogue on shared sustainability goals can enhance and fasten decision-making on energy efficiency upgrades. To ensure that both parties recognise the mutual benefits of a greener and more efficient building. By maintaining a cooperative approach to energy management, companies can reduce delays in implementation and promote a more unified commitment to sustainability across the building's stakeholders. This could be other renting companies or the property owners.

Addressing the challenges faced by SMEs requires an adaptive regulatory approach. Consistent with Fairman and Yapp's (2005) findings, SMEs in this study exhibited limited internal capacity for compliance and relied heavily on external parties for guidance. Gunningham's (2009) framework suggests that incorporating user-friendly tools and targeted incentives can bridge this gap. For example, simplified reporting processes and sector-specific support programs could alleviate the administrative and financial burdens that disproportionately impact smaller firms.

5.4.2 Financial support and incentivisation to overcome cost barriers

Financial constraints, specific for smaller companies and companies in non-industrial sectors, are a barrier to implementing energy-efficient upgrades. To address this, a more targeted financial support system is required. This targeted system should offer sector-specific grants, low-interest loans, and tax incentives that align with the unique needs of diverse different companies. Policymakers could design sector-specific grants, low-interest loans, and tax incentives that could adapt to the varied financial capabilities of businesses. The time and effort to structure tailored support could be a disadvantage for policymakers in the short term, however in the long-term sustainable targets could be met.

Adjusting financial assistance tailored to specific industry needs to acknowledge the different energy demands and operational cost structures across different operational sectors. For example, office-based companies might benefit from incentives focusing on efficient lighting systems, HVAC improvements, and better insulation. Which is in line with the research of Felgueiras et al. (2016), which emphasised the importance of sufficient HVAC in sustainable buildings. These targeted incentives can turn energy efficiency from an operational expense into a strategic investment for office-based companies. While other sectors have different needs for increasing energy efficiency in their day-to-day operations, such as transporting vehicles or datacentres.

Targeted incentives for landlords can be implemented through tax rebates, low-interest green loans, and green lease agreements. Tax rebates could offset the cost of sustainable upgrades, while government-backed green loans reduce financial barriers by offering favourable repayment terms linked to energy savings. Green leases, where tenants share the cost and benefits of energy-efficient measures, align the interests of both parties and address the split-incentive dilemma. Certification programs recognising landlords for sustainability efforts can enhance energy efficiency within properties, and partnerships with energy service companies (ESCOs) can offer turnkey solutions and minimising upfront costs. Together, these mechanisms provide a direction for encouraging landlords to invest in energy efficiency while fostering collaboration between landlords, tenants, and policymakers.

Implementing a system of sector-specific incentives would also recognise that the costs and benefits of energy efficiency vary widely depending on industry type and operational energy intensity. By making high-impact upgrades more accessible, companies can approach energy efficiency as an investment rather than a financial burden. The alignment of financial incentives with sector-specific needs, suggests that adaptive financial structures promote broader participation in sustainability initiatives. Investigating adaptive financial regulations could help policymakers achieve the desired outcomes of climate policy.

5.4.3 Building internal capacity and cultivating an energy-conscious culture

To transition from compliance-focused practices to a proactive sustainability approach, companies need to invest in internal capacity-building and foster an energy-conscious culture. As the findings of this study highlight, organisational scale and resource availability heavily influence the ability to implement comprehensive energy policies. For companies with limited resources, developing energy management competencies within the existing workforce can bridge some of these gaps.

First, implementing internal training programs equips facilities and operations teams with the expertise to identify energy-saving opportunities, manage energy usage, and ensure continuous compliance with regulations. This reduces reliance on external consultants and embeds energy efficiency as a core organisational competency.

Educating employees at all levels on energy-efficient practices, for example mindful energy use, temperature optimisation, and waste reduction, creates a sense of collective responsibility. This could be enhanced by organising regular awareness campaigns, feedback loops on energy-saving progress, and incentives for energy-conscious behaviour within the company. These further entrench energy efficiency practices within the corporate culture. This transformation supports long-term sustainability and positions energy efficiency as an ongoing strategic priority rather than a regulatory checkbox or obligation.

To support the transition from compliance to proactive energy efficiency, a structured framework has been developed. This framework provides a step-by-step iterative framework for companies to implement sustainable energy practices aligned with current and future regulations. The next section presents this framework, offering practical steps for enhancing corporate energy strategies and fostering continuous improvement.

5.5 Framework for companies for future energy efficiency policy

This framework breaks down the essential steps for companies to design, implement, and sustain energy-efficient practices in alignment with future Dutch climate policies that focusses on energy efficiency in companies. Developed from this research' key findings, the framework addresses specific challenges companies face. For example: regulatory compliance, financial constraints, and reliance on landlords. It's structured to address both compliance and proactive sustainability initiatives, organised into six key stages which will be presented in this chapter. An overview of this circular six-step framework is presented in Figure 4. It is a framework which could be used when designing both strategies to comply with regulations on the short term as well as long term energy efficiency strategies.

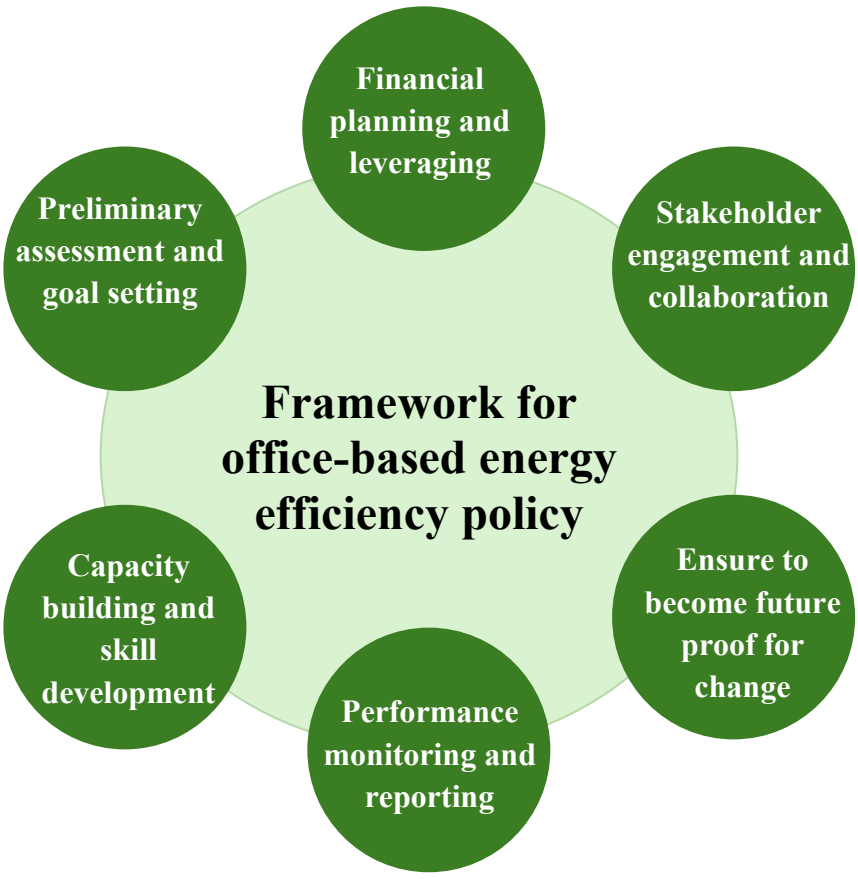

Figure 4: framework for companies to enhance their approach on energy efficiency within their offices and strategies

This framework is designed to guide companies through a comprehensive and adaptable approach to energy efficiency and sustainability within their operations and buildings. The framework balances regulatory compliance with long-term sustainability goals. The framework

is based on the principles of adaptability, feasibility, and stakeholder alignment. While providing a structured and flexible roadmap for achieving energy efficiency in a multi-actor context where most of the included companies operate in.

The framework consists of six interrelated phases. Each phase addresses a specific aspect of energy efficiency planning and implementation. While the phases are presented in sequence, the process is iterative, with feedback loops ensuring continuous improvement. By engaging diverse stakeholders, this framework ensures collaboration and shared responsibility in the approach towards energy efficient offices. Companies are encouraged to adapt the framework to their specific needs, integrating it into their strategic planning cycles for improved impact in their energy usage.

Phase 1: Preliminary assessment and goal setting

The research indicates that regulatory compliance often serves as an operational threshold but does not establish a foundation for continuous improvement in energy efficiency practices within companies. Companies tend to treat compliance as a separate activity without embedding it within strategic planning (see findings on organisational size and compliance approach) Designing an effective energy efficiency policy starts with a detailed assessment of the current energy usage of a company. This initial assessment allows companies to determine areas for improvement. Above that, the assessment makes it possible to establish clear targets for energy efficiency. Based on the results, companies can set energy efficiency targets on short- and long-term timeframes. Ambitious targets are particularly beneficial for companies aiming not only to comply with current regulations, but also to prepare for future regulations. Setting these targets in an early stage, results into companies avoiding high costs of rushed upgrades when new regulations will be implemented. This phase serves as the starting point but remains a recurring step in the cycle. As monitoring and stakeholder feedback provide new insights, companies may return to reassess their energy usage and adjust targets.

To implement this phase actively, companies should begin by organising stakeholder workshops that include landlords, tenants, energy managers, and financial officers. To ensure information symmetry among the relevant stakeholders. Use the sessions to collect insights on shared challenges and goals, ensuring that all parties are aligned on the importance of energy efficiency within the property. This is possible to realise by using energy audit software and benchmarking tools to assess the current energy usage. Share findings in a visual format to make the data actionable for all stakeholders. It is important to simplify the findings to ensure that all stakeholders understand important insights of the results. Allocate 2–3 months for the preliminary assessment and collaborative goal setting. Ensure that landlords are part of these discussions to establish a commitment to shared energy objectives and make them aware of (long-term) advantages of energy efficiency improvements.

Phase 2: Financial planning and leveraging incentives

Financial planning is critical for aligning budget allocations with compliance needs and for realising energy-saving measures. Findings from this research reveal financial barriers, especially for smaller companies with limited budgets. These barriers hinder investments in energy efficiency upgrades. Smaller companies are more likely to view compliance as an added cost, which limits their capacity to pursue proactive energy efficiency measures. Phase 2 addresses this by emphasising the importance of allocating financial resources and determining incentives for energy efficiency. Sufficient strategic financial planning ensures that energy efficiency efforts align with a company’s budget. A dedicated budget for both

compliance and voluntary energy-saving projects clarifies financial limits and guides decision-making. Companies should actively seek available financial incentives, such as subsidies, tax breaks, or green financing options, to offset the costs of significant upgrades. For companies dealing with landlords, negotiating shared-cost agreements can address the often experienced "split incentive" issue. Via this intervention, it realises that energy investments are mutually beneficial. Financial planning is not a one-time activity: it evolves as companies identify new incentives or adjust budgets based on performance monitoring and stakeholder negotiations.

To address these financial challenges, developing green lease agreements can help distribute costs and benefits fairly between tenants and landlords. These agreements should emphasise mutual benefits, such as higher property value for landlords, reduced operational costs for tenants, and a lower environmental impact overall. Specific clauses in these agreements can outline cost-sharing mechanisms. For example, splitting investments based on projected energy savings or linking landlord contributions to available tax incentives. Structured negotiations between tenants and landlords can further align objectives and build trust. Additionally, government subsidies or tax benefits targeted at collaborative energy upgrades could incentivise landlords to actively participate in energy efficiency measures.

Companies should also consider forming dedicated financial teams or working with external consultants to identify and secure funding opportunities, such as subsidies, grants, and low-interest green loans. These teams could develop case studies showcasing the return on investment (ROI) from previous energy efficiency projects to strengthen stakeholder buy-in. By integrating these financial strategies, companies can effectively overcome barriers and align budgets with their energy efficiency goals. While specific case studies may not be readily accessible, the adoption of green leases in the Netherlands illustrates a collaborative approach to improving energy efficiency in buildings, benefiting both landlords and tenants.

Phase 3: Stakeholder engagement and collaboration

The research shows that tenant-landlord dependencies complicate energy efficiency efforts, especially for tenant-based companies. With landlords often bearing upgrade costs but tenants paying operational expenses, companies face structural dependencies that restrict their ability to act on energy efficiency independently. A successful energy efficiency strategy requires all relevant stakeholders to be involved. Tenant companies should establish strong communication channels with landlords and property managers. This allows them to coordinate on structural energy improvements and renewable energy projects in their operations and buildings. Internally, transparent communication about energy goals engages employees and fosters collective accountability. For example: designating “sustainability heroes” to lead by example can further reinforce a culture of shared responsibility and proactive energy management. Stakeholder collaboration is a continuous process that interacts with all other phases in the framework. This ensures alignment on energy strategies and fostering adaptability to new goals and regulations.

Effective collaboration with landlords starts with proposing joint investment strategies, backed by clear data on the benefits of energy-efficient upgrades. Presenting case studies or ROI projections can help secure landlord participation. Internally, forming a task force that includes representatives from sustainability, operations, and finance teams ensures coordinated action. Assigning “Energy Champions” among employees to lead sustainability initiatives creates a sense of ownership and accountability. These champions can host regular information sessions and share energy-saving tips tailored to the office’s needs. Stakeholder

collaboration should be revisited biannually to adjust strategies based on feedback and evolving goals.

Phase 4: Capacity building and skill development

The study underscores the influence of organisational size on energy efficiency practices, with smaller firms often lacking dedicated sustainability staff and resources to pursue proactive strategies. Building internal expertise is crucial for effective energy management and for reducing reliance on external consultants. Companies should invest in training programs for facilities and operations teams, empowering them to identify and implement energy-saving measures independently. Educating all employees on sustainable practices, such as efficient energy use and waste reduction, encourages behavioural changes that support the organisation's energy goals. Tools that monitor and display energy consumption can reinforce these efforts by demonstrating the tangible impact of individual and collective actions. Capacity building is a recurring effort, with training programs updated based on insights from monitoring and emerging technologies. This ensures that teams remain equipped to handle evolving energy efficiency needs.

This could be enforced by companies by partnering with energy consultants to provide workshops on identifying and implementing energy-saving measures. Incorporate interactive tools, such as energy monitoring dashboards, to engage employees. To structure this approach it would be recommended to conduct quarterly training sessions and include energy efficiency goals in performance appraisals to reinforce accountability and interest of employees into the subject.

Phase 5: Performance monitoring and reporting

Results indicate that companies frequently lack structured metrics and evaluations for monitoring energy progress, making continuous improvement difficult. Without robust performance tracking, companies tend to meet minimum compliance without deeper engagement. Long-term success in energy efficiency depends on clearly defined metrics and regular evaluations. Key Performance Indicators (KPIs), such as energy usage per square meter, provides measurable benchmarks for tracking progress of improvements. Regular audits and reports help identify problems and keep energy strategies aligned with new regulations. Companies that work with consultants should ensure that knowledge transfer is prioritised, so internal responsible teams or employees, gain the expertise needed for ongoing compliance and energy efficiency management in the company. Transparent reporting builds trust among stakeholders and showcases the company's commitment to sustainability to the outside world. Monitoring and reporting are central to the circular process, providing data that informs reassessments, financial adjustments, and renewed stakeholder collaboration.

It is recommended for companies to invest in monitoring measures such as smart meters and IoT-based monitoring systems to collect real-time energy data. These insights are relevant and necessary to use for identifying underperforming areas and adjust strategies dynamically to improvement areas. Above that, it is important that performances are measured after implementation. To be transparent and present findings and improvements, publishing annual energy reports to present progress to external stakeholders, including clients and regulators is recommended. By presenting findings in annual reports or LinkedIn could result in extra marketing and an improved sustainability record to attract new investors or clients. At last, to improve continuously, monthly performance reviews and an annual reporting cycle are recommended to evaluate and refine strategies.

Phase 6 Future proofing for regulatory and technological change

The continuous development of regulations and technology results in one important characteristic for every energy efficiency strategy. This is adaptability, which is the key to success, due to the fast-changing dynamics in the energy efficiency policies and technology. Designing strategies that are flexible enough to accommodate future changes allows companies to keep pace with new regulations or shifts in operational scope. The study's results highlight the advantage of proactive strategies over compliance. By anticipating regulatory shifts and adopting emerging energy solutions, companies can maintain efficiency improvements and structure it on the long term in a financial sustainable manner. Staying informed about emerging technologies enables companies to explore solutions that could enhance efficiency or reduce costs over time. Establishing audits, allows the company to adjust targets and continuously improve its approach to energy efficiency in their operations. This proactive strategy not only realises regulatory compliance but also positions the company as a leader in sustainable innovation. Futureproofing is not the conclusion of the process but a continuous thread running through all phases, influencing how companies plan, implement, and adapt their energy strategies. Future proofing initialises the previous mentioned phases by adapting and embedding modern technologies into policies or strategies.

To realise this adaptive approach, companies could take the following approaches or actions. The first is to use predictive analytics and scenario models to assess potential future regulations and energy demands. To use these insights, it helps to design flexible budgets that allow for quick adjustments to new requirements. Above that, exploring partnerships with tech providers for pilot projects, such as AI-driven energy optimisation or partnerships with more energy focussed companies or building companies that could help with deciding and implementing advanced HVAC systems, energy saving measures and long-term strategies for buildings. Knowing what the newest developments are in insulation and technologies, it is required to conduct a foresight analysis every two years, aligning it with technology and regulatory trends to ensure long-term adaptability within the company.

This framework provides a dynamic direction for companies to enhance their energy efficiency practices and align with both current and future regulations. By cycling through these phases, organisations can comply to regulations and improve continuously their energy efficiency in a structured manner. Providing guidelines and directions for improving energy efficiency in both a financial, organisational and environmentally sustainable manner.

5 Conclusion

This chapter starts with answering the research questions, leading to an integrated response to the main research question. It then highlights the scientific and societal relevance of the findings, followed by recommendations for future research to further explore and address the complexities of corporate energy efficiency in the Dutch business sector.

6.1 Answering the research questions

This section systematically addresses the three research sub questions and concludes by answering the main research question. The findings presented offer a structured view of how Dutch companies adapt to and implement energy efficiency policies within their office building operations.

6.1.1 Answering sub questions

Q1: *What are the differences in climate policies and regulations applicable to companies in the Dutch business sector, and how do these regulations impact different types of office buildings?*

The Dutch business sector faces multiple climate regulations focussed on energy efficiency and sustainability within offices. These vary depending on company characteristics such as size, sector, and the physical attributes of their office buildings. The three regulations of the primary focus in this research consists of: the minimum energy label C requirement, the energy savings obligation, and the energy efficiency directive (EED) audit obligation. These regulations present distinct compliance requirements and create different operational impacts across building types, operations and across the different companies.

For instance, the energy label C requirement primarily affects older, larger office spaces, necessitating significant energy upgrades. While newer buildings often already comply to this requirement. The energy savings obligation targets all companies of a certain size. Focusing on cost-effective measures with short payback periods. Meanwhile, the EED audit obligation mandates regular energy audits for large corporations, fostering a systematic approach to energy efficiency. Together, these regulations impose differing compliance burdens based on organisational size, energy usage, and building characteristics. Smaller companies face fewer regulatory demands than larger firms, due to exclusion grounds.

Q2: *What measures have companies in the business sector implemented to improve the sustainability of their office buildings in compliance with the 2023 climate policies?*

Companies in the Dutch business sector are implementing a range of measures to enhance the energy efficiency of their office buildings, as revealed through the interviews presented in Chapter 4. These measures are closely tied to compliance with the 2023 regulations consisting of energy label C, the energy savings obligation, and the EED audit obligation. Common actions include upgrading lighting systems to LEDs, improving insulation, and implementing smart controls for HVAC systems to reduce energy consumption. Multiple companies reported focusing on energy label C compliance, which mandates energy efficiency improvements for office spaces larger than one hundred squared meters. These measures, particularly lighting upgrades and insulation improvements were widely adopted due to their cost-effectiveness and alignment with regulatory requirements. The recognised measures list is often considered as unclear and broad by companies involved in the analysis.

Larger companies often go beyond basic compliance by integrating these measures into broader sustainability strategies. In addition to meeting regulatory requirements, they invest in advanced solutions such as installing solar panels and deploying energy management systems (EMS) to proactively monitor and optimize energy use. These efforts also align with the energy savings obligation, as they often target measures with quick payback periods that reduces operational costs.

Conversely, smaller companies focus on meeting the minimum standards set by regulations, particularly energy label C, due to financial and resource constraints. Measures like LED lighting and basic insulation upgrades were common among smaller and medium sized companies, because they offer immediate energy savings with low upfront costs. While these actions fulfil regulatory obligations, they are often limited to short-term compliance rather than forming part of a broader sustainability strategy. This distinction reflects the varying capacities of companies to navigate and integrate regulatory requirements into their operations.

Q3: *What challenges do companies face in implementing energy efficiency measures, and how are they overcoming these obstacles?*

Dutch companies encounter a range of challenges in implementing energy efficiency measures, with financial constraints emerging as a major obstacle, particularly for small and medium sized companies. The costs associated with substantial energy upgrades, such as installing renewable energy sources or performing extensive insulation work, are often prohibitive for smaller firms. To alleviate this burden, some companies take advantage of government subsidies, tax incentives, and low-interest loans, though accessibility and sufficiency of these funds vary.

Another significant challenge is the split-incentive dilemma, which affects tenant companies. In cases where tenants bear energy costs but lack control over structural improvements, landlords may have little incentive to invest in energy efficiency upgrades. Some tenant companies are addressing this issue through green lease agreements, which clarify shared responsibilities and foster collaboration on energy-related projects. Additionally, limited in-house expertise in energy management poses a barrier for many companies, particularly those without dedicated sustainability roles. In response, companies are increasingly engaging external consultants and participating in capacity-building programs to enhance their internal capabilities and to ensure that they commit to audit obligations with the help of these external organisations. These solutions reflect both structural and strategic adaptations to regulatory and financial challenges, underscoring the need for policy adjustments to support diverse organisational needs.

6.1.2 Answering the main research question

How are Dutch companies in the business sector incorporating Dutch climate policy related to energy efficiency into their office building operations?

Dutch companies incorporate energy efficiency policies in diverse ways, influenced by organisational structure, size, sector, and (financial) resource availability. Larger firms align energy efficiency measures with strategic sustainability objectives, leveraging advanced technologies and robust organisational frameworks. This integration positions them to exceed compliance requirements, viewing energy efficiency as both a regulatory obligation and a competitive advantage. Taking places as innovative sustainable frontrunners, due to a form of responsibility and a message to send to other companies and customers.

In contrast, smaller companies, constrained by financial and organisational limitations, approach energy efficiency more as a regulatory obligation than as a strategic opportunity. These firms typically engage in essential compliance activities, such as LED lighting upgrades and basic insulation improvements, which fulfil regulatory requirements without incurring significant expenses. Limited resources and expertise mean that energy efficiency remains a compliance-driven activity rather than a proactive sustainability initiative.

The findings further indicate that Dutch climate policies provide a foundation for energy management but fall short of encouraging companies to adopt comprehensive, voluntary energy strategies. While larger companies have the capacity to align energy efficiency with long-term objectives, smaller companies focus primarily on meeting baseline requirements due to cost and operational constraints. This dynamic suggests that additional support mechanisms, such as customised incentives, collaborative policy frameworks, and tailored compliance pathways, are needed to bridge the gap between compliance and voluntary energy management, especially for small and medium sized companies and tenant companies facing split-incentive challenges.

6.2 Scientific and societal relevance

6.2.1 Scientific relevance

This research addresses a knowledge gap in understanding how non-industrial and office-based companies adapt to energy efficiency regulations in the Netherlands. Existing literature focuses on energy-intensive sectors or large-scale industries, because of the significant energy usage and the brief time since energy efficiency regulations have been implemented for office-based companies. Office-based companies have been overlooked, despite their contribution to urban energy consumption and emissions. This study brings attention to this business sector, offering insights into how these companies interact with the implemented regulations of 2023. Investigating organisational challenges, external dependencies and measures that are considered effective since the implementation of the regulations.

By focusing on service-oriented industries, this research expands theoretical frameworks in corporate sustainability and energy efficiency within offices. It integrates organisational behaviour, regulatory compliance, and external factors such as tenant-landlord dynamics in the study. This contributes to a more comprehensive understanding of how the latest regulations impact companies and how these adapt on dynamics in the sustainable regulatory landscape. This aligns with and extends theories discussed in previous research by Jaffe and Stavins (1994), which explore the interplay between regulations and organisational adaptation.

A contribution of importance is the insight of the split-incentive dilemma. This occurs when tenants face operational costs for energy inefficiency but lack control over structural upgrades. Due to the fact that landlords, who hold this control, often lack incentives for investments. This insight challenges assumptions about the independence of businesses in addressing energy efficiency, highlighting the importance of external dependencies in shaping new regulations or policies in this field. By addressing this dilemma, the research expands the academic discussion on how external factors influence corporate adaptation on energy efficiency in their offices and sustainability.

Additionally, this study reveals sectoral differences in corporate responses. For example, companies with partially energy-intensive facilities often treat energy efficiency as a cost-saving strategy. In contrast service-oriented companies aim often for compliance, given lower

operational energy demands. Sometimes these companies go beyond compliance, not for cost-savings but as a part of the long-term strategy of the company. These findings advocate for the design of adaptive, sector-specific policies that reflect organisational diversity. This contributes to academic discussions on ensuring compliance and innovation through tailored regulations, as posited by Porter and van der Linde (1995).

This research extends the academic discussion on SME regulation by integrating the theoretical perspectives of Fairman and Yapp (2005) and Gunningham (2009). It highlights the structural and resource-based challenges SMEs face in implementing energy efficiency measures. For example, navigating the split-incentive dilemma in tenant-landlord relationships, but also limited financial resources. By proposing targeted interventions, this study not only validates existing theories but also provides practical pathways for enhancing future SME participation in the energy transition.

These findings underscore the practical application of Ayres and Braithwaite's (1992) enforcement pyramid. In specific, the requirement of integrating incentives for SMEs to bridge compliance gaps. Furthermore, they extend Black and Baldwin's framework (2010) by highlighting how tenant-landlord dynamics reshape regulatory adaptability, requiring stakeholder-specific approaches. In further research, these frameworks could be tested more explicitly to test the effectiveness of these approaches.

The methodological approach of combining qualitative interviews with thematic analysis provides a replicable model for future research into underrepresented sectors. By focusing on office-based companies, this research introduces a template for examining regulatory impacts in service-oriented companies or industries.

Through these contributions, the research enhances understanding of how regulatory frameworks can be refined to foster more inclusive and effective energy management strategies across diverse sectors, addressing both academic and practical gaps in the field.

6.2.2 Societal relevance

This study emphasises the role of office-based companies in achieving Dutch climate goals. By highlighting the financial, organisational, and regulatory factors influencing energy efficiency, it offers actionable pathways for policymakers and businesses to drive urban energy transitions effectively. The framework structured could be used for designing strategies to make compliance to future regulations feasible.

The practical recommendations in this thesis, such as green lease agreements and financial incentives tailored to sectoral needs, are designed to prevent or overcome barriers derived from the analysis in this research. These measures have the potential to unlock collaborative opportunities between landlords and tenants and address financial constraints. To ensure that all stakeholders contribute meaningfully to the energy transition. Furthermore, integrating sustainability into corporate culture is framed not as a compliance burden but as a strategic opportunity to enhance resilience and meet societal expectations for responsibility of companies increasing their sustainability and energy efficiency. Also creating a culture of awareness of sustainability could prevent protest from employees when measures are applied.

By emphasising systemic solutions, addressing split incentives and fostering voluntary sustainability practices for example, this research advocates for a shift where companies view energy efficiency as both an operational necessity and a societal responsibility. In doing so, it

bridges the gap between policy design and real-world application. Aiming for a low-carbon future that benefits both businesses and communities.

6.3 Recommendations and directions for future research

While this thesis provides significant insights, the complexity of regulatory compliance and energy efficiency requires ongoing investigation. Future research should build on these findings to address unresolved questions and expand the scope of analysis.

6.3.1 Recommendations for specific subjects in further research

This thesis highlights critical aspects of how Dutch office-based companies navigate energy efficiency regulations, but further research is needed to deepen and broaden these insights. Future studies should explore whether short-term compliance measures evolve into long-term sustainability strategies. Longitudinal research would provide valuable insights into how organisations adapt as policies and technologies advance.

Financial barriers, especially for small and medium sized companies, remain a significant obstacle. Quantifying the costs and benefits of measures like LED retrofitting or HVAC upgrades could justify investments by demonstrating long-term savings. These analyses would support policymakers in tailoring financial incentives (Eichholtz et al., 2023). Delving deeper in this aspect could result in more specific insights and detailed recommendations.

The landlord-tenant split-incentive dilemma requires targeted investigation. Research on collaborative frameworks like green leases could identify successful models where both parties share the benefits of energy efficiency improvements. Moreover, cross-national comparisons within the EU could reveal whether the challenges identified in this study are unique to the Netherlands or prevalent elsewhere. Examining regulatory approaches in countries like Germany and France could uncover best practices to enhance EU-wide energy efficiency policies. Above that, the role of emerging technologies, such as AI-driven analytics and smart meters, deserves further exploration. These innovations have the potential to reduce compliance costs and improve energy management. Understanding their impact could offer scalable solutions for corporate energy strategies (Baublys et al., 2015).

By addressing these areas, future research can provide actionable insights for policymakers and companies, driving progress in the energy transition and fostering sustainable corporate practices.

6.3.2 Methodological suggestions for further research

To enhance future research on energy efficiency in corporate office buildings, addressing the methodological limitations discussed in chapter 5 is essential. While this research provided valuable qualitative insights into regulatory compliance and organisational responses, incorporating mixed-methods approaches could improve robustness. Combining qualitative interviews with quantitative data, such as surveys or statistical analyses, would enable a more comprehensive understanding. Surveys could quantify the prevalence of challenges like the split-incentive dilemma across a broader sample, while statistical analyses might uncover correlations between organisational characteristics and compliance strategies. This integration would provide a richer and more generalisable perspective.

Expanding the scope of research beyond office-based sectors and the Netherlands offers another important avenue. Industries such as manufacturing or logistics may share common challenges

with office-based companies or face unique obstacles. Similarly, examining energy efficiency practices in countries with similar regulatory frameworks, like Germany or France, could identify whether the dynamics observed here are context-specific or universal. Comparative research across nations could uncover best practices and inform policymakers on designing adaptable regulatory frameworks.

Improving sample size and diversity is another key priority for future research. Including companies of varying sizes, sectors, and geographical locations would assess whether the findings from this study are broadly applicable. A larger and more diverse sample would provide richer data and a deeper understanding of the factors influencing energy efficiency practices, increasing the relevance of results across different organisational contexts.

Adopting longitudinal designs is also critical for capturing how companies evolve their energy efficiency strategies over time. Observing companies over multiple years would help track shifts from basic compliance to integrated, long-term sustainability practices. Such studies could highlight whether and how regulatory compliance drives strategic organisational change, offering deeper insights into the trajectory of corporate adaptation and innovation.

By addressing these methodological considerations, future research can build on this study's foundational insights. Mixed methods, expanded scope, and longitudinal approaches would yield a nuanced understanding of how organisations navigate regulatory compliance, financial constraints, and sustainability goals. These improvements could inform academic discourse, policy development, and corporate practice, contributing to the urgent goal of advancing a low-carbon, resilient economy.

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Appendix A: communication

A1. Email Nederlands

Onderwerp: Verzoek om medewerking aan interview voor Master Thesis over duurzaamheidsregelgeving

Geachte (naam ontvanger),

Mijn naam is Tjalling Pennink en ik ben een Masterstudent Complex Systems Engineering and Management aan de Technische Universiteit Delft, waar ik momenteel werk aan mijn afstudeeronderzoek over de impact van recente duurzaamheidsregelgeving op bedrijven, met een focus op het minimum energielabel C voor kantoren, de energiebesparingsplicht en de EED audit plicht.

Ik ben erg geïnteresseerd in het perspectief van bedrijven op deze regelgeving en hoe zij zich voorbereiden op en al bijdragen aan deze veranderingen. Daarom zou ik graag de mogelijkheid willen hebben om een interview af te nemen met uw bedrijf om inzicht te krijgen in uw ervaringen, uitdagingen en anticipatie op deze duurzaamheidsinitiatieven.

Het interview zal 30-45 minuten duren en kan worden gehouden op een moment dat het u het beste uitkomt online worden afgenomen, maar ook in een fysiek gesprek. Alle informatie die tijdens het interview wordt verstrekt, zal strikt vertrouwelijk worden behandeld en zal uitsluitend worden gebruikt voor academische doeleinden. Uw persoonlijke of bedrijfsnaam zal niet worden gebruikt of genoemd worden in de eindversie van het onderzoek en is daardoor dus geheel anoniem.

Uw deelname aan dit onderzoek zou van onschatbare waarde zijn en zou bijdragen aan een beter begrip van de implementatie en effecten van deze regelgeving in de praktijk.
Indien u geïnteresseerd bent in het bijdragen aan mijn onderzoek door middel van een interview, hoor ik dat graag. Mocht u nog vragen hebben of meer informatie nodig hebben over mijn onderzoek, dan ben ik uiteraard bereid om deze te beantwoorden.

Met vriendelijke groet,
Tjalling Pennink
Masterstudent
Technische Universiteit Delft

A2. Email in English

Request for Participation in Interview for Master's Thesis
Dear (name of receiver),

My name is Tjalling Pennink, and I am a Master's student in Complex Systems Engineering and Management at Delft University of Technology, currently working on my thesis about the impact of recent sustainability regulations on businesses, focusing on the minimum energy label C requirement for office buildings, the energy-saving obligation, and the EED audit requirement.

I am highly interested in the perspective of companies regarding these regulations and how they are preparing for and already contributing to these changes. Therefore, I would greatly appreciate the opportunity to conduct an interview with your company to gain insights into your experiences, challenges, and anticipation of these sustainability initiatives.

The interview will take 30-45 minutes and can be scheduled at a time that suits you best. It can be conducted online or in person. All information provided during the interview will be treated strictly confidentially and used solely for academic purposes. Your personal or company name will not be mentioned or disclosed in the final version of the research, ensuring complete anonymity.

Your participation in this study would be invaluable and would contribute to a better understanding of the practical implementation and effects of these regulations.

If you are interested in contributing to my research through an interview, I would be delighted to hear from you. Should you have any questions or require more information about my study, I am happy to provide further details.
Thank you for your time reading and considering this email. Have a nice day!

Best regards,

Tjalling Pennink
Master's Student
Delft University of Technology
t.w.pennink@tudelft.nl

A3. Extra interview questions

Spare Questions:

1. How is the impact of your company/institution on the climate defined?
2. When did your company start with taking sustainability measures? How was this decided/ what was the motivation?
3. How does your company evaluate the effectiveness of the taken measures and changes in policy?
4. How does your company experience the enforcement of the regulations?
5. Does your company know the possible consequences for not committing to the sustainability obligations?
6. Do you know that according to this policy the location has to shut down?
7. What are the key aspects of the new climate legislation that affect your company?
8. What steps are have been taken to ensure that the employees are informed about and engaged in sustainability efforts within the company?
9. How do you measure the progress and effectiveness of your companies' efforts to anticipate the new climate legislation and achieve sustainability objectives?
10. What challenges occurred during cooperating with the owner of the office building and deciding for sustainability measures and allocating them?
11. What trade-offs have been made while aiming for more sustainability? How does your company contribute to sustainability?
12. Are there partnerships or collaborations that you are entering into for helping achieve your sustainability and climate goals?

These questions were removed from the initial interview structure. However, during conversations the subject could lead to information whereas these questions could be of relevance. Therefore, these questions have been kept in mind during the interviews for options to ask deeper into a particular subject.

Appendix B: Coding analysis

B1. Quantitative summary

This appendix presents a comprehensive quantitative summary of the coding analysis conducted on the interview transcripts and documents. The analysis identifies key themes, sub-themes, and specific codes, providing a detailed view of the patterns observed in the data.

Table 12: Quantitative summary

Theme	Code Level 1	Code Level 2	Code Level 3	Definition	Description	Coded Text Example	Number of Quotations
Sustainability Strategy	Sustainability Approach	Policy Integration	Top-Down Strategies	Strategies and approaches taken by companies to integrate sustainability into their operations.	Applicable when discussing the overall approach or policy related to sustainability within an organisation.	"We aim to be CO_2 neutral by 2030 and integrate sustainability into all levels of decision-making." (Transcript A)	45
Employee Engagement	Employee Initiatives	Internal Campaigns	Awareness Programs	Efforts made to engage employees in sustainability practices within the company.	Relevant when the interviewee discusses initiatives to increase employee participation in sustainability practices.	"We run workshops and awareness campaigns to engage employees in our sustainability goals." (Transcript C)	32
Regulatory Compliance	Compliance Actions	Legal Requirements	Energy Label Compliance	Actions taken by companies to comply with local and national regulations related to energy efficiency.	Used when interviewees mention compliance with specific regulations or standards (e.g., Energy Label C).	"Achieving Energy Label C was crucial for us, so we implemented various upgrades." (Transcript D)	50
Energy Efficiency Measures	Efficiency Techniques	Technical Upgrades	LED Installation	Technical measures and methods applied to enhance energy efficiency in office buildings.	Applied when specific technical methods or technologies are mentioned as part of energy efficiency initiatives.	"We replaced traditional lighting systems with LED to meet efficiency targets." (Transcript G)	38
Challenges with Landlords	Landlord Cooperation	Negotiation Tactics	Lease Agreements	Challenges and strategies for working with landlords to implement sustainability measures.	Used when discussing the interactions and challenges faced with landlords in implementing	"Negotiations with landlords are ongoing; they must agree before we can make any changes." (Transcript E)	28

					sustainability measures.		

B2. Overview of total codes identified

The analysis identified a total of 278 distinct codes, organised into a structured framework to capture the complexity of the insights gathered:
Level 1 Themes: 5 major themes representing the overarching categories.
Level 2 Sub-Themes: 21 sub-themes that provide a more detailed perspective on each theme.
Level 3 Specific Codes: 62 specific codes that delve into practices and challenges within each sub-theme.

Table 13: Comprehensive coding overview

Themes	Code Level 1	Code Level 2	Code Level 3	Definition of the Code	Description on When the Code is Applicable	Coded Text Example (Company)	Number of Quotations
Regulatory Compliance	Legal Requirements	Energy Label C Compliance	Landlord Negotiations	The process companies follow to meet mandatory energy label regulations, specifically involving third-party property owners.	When companies that rent office spaces negotiate with landlords to implement necessary upgrades to meet energy standards.	"We rent the property, so we are largely dependent on what owners do." (Interview A)	15
			Retrofit Solutions	Measures taken to upgrade existing building elements to meet Energy Label C, such as insulation and heating systems.	When companies implement retrofitting measures like updating insulation, windows, or heating systems to achieve compliance.	"We upgraded all our office windows to triple glazing to enhance energy efficiency." (Interview F)	13
			Tenant-Landlord Collaboration	Coordination between tenants and landlords to agree on energy efficiency improvements.	When companies engage in ongoing communication and planning with landlords to ensure compliance and implementation of energy-saving measures.	"We always try to make our voices clear...but we are really dependent on the landlords." (Interview D)	9
	Audit Obligation Compliance	Reporting and Documentation	Data Management Practices	Systems companies implement to track, manage, and report energy data as required by regulations.	When firms establish data management systems to ensure accurate and compliant reporting of energy usage data.	"We've set up an automated system to gather and process energy data for our EED reports." (Interview C)	11
			External Consultant Engagement	Hiring third-party experts to help manage and complete audit requirements.	When companies outsource audit-related tasks to ensure compliance with	"The research was done by our installer, not an internal branch." (Interview E)	8

					EED regulations efficiently.		
	Compliance Monitoring	Continuous Improvement Audits	Efficiency Improvement Tracking	Monitoring the progress of efficiency measures post-implementation to ensure continuous compliance and improvement.	When companies perform regular checks to assess the effectiveness of energy-saving measures and implement adjustments.	"We conduct audits every two years to reassess and improve our energy use efficiency." (Interview H)	10
			Internal Compliance Teams	Teams within companies dedicated to ensuring ongoing compliance and implementing recommended energy-saving practices.	When companies form internal teams tasked with monitoring and ensuring adherence to regulatory energy standards.	"Our compliance team manages energy use and audits, ensuring all offices meet or exceed requirements." (Interview J)	12
Sustainability Measures	Building Efficiency	Retrofitting and Insulation	High-Performance Materials	Use of advanced materials like thermal insulation and eco-friendly building components to reduce energy use.	When companies employ cutting-edge materials for retrofitting and enhancing the energy performance of buildings.	"Installing HR++ glass was a key measure." (Interview F)	14
			Green Roofs and Facades	Implementing eco-friendly building upgrades like green roofs and facades to improve energy efficiency and biodiversity.	When companies use green architecture elements as part of their building efficiency improvements.	"Green roofs have helped reduce heat absorption." (Interview C)	7
	Renewable Energy Integration	Solar and Wind Technology	Rooftop Solar Installations	Installation of photovoltaic systems on building rooftops to generate renewable energy on-site.	When companies install rooftop solar panels to generate electricity as part of their energy strategy.	"We have solar panels on our rooftops generating electricity." (Interview F)	18
			Battery Storage Systems	Using energy storage solutions like batteries to store excess solar or wind energy for later use.	When companies integrate energy storage solutions to optimize the use of generated renewable energy.	"We use batteries for energy storage during peak hours." (Interview C)	6
	HVAC System Upgrades	Smart Controls and Efficiency	HVAC System Overhaul	Full upgrades of HVAC systems including the replacement of outdated units with high-efficiency models and automation.	When companies undergo significant upgrades to HVAC systems to improve energy use and environmental comfort.	"Replacing HVAC units with automated systems cut energy use by 30%." (Interview A)	14
	Lighting Upgrades	LED and Sensor Installation	Daylight Harvesting Systems	Systems that adjust lighting levels based on the amount of natural light available, reducing energy consumption.	When companies implement lighting systems that automatically adjust based on daylight to save energy.	"Daylight sensors automatically dim the lights when there's sunlight." (Interview J)	9
	Water Conservation	Low-Flow Fixtures and Recycling	Rainwater Harvesting Systems	Collecting and reusing rainwater for non-potable applications like irrigation and toilet flushing.	When companies install rainwater harvesting systems as part of their water conservation strategy.	"Rainwater is harvested for all non-drinking purposes." (Interview G)	5
Corporate Culture	Motivation for Sustainability	Internal vs. External Drivers	Compliance vs. Voluntary Measures	Differentiating between sustainability initiatives driven by regulatory	When companies explain the motivations behind their	"Our initiatives go beyond compliance; they're part of our core CSR strategy." (Interview B)	12

				requirements versus voluntary interview initiatives.	sustainability policies, whether due to regulations or voluntary corporate responsibility.		
			Employee-Led Green Initiatives	Grassroots sustainability efforts led by employees, such as forming green teams or suggesting eco-friendly policies.	When employees take the initiative to drive sustainability efforts beyond top-down management policies.	"Our green team drives recycling initiatives." (Interview E)	10
	Employee Engagement	Training and Awareness Programs	Gamification of Green Practices	Using gamification techniques, such as reward systems or competitions, to encourage employees to engage in sustainability practices.	When companies introduce fun or competitive elements to promote employee participation in sustainability.	"We launched a green challenge, rewarding teams for reducing their paper use." (Interview M)	6
Energy Usage Management	Operational Changes	Smart Metering	Automated Energy Alerts	Systems that provide real-time notifications to building managers when energy use exceeds predefined thresholds.	When companies set up alert systems for better management and response to energy consumption anomalies.	"Our alert system flags high consumption periods." (Interview L)	8
			Centralised Energy Monitoring	Using centralised systems that track energy usage across multiple locations in real-time for better management.	When companies use advanced software platforms to manage and optimize energy use across all offices and facilities.	"We monitor all office buildings through a single platform." (Interview D)	12
Technology Integration	Smart Building Solutions	IoT Integration	Predictive Maintenance Systems	IoT systems that predict when equipment will need maintenance based on usage patterns and performance data.	When companies implement predictive technology to maintain systems proactively and avoid inefficiencies.	"Our predictive maintenance platform alerts us before failures." (Interview K)	10
			Adaptive Lighting Systems	Systems that automatically adjust lighting based on real-time occupancy and activity levels.	When companies employ smart systems to adjust lighting and reduce energy waste depending on office usage.	"Our adaptive lighting system dims when no movement is detected." (Interview A)	13
Challenges in Implementation	Financial Constraints	Upfront Investment Costs	Access to Green Financing	Exploring options like green loans or subsidies to offset the initial costs of sustainability measures.	When companies seek financial support to overcome cost barriers associated with energy-efficient upgrades.	"We applied for a green loan to fund our solar panel installations." (Interview F)	8
			Long-Term Financial Planning	Developing long-term strategies to ensure sustainable investments yield acceptable returns within interview financial models.	When companies create detailed plans to manage the payback period and ROI of sustainability projects.	"We've set up a 10-year plan to ensure that all our investments in energy efficiency are financially viable." (Interview B)	9

B3. Themes

Regulatory Compliance

Total Quotations: 45

Energy label C compliance: 17 quotations detail the challenges companies face in negotiating with landlords and implementing necessary measures to meet energy standards.

Audit obligation compliance: 11 quotations describe the complexities of compiling accurate energy consumption data for compliance reporting.

Compliance monitoring: 17 quotations highlight continuous improvement audits and monitoring efforts to maintain compliance.

Sustainability measures

Total quotations: 88

Building efficiency (Retrofitting and insulation): 24 quotations describe efforts to improve insulation and building efficiency using advanced materials.

Renewable energy integration (Solar and wind technology): 20 quotations discuss the adoption of solar panels and other renewable technologies.

HVAC system upgrades (Smart controls and efficiency): 16 quotations focus on the integration of smart controls and HVAC updates to boost efficiency.

Lighting upgrades (LED and sensor installation): 21 quotations reference the transition to LED lighting and the use of motion sensors to reduce energy use.

Water conservation (Low-Flow fixtures and recycling): 7 quotations cover the implementation of water-saving measures like low-flow fixtures and water recycling.

Corporate culture

Total quotations: 42

Motivation for sustainability (CSR vs. Regulatory): 13 quotations explore whether sustainability initiatives are driven by corporate social responsibility (CSR) goals or regulatory demands.

Employee engagement (Training and awareness programs): 12 quotations illustrate training programs and awareness campaigns to encourage energy-saving behaviours.

Organisational structure (Sustainability teams): 17 quotations emphasise the role and responsibilities of internal teams dedicated to sustainability management.

Energy usage management

Total quotations: 26

Operational changes (Smart metering): 16 quotations discuss the use of smart meters for real-time monitoring and management of energy use.

Building occupancy management (Space utilisation optimisation): 10 quotations describe strategies like adjusting heating schedules based on building occupancy patterns.

Technology integration

Total quotations: 34

Smart building solutions (internet of things (IoT) integration): 18 quotations detail the integration of IoT devices and automated systems for efficient energy management.

Digital energy platforms (Building management systems - BMS): 16 quotations explain the use of centralised platforms to manage and optimize building systems.

Challenges in implementation

Total quotations: 65

Financial constraints (Upfront investment costs): 19 quotations highlight financial barriers like high initial costs and long payback periods for energy-efficient upgrades.

Technological limitations (Compatibility and integration): 15 quotations discuss difficulties in integrating new technologies, especially in older buildings.

Dependence on stakeholders (Landlord and stakeholder involvement): 21 quotations outline the challenges of working with landlords or co-occupants to implement sustainability measures.

Interview practices and common measures

Heat pump implementation: 9 out of 13 companies reported considering implementing heat pumps as part of their energy-saving measures. However, most of them did not come to an agreement with the building owner or it was not possible due to the size of the building.

LED lighting: 8 companies indicated the installation of LED lighting systems as a standard approach to reduce energy consumption.

Solar panel adoption: 7 companies have either installed or plan to install solar panels to integrate renewable energy.

Smart HVAC Systems: 6 companies discussed integrating smart HVAC technologies to optimise energy management and efficiency.

Additional observations

Financial challenges: A significant number of quotations (19) point to financial constraints, such as high upfront costs and long payback periods, as major considerations when planning energy efficiency upgrades.

Stakeholder collaboration: Many quotations (21) underscore the challenges of implementing sustainability measures in rented or shared office spaces, emphasizing the need for effective communication and collaboration with landlords and other stakeholders.