



TOWARDS GREENER PASTURES

MANAGEMENT OF CORPORATE SUSTAINABILITY TENSIONS IN INTERNAL INVESTMENT DECISION-MAKING PROCESSES

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Abstract

This qualitative study investigates the integration of corporate sustainability in the internal investment decision-making process and how potential corporate sustainability tensions are managed through the process. The two investment processes for capital investments and product developments were analyzed as the processes consider different Scope emissions and are both essential in organizations' endeavors towards a greener future. A single case study was conducted where 30 organizational members at different divisions and hierarchical levels were interviewed. The findings show that for capital investments, sustainability tensions are managed through spatial and temporal separation strategies, consequently splitting the two poles of the tension to accommodate them both. For product developments, the process manages the tensions by introducing a new element that has the potential to accommodate both poles of the tension. The diverging tension management strategies were a result of different strategic and structural contexts. The thesis thereby contributes to the literature on internal investment decision-making, corporate sustainability tension management and integration of corporate sustainability into organizational processes.

Keywords:

Internal Investment Decision-Making, Corporate Sustainability Tensions, Resource Allocation Process, Capital Budgeting Process, Paradox Theory

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1. Introduction

“How resources are actually allocated and used determines strategic outcomes - not the words on paper or policies.” (Bower & Gilbert, 2005).

A decision on where to allocate resources is not solely influenced by mere financial calculations, rather, internal investment decision-making processes (hereafter IIDM) entail intuitive judgment (Grant & Nilsson, 2020), psychological biases (Harris, 1999; Haka, 2007), organizational settings (Bardolet et al., 2010) as well as proactive responsibility taking (Bower & Gilbert, 2005). In the words of Bower & Gilbert (2005), the resource allocation process (hereafter RAP), as a part of the IIDM process, is the determining factor of strategic outcome, not policies or internal process documents.

The IIDM process, consisting of capital budgeting instruments such as the net present value method (NPV) or the payback period calculation, facilitates the evaluation and decision-making for investment opportunities (Sureka et al. 2022). The basis for the IIDM process is formed by the applied accounting, which can be considered a performable space that facilitates change (Mouritsen & Hald, 2018). Although NPV calculations and accounting remain at the heart of the IIDM, Miller & O’Leary (2007) stress that researchers and practitioners need to explore the realm beyond valuation techniques and acknowledge the managerial complexity, institutional character, and overall influences.

The 2015 Paris agreement marks a significant milestone in the development of corporate sustainability, uniting governments from around the world in committing to limiting the rise in global temperature to below 1.5°C (SBTi, 2023). The Science-Based Targets initiative (SBTi) provides a pathway for the private sector to address global warming and to contribute to the overarching goal. In the measurement and reporting of carbon emissions, SBTi (2023) refers to different Scope emissions. These include Scope 1 (direct GHG emissions), Scope 2 (indirect GHG emissions through electricity, heating, cooling, or steam) and Scope 3 (indirect GHG emissions from downstream and upstream value chain activities, other than those covered in Scope 2). Since the signing of the Paris agreement, stakeholders have increased their pressure on companies to commit to sustainability targets and reduce carbon emissions (Mikes & Metzner, 2023).

Sustainability itself consists of three dimensions, namely economic, environmental, and social, which are all vital for organizations to strive (Hyršlová et al., 2015). Excelling sustainably requires companies to relinquish the dominating business case perspective (Hahn et al., 2018) and pursue conflicting targets, although they might bear the potential of stressing corporate tensions (Lüscher & Lewis 2008; Hahn et al., 2015). When strategy and contexts change, as with an increased sustainability focus, processes such as the RAP must adapt as well to ensure alignment (Bower & Gilbert, 2005). Historically, corporate sustainability has not been a part of the capital budgeting process (Hayat & Orsagh, 2015),

however the recent developments and increased pressure on companies to reduce carbon emissions has led to the deployment of internal carbon price calculations and similar carbon accounting practices to influence decision-making (He et al., 2020; Mikes & Metzner, 2023). Kimbro (2013) stresses that regardless of a firm's commitment to sustainability, managers can benefit from integrating sustainability into the IIDM in order to both maximize shareholders' and stakeholders' value, while respecting the environment. As such, it is imperative to understand the integration of corporate sustainability in IIDM and how the process is affected.

In their analysis of the incorporation of corporate sustainability considerations in capital budgeting processes, Frost & Rooney (2021) highlight the importance of incorporating non-financial knowledge to not diminish certain aspects of sustainability. Previous research has shown that sustainability can have a direct or indirect impact on investment decisions (Vesty & Oliver, 2014) and that incremental changes to management control systems (MCS) have the potential of facilitating sustainability management (Gond et al., 2012; Arjaliès & Mundy, 2013; Beusch et al., 2022; Mikes & Metzner, 2023). Scholars illustrate how the paradoxes, challenges and tensions, corporations face in the integration of sustainability potentially lead to the prioritization of the business case over sustainability performance (Hahn & Figge, 2011; Hahn et al., 2015; Hahn et al., 2018). Followingly, it is of utmost importance to understand how corporate sustainability tensions are managed in IIDM and how the process allows companies to address all dimensions of sustainability simultaneously.

Researchers emphasize the need for future studies on resource allocation and strategy (Bower & Gilberts, 2005; Hahn et al., 2018; Sureka et al., 2022), while requesting more evidence on potential integrations of corporate sustainability into organizational processes (Hahn et al., 2015; Hahn et al., 2018; Mikes & Metzner, 2023). Research has yet to explore the integration of corporate sustainability into IIDM, how the integration affects the process, and how potential tensions are managed. As the IIDM shapes the realized strategy, it is important for research and practitioners, to understand the ways corporate sustainability affects the IIDM process and how potential sustainability tensions are managed. The purpose of this thesis is to contribute to the presented research gap and explore the way IIDM manages corporate sustainability tensions. More specifically this thesis will analyze how two distinctly different IIDM processes, capital investment and product development, manage corporate sustainability tensions. The emphasis is set on the two processes, as this enables the comprehension of various responses in diverging settings. The processes differ in their objectives concerning financial targets and their respective focus on Scope emissions, as the capital investment process regards Scope 1 & 2 emissions and product development focuses on Scope 3 emissions. Hence, the research question is formulated as follows:

How is the internal investment decision-making (IIDM) process affected by the integration of corporate sustainability and how are possible tensions managed?

The results of the single case study indicate that the IIDM process for capital investments manages corporate sustainability tensions through spatially and temporally separating the opposing poles of the tension, in line with previous research on corporate sustainability tensions management (Smith & Lewis, 2011; Hahn et al., 2015). The spatial and temporal separation strategy was facilitated by the stringent process of capital investments combined with CO2 quantification challenges. The IIDM process for product development manages corporate sustainability tensions by either acknowledging a tension and working through it, or by introducing a new element that accommodates both poles of the tension, which researchers refer to as a resolution strategy through synthesis (Hahn et al., 2015). In the empirics this was achieved by utilizing accounting as a performable space (Mouritsen & Hald, 2018) and adapting the accounting through the introduction of a new element; Scope 4. Alternatively, the management of corporate sustainability tensions was achieved by introducing a new element in the form of a new product mix. While the two IIDM processes differ in corporate sustainability tension management, both processes highlight the pivotal role of context in steering the IIDM process. Thus, the results illustrate how practitioners can manage corporate sustainability tensions in the IIDM process for capital investments and product developments.

The thesis will further be structured as follows: Section 2 describes previous literature on IIDM and corporate sustainability, concluding in a theoretical framework utilized for the analysis of the theory and empirical findings. Followingly, section 3 expands on the methodology, where research design, data collection, data analysis and validity are presented. Section 4 will present the empirical findings of the IIDM process in capital investments and product development. These findings will then be discussed in section 5 with the assistance of theory presented in section 2. Lastly, a conclusion, limitations and suggestions for future research will be elaborated upon in section 6.

2. Theory

To investigate the subject matter of the thesis, a comprehensive literature review and a theoretical framework will be elaborated upon. The theory section starts by introducing the domain theory, exploring prior literature on the IIDM process. Building on this basis, the section expands on prior research on corporate sustainability development and challenges, assessing the integration of sustainability into the IIDM process. Subsequently, the method theory utilized as a lens to analyze the domain theory is expanded upon. Finally, the synthesis of the domain and method theory is presented in a theoretical framework.

2.1. Domain Theory

In the literature on Internal Investment Decision-Making (IIDM), three subcategories have been identified that are of relevance for investigating the presented phenomena. Firstly, the resource allocation process, as a formal structured process used by companies to pursue investment decisions. Secondly, the methodology of capital budgeting, laying the foundation for understanding the technicalities of IIDM. Thirdly, factors influencing the IIDM are presented that elaborate on the nuances of the process. Subsequent to the three literature categories of IIDM, corporate sustainability developments and challenges, and the integration of corporate sustainability into the IIDM process will be elaborated upon in order to refine the research domain of the thesis and highlight the identified research gap. Selected previous literature from the different subcategories in the domain theory is presented in Table 1.

Source	Title	Publication	Main findings
<i>Resource Allocation Process</i>			
Bower (1970)	Managing the Resource Allocation Process: A Study of Corporate Planning and Investment	<i>Harvard Business School</i>	The RAP consists of three processes: definition, impetus and structural context. Structural context is the primary force shaping projects and the provision of impetus results in a commitment. Project selection is an integral part of corporate strategy formulations, understanding RAP is essential to understand strategy.
Bower & Gilbert (2005)	From resource allocation to strategy	<i>Oxford University Press</i>	Summarizes 35 years of RAP research since Bower (1970). Highlighting that there are internal and external factors affecting the RAP. Views the RAP as two processes, first the internal and external forces that influence definition and selection. The second process is the RAP itself, which remains multilevel, simultaneous and dynamic.
Strauch et al. (2019)	Process matters – How strategic decision-making process characteristics impact capital allocation efficiency	<i>Long Range Planning</i>	Process formalization and analytical comprehensiveness have a positive influence on the efficiency of allocation decisions. Dynamic environments harm the processes but reward managerial involvement.
<i>Methodology of Capital Budgeting</i>			
Graham & Miller (2001)	The theory and practice of corporate finance: evidence from the field.	<i>Journal of Financial Economics</i>	Payback period remains the most used internal investment calculation technique, followed by NPV and IRR. Large firms tend to use NPV calculations, while smaller firms tend to apply a payback criterion. Meanwhile, large firms use a company-wide discount rate to a larger extent than small firms.
Brounen et al. (2004)	Corporate Finance in Europe: Confronting Theory with Practice	<i>Journal of Financial Management</i>	Valuation techniques such as NPV, IRR and payback period facilitate the evaluation and decision-making of internal investments.
Flyvbjerg et al. (2007)	Underestimating Costs in Public Works Projects: Error or Lie?	<i>Journal of the American Planning Association</i>	Cash flow estimations in internal investments are inherently uncertain and cost estimates are optimistically biased and systematically misleading. Consequently, members should not trust cost estimates and cost-benefit analyses produced by project promoters and their analysts.
Sureka et al. (2022)	Five decades of research on capital budgeting – A systematic review and future research agenda	<i>Research in International Business and Finance</i>	Literature review of five decades of research on capital budgeting. On the basis of the literature review, creates a conceptual framework that shows the antecedents, moderators and outcomes of research on capital budgeting. Grounded on the detailed content analysis, future research directions are proposed to advance this field of research.
<i>Influence Factors on IIDM</i>			
Miller & O'Leary (2007)	Mediating instruments and making markets: Capital budgeting, science and the economy	<i>Accounting, Organizations and Society</i>	The practice of internal investment decision making extends further than valuation techniques. Mediating instruments shape the decision-making. These instruments help to align investments with other firms, leading to the development of future markets.
Mouritsen & Hald (2018)	Intellectual capital and the 'capable firm': Narrating, visualising and numbering for managing knowledge	<i>Accounting, Innovation and Inter-Organisational Relationships</i>	Accounting is a performable space, not a direct representation of reality. As accounting is a performative space, actors need to adapt and extend it to better 'represent' reality. Accounting can thus facilitate change and innovation.
Grant & Nilsson (2020)	Pre-merger acquisition capabilities: A study of two successful serial acquirers	<i>European Management Journal</i>	Internal investment decision making is built on a mixture of financial and strategic rationales. Some strategic rationales are not translated into financial rationales, leading participants to intuition-based decision-making. Consequently, the expertise of the decision-makers is what matters in the IIDM, not the tools at their disposal.
<i>Corporate Sustainability Development and Challenges</i>			
Kimbro (2013)	Integrating Sustainability in Capital Budgeting Decisions	<i>Springer</i>	Two approaches exist to integrate environmental risk into the financial calculations in IIDM. Either a sustainability adjusted risk rate, or quantifying sustainability cost in the NPV. The sustainability adjusted risk rate would be added to the discount rate of the project, subsequently penalizing non-sustainable investment by lowering the NPV.
Hahn et al. (2018)	A Paradox Perspective on Corporate Sustainability: Descriptive, Instrumental, and Normative Aspects	<i>Journal of Business Ethics</i>	Companies must pursue conflicting sustainability targets, even though this can increase their intensity. If corporate sustainability tensions are not managed, the business case perspective will dominate. The paradox perspective allows for an approach that accepts tensions, rather than avoids them. It encourages decision-makers to embrace and manage these tensions within sustainability, empowering them to address multiple environmental and social issues, even when immediate business advantages may not be apparent.
He et al. (2020)	Corporate carbon accounting: a literature review of carbon accounting research from the Kyoto Protocol to the Paris Agreement	<i>Accounting and Finance</i>	Systematic literature review of research on carbon accounting between 2005 and 2018. The literature has developed into four major streams of carbon accounting: carbon disclosure, management, performance and assurance. Furthermore, emphasizing that carbon accounting is emerging as a distinct discipline. Carbon accounting has the potential to facilitate sustainability changes but it must hybridize with other disciplines to find appropriate solutions to the complex challenges within sustainability.
Beusch et al. (2022)	Management control for sustainability: Towards integrated systems	<i>Management Accounting Research</i>	MCSs have the potential to increase the degree of sustainability integration in organizational strategy. Sustainability control systems remain in the periphery, having limited impact on shaping strategy. Through incremental changes in MCS practices, sustainability can become more integrated in strategy. Communication and commitment throughout the value chain prevents diminishing sustainability considerations.
Mikes & Metzner (2023)	Lightening the Carbon Load: Using Management Control Systems to Manage Decarbonization Strategies	<i>Journal of Management Accounting Research</i>	Explores the role of MCSs in managing decarbonization objectives. Since the Paris Agreement stakeholders are increasing the pressure on companies to decarbonize. MCSs and accounting has the potential to facilitate decarbonization, for instance through incorporating carbon price calculations in the IIDM.
<i>Integration of Corporate Sustainability in the IIDM Process</i>			
Vesty & Oliver (2014)	Corporate strategy and accounting for sustainability in investment appraisal	<i>Corporate Ownership & Control</i>	Sustainability can have a direct or indirect impact on capital investment appraisals, where indirect impacts can be intentionally or unintentionally ignored if not prioritized in the accounting model. Either accounting must adapt, or individuals can impose their own judgment criteria on whether to include sustainability into the IIDM.
Frost & Rooney (2021)	Considerations of sustainability in capital budgeting decision-making	<i>Journal of Cleaner Production</i>	Examines the considerations of corporate sustainability in capital budgeting. A successful integration is based on understanding that accounting is flawed. Furthermore, the authors stress the importance of incorporating non-financial knowledge and evaluation criteria to avoid diminishing sustainability.

Table 1. Overview of Selected Previous Literature

2.1.1. Resource Allocation Process

The resource allocation process (RAP) was first discussed by Bower (1970), who argues that the RAP is a complex, multilevel phenomenon, that fundamentally shapes a firm's strategy. To understand how resources are allocated in organizations is not only vital for firms' strategy, but also for researchers to understand how decision-makers can guide organizations to be sustainable and successful (Bower & Gilbert, 2005). Bardolet et al. (2010) highlight that the most important decisions made by managers are where and how to allocate resources among various business opportunities.

Bower & Gilbert (2005) summarize 35 years of research within the RAP and argue that while the RAP model has been revised, it remains relevant and in use to this day. Even though the RAP research has evolved, the process that leads to strategic outcome remains stable despite changing environments (Bower & Gilbert, 2005). Bower & Gilbert (2005) argue that structural and strategic contexts are not the only forces that affect the bottom-up process of resource allocation. In particular, Christensen & Bower (1996) utilized observations of anomalies to identify other sources of external and internal influences and find that the product market context makes the companies invest in short term profits that will be suboptimal over the long term. Moreover, Noda & Bower (1996) describe the impact of the capital market context on the RAP. By comparing two companies, Noda & Bower (1996) illustrate how the capital market context can have a significant impact on the strategy and particularly on development processes. Despite having similar local markets, the two companies introduced different business plans as a consequence of the capital market context.

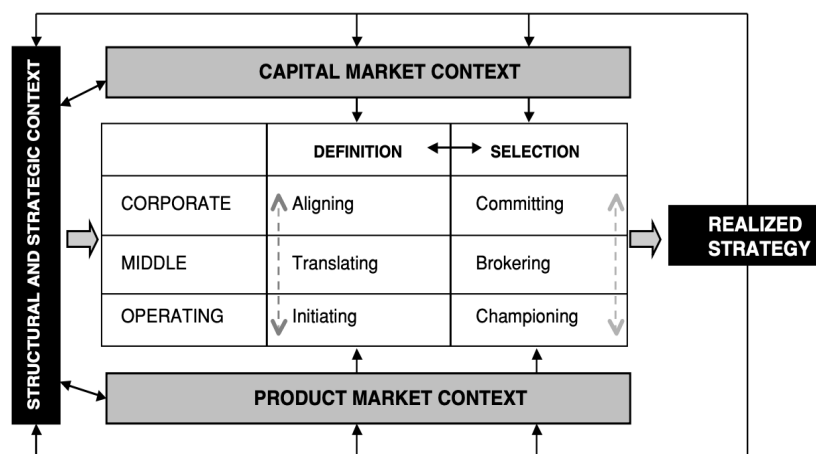


Figure 1. The Revised RAP Model by Bower & Gilbert (2005)

Armed with the subsequent research that identified differing distinct forces that influence the bottom-up processes within RAP, Bower & Gilbert (2005) created a revised RAP model (Figure 1). The model highlights how the bottom-up process of resource allocation forms the realized strategy, emphasizing the value and influence of individuals on the allocation of resources. Nevertheless, it is underlined that the core elements of the RAP,

definition, and selection processes, as presented in the original model by Bower (1970) remain consistent. The revised model highlights the underlying theory of the RAP, namely that the way resources are allocated in an organization determines the realized strategy of the firm (Bower & Gilbert, 2005).

Strauch et al. (2019) argue that a varying resource allocation efficiency is a result of the configuration of the capital allocation decision-making process. Process formalization and analytical comprehensiveness have a positive influence on the efficiency of allocation decisions, while dynamic environments harm the processes and reward managerial involvement (Strauch et al., 2019). Noteworthy discoveries within the RAP research stream include the observation that senior management's most potent impact on internal resource allocations originates from their ability to mold suitable structural and strategic environments (Eisenman & Bower, 2000). Furthermore, it is evident that managerial judgment and the utilization of heuristics, frames of reference, and consensus can exhibit considerable diversity across different organizational contexts, giving rise to psychological biases that exert substantial influence (Harris, 1999; Haka, 2007). The process characteristics of the RAP are generally acknowledged, although no holistic framework has yet to be published (Strauch et al., 2019).

Despite this important role of the RAP in forming strategy (Bower, 1970; Bower & Gilbert, 2005), it has seen little attention in the empirical strategy literature (Miller & O'Leary, 2007; Bardolet et al., 2010). To comprehend the details of the RAP, Miller & O'Leary (2007) emphasize that extending the narrow perspective of valuation techniques and instead view it as a complex managerial and institutional process is necessary.

2.1.2. Methodology of Capital Budgeting

Essential to the IIDM process are the instruments and tools utilized as a foundation to the allocation decisions, such as capital budgeting. Kimbro (2013) describes capital budgeting as the process by which an organization determines which investments are worth pursuing in order to support a firm's operations and organizational goals. Similarly, Sureka et al. (2022) describes capital budgeting as a planning instrument that assists to allocate financial resources among investment projects, with the intention of making the right investment decisions. As such, the capital budgeting process facilitates the measurability, and feasibility analysis of investments, while emphasizing accountability in the process (Sureka et al., 2022). Common capital budgeting techniques utilized are net present value (NPV), payback time and internal rate of return (IRR), of which NPV is considered theoretically superior (Brunzell et al., 2011).

Early studies on capital budgeting found that discounted cash flow models are the least employed and appreciated capital budgeting techniques, whereas the payback period technique is preferred (Miller, 1960; Schall et al., 1978; Pike, 1996). While the payback period technique is still widely used, the 21st century has seen a shift to more sophisticated capital budgeting techniques, such as NPV or IRR calculations (Sureka et

al., 2022). This is also strengthened by Brounen et al. (2004) who highlights in a survey on 313 European firms that the payback period technique is the most popular, followed by NPV and IRR. In an earlier study, Graham & Miller (2001) found in their survey of 392 CFOs in the US, that large firms heavily rely on NPV techniques, while smaller firms tend to use a payback criterion. Furthermore, large firms tend to use a company-wide discount rate rather than a project-specific discount rate (Graham & Miller, 2001). While different valuation techniques are important to make decisions on resource allocation, cash flow estimates are inherently unsure and cost estimates are often optimistically biased and systematically misleading (Flyvbjerg et al., 2007). Consequently, in addition to financial calculations, other inputs are necessary to steer the IIDM process.

2.1.3. Influence Factors on the Internal Investment Decision-Making Process

Sureka et al. (2022) explain that since capital budgeting is a planning decision, there are various factors influencing it. One influence factor is the negative emotional response bias that could lead decision-makers to reject an investment, despite high promised financial returns (Kida et al., 2001). However, Fehrenbacher et al. (2020) show that accountability for the approvers can mitigate the affective reactions, subsequently improving the decision-making process. Other factors influencing decision-making include overconfidence and compensation in firm's investments (Gervais et al., 2011), management forecast quality (Goodman et al., 2014), principal-agent biases (Stein (2003), framed information (Kerler et al., 2012) and cognitive biases for even allocation of resources due to naive diversification and partition dependence (Bardolet et al., 2010).

In a strategic capital budgeting context, Grant & Nilsson (2020) describe that the act of capital budgeting is built on a mixture of strategic and financial rationales. The authors show that while some strategic rationales are translated into financial rationales, some are not, thereby resulting in intuitive judgment decisions (Grant & Nilsson, 2020). As a result, Grant & Nilsson (2020) question the usefulness of tools in capital budgeting, as it's the expertise of the decision-makers to create strategic and financial rationales that is of importance in capital budgeting decision-making, not the tools they utilize.

Miller & O'Leary (2007) aimed to remedy the empirical deficit in studies on RAP since Bower's (1970) findings demonstrate that allocating capital is more than a set of financial valuation techniques. Miller & O'Leary (2007) showcase that mediating instruments are practices that shape the decision-making in the capital budgeting process. These mediating instruments, such as Moore's law and technology roadmaps, provide frameworks that help to align capital budgeting processes with investments done by other companies, which is vital for the development of future markets (Miller & O'Leary, 2007).

At the foundation of the IIDM process is accounting, which is a fluid phenomenon according to Mouritsen et al. (2001), as aspects of a calculation can be given various

weights. Accounting and calculations are no representation of the world, rather a “representation” that engages in editing and formulating relations, making the imagination of new relations possible (Mouritsen & Hald, 2018). Mouritsen & Hald (2018) argue that accounting is a performable space that can be used for interpretation, while also being performative since it produces problematization. Accounting is the precursor of organizational transformation and development of innovation according to the authors. The incompleteness of accounting forces participants to make sense of it and add to it, consequently facilitating change and innovation (Mouritsen & Hald, 2018). This is relevant in the IIDM process, as the limitations and adaptations of accounting are important in understanding how decisions on resource allocation are made.

2.1.4. Corporate Sustainability Development and Challenges

Mikes & Metzner (2023) argue that since the signing of the Paris Climate Agreement in 2015, stakeholders have increased the pressure on companies to reduce carbon emissions. As such, more and more companies face the challenge of incorporating sustainability throughout their organizations (Boffo & Patalano, 2020). Sustainable development entails three interdependent dimensions, an economic, an environmental and a social one (Meadows, 1972; WCED, 1987). The economic dimension represents the interests of the company to prosper and be profitable, while the environmental dimension describes the need of the company to not do harm to their environment and follow jurisdictions, in order to emphasize the long-term impact (Benn et al., 2007). In the social dimension, the company needs to operate in a socially acceptable and sustainable way while improving the quality of life overall (O’Dwyer & Owen, 2005). Throughout history, the mixture of all three dimensions has become more relevant, surpassing the focus on the economical aspect (Hyršlová et al., 2015).

Since the Paris agreement, an increasing number of companies have committed to SBTi and have started deploying a carbon price or similar carbon accounting measures to adjust internal investment decisions (Mikes & Metzner, 2023). Mikes & Metzner (2023) show how the application of internal carbon prices is an important element to influence strategic decision-making, illustrating how a green transition can be facilitated by accounting. This also illustrates how carbon accounting is becoming more and more prevalent in organizations. Carbon accounting is defined as *“a system that uses accounting methods and procedures to collect, record, and analyze climate change-related information and account for and report carbon-related assets, liabilities, expenses, and income to inform the decision-making processes of internal managers and external stakeholders”* (Tang, 2017, p. 11). One of these systems is the internal carbon price that Mikes & Metzner (2023) highlighted. Unlike external carbon prices that are decided by governments or by supply and demand, internal carbon prices are set by the organizations themselves and as such are powerful tools for reducing emissions and incentivizing low-carbon activities (He et al., 2020). Carbon accounting has the potential to facilitate sustainability changes in the future, but to achieve this, He et al. (2020) argue that accounting must hybridize

with other disciplines to find appropriate solutions to the complex challenges within sustainability. He et al. (2020) stress that carbon accounting can be used to promote greener investments and projects, while also emphasizing that carbon decisions are affected by internal as well as external factors.

Addressing sustainability challenges requires relinquishing the emphasis on profitability according to Hahn et al. (2018). Instead, organizations should consistently address various interrelated, yet conflicting demands, for achieving economically prosperous, environmentally friendly, and socially equitable development paths. With a diverging focus from sole profitability towards the integration of the three sustainability dimensions, corporate tensions between the priorities become apparent in a company and its decision-making processes (Newton, 2002). A corporate tension can be defined as two phenomena that operate in a dynamic relationship that involves both competition and complementarity (Haffar & Searcy, 2017). These corporate tensions are mostly antagonistic, as the two opposing poles are naturally competing for corporate resources (Lewis, 2000; Smith & Lewis, 2011), accelerated through the fact that they are based on external stakeholders with varying perceptions that are in conflict (Hahn et al., 2015).

It is argued that companies need to pursue the conflicting aspects simultaneously in order to achieve corporate sustainability, although tensions can become stronger throughout this process (Lüscher & Lewis 2008; Hahn et al., 2015). Furthermore, Yuan et al. (2011) argues that rather than ignoring those tensions, it is even firm-wide beneficial to balance sustainability goals with corporate initiatives in order to achieve corporate benefits. Gao & Bansal (2013) and Hahn et al. (2015) stress that companies need to act on all three dimensions simultaneously, as interdependencies exist between them and not taking any actions would result in a non-desirable state.

According to Mikes & Metzner (2023), MCSs are an important facilitator of these strategies, stressing the importance of MCSs in enabling or limiting sustainability efforts. This was also shown by Arjaliès & Mundy (2013), who illustrate that a MCS has the potential to contribute to society's broader sustainability agenda. This is done through the facilitation of processes that enable communication, innovation, reporting and the identification of threats and opportunities (Arjaliès & Mundy, 2013).

Gond et al. (2012) address how MCSs can contribute to a deeper integration of sustainability within organizational strategy. Building on Simon's (1995) levers of control, Gond et al. (2012) describe that MCSs, and sustainability control systems (SCS) can have a diagnostic and interactive use in the integration of sustainability within organizational strategy. SCSs are formed as a result of MCSs limitations in addressing sustainability, consequently supporting, and facilitating organizational sustainability objectives. Gond et al. (2012) argue that a company's MCS and SCS should enable seamless integration of both financial performance and sustainability considerations. However, SCS remains in the periphery and decoupled from core business, subsequently having limited impact on reshaping strategy (Gond et al., 2012).

Beusch et al. (2022) apply Gond's (2012) theoretical framework and extend it through an inclusion of the two remaining levers of control from Simons (1995), namely belief and boundary systems. Beusch et al. (2022) results show that a firm can manage sustainability through making incremental changes in management control practices. First, in-depth discussions among managers at different levels and in various functions help in addressing sustainability integration challenges in a firm's value chain. Second, the commitment of a strategic-level manager to manage external sustainability factors has a direct effect on the development and promotion of sustainability-related products and services. Third, effective communication of sustainability beliefs by a dedicated management team prevents the sidelining of sustainability through dialogues across management levels (Beusch et al., 2022).

2.1.5. Integration of Corporate Sustainability in the IIDM Process

Although there's a growing research stream on how the increased sustainability focus of organizations affects different organizational processes (Gond et al., 2012; Beusch et al., 2022; Mikes & Metzner, 2023), few considerations on how the IIDM process has been affected have been made. Given the importance, that resource allocation is at the heart of understanding strategy (Bower & Gilbert, 2005), further research of the influence of sustainability onto the IIDM process is a necessity.

Corporate sustainability has historically not been a part of the IIDM process, nor has it been used in financial analysis (Hayat & Orsagh, 2015). However, a recent study by Frost & Rooney (2021) investigates the scope of sustainability consideration in the context of capital budgeting decisions. Frost & Rooney (2021) more specifically examine the individuals in organizations and how they measure and consider sustainability in the capital budgeting decision-making process. As capital budgeting is a widely accepted accounting technique (Frost & Rooney, 2021), it is important for a successful integration of sustainability into capital budgeting and IIDM to understand that accounting provides flawed measures of performance (Mouritsen & Hald, 2018; Frost & Rooney, 2021). To address that, Frost & Rooney (2021) stress the importance of incorporating non-financial knowledge and evaluation criteria into the process to avoid diminishing sustainability. Kimbro (2013) stresses that there are two approaches to integrate environmental risk into the financial calculations for IIDM, either by integrating a sustainability risk rate or calculating the sustainability cost NPV. The sustainability risk rate would be added to the discount rate of the project, subsequently penalizing non-sustainable investment by lowering the NPV. The other way, similar to the carbon cost line described by Mikes & Metzner (2023) is to estimate the sustainability cost NPV, which in practice means to deduct the NPV of sustainability costs on the financial NPV of the investment. While these possibilities exist to integrate sustainability in the calculations, there is evidence that most firms do not directly consider sustainability impacts in the IIDM process (Vesty, 2011).

Furthermore, Martin (2021) argues that personal sustainability opinions have a strong influence on decision-making in the presence of competitive pressure. Managers that are incentivized by CSR goals tend to implement higher cost CSR investments, although this might reduce the firm's profitability (Martin, 2021). Moreover, commonly accepted and applied capital budgeting techniques create a bias against the selection of sustainable alternatives in capital selection (Kimbrow, 2013). The tension between financial and sustainability concerns illustrates the difficulties of incorporating sustainability in investment decision-making (Frost & Rooney, 2021; Martin, 2021).

Vesty & Oliver (2014) analyze the way environmental and social factors are included in capital investments appraisals. The authors stress that sustainability can either have a direct or indirect impact on investment decisions, where indirect impacts can be intentionally or unintentionally ignored if not prioritized in the accounting modeling. Vesty & Oliver (2014) show that during the researched time period, only 27% of companies included sustainability impacts in the investment decision model. The lack of integration is further shown by Meyer & Kiymaz (2015), who find that companies start to proclaim sustainability actions, but the integration into the capital budgeting process is still limited as there is no clear consensus on an optimal approach (Vesty & Oliver, 2014; Meyer & Kiymaz, 2015). As such, decision-makers are disadvantaged without good practical guidance. Either accounting systems must adapt for investment decisions, or decision-makers can impose their own measurement and judgment criteria to include sustainability (Vesty & Oliver, 2014). This is in line with Grant & Nilssons (2020) findings, indicating that decision-makers expertise is important to create strategic and financial rationales for sustainability as well, leading to a strong influence of personal opinion in the decision-making process.

2.1.6. Identified Research Gap

Based on the literature review, an unfilled research gap becomes apparent for studies on how the increased importance of corporate sustainability affects the IIDM process and how the IIDM process manages potential sustainability tensions. Miller & O'Leary (2007) conclude that the scarce research on capital budgeting has been too stringent on financial valuation techniques, calling for greater attention towards a more comprehensive exploration of the managerial and institutional processes that surround investment decisions. Furthermore, Sureka et al. (2022) calls for empirics studying impact of economic, political, and regulatory systems on capital budgeting decision-making. While Frost & Rooney (2021) examine whether sustainability is considered in the decision process, there remains limited research on how corporate sustainability tensions are managed through the IIDM process.

Consequently, the integration of sustainability into the IIDM process remains largely unexplored. As such, this thesis answers researchers' calls (Bower & Gilbert, 2005; Hahn et al., 2018; Sureka et al., 2022) for future studies on resource allocation decisions and

strategy, more specifically, the integration of sustainability and the management of sustainability tensions through the IIDM process.

2.2. Method Theory

In research on corporate sustainability, many studies have taken on a business case perspective, aiming on translating and integrating sustainability into a business model (Hahn et al., 2018). This severely limits the scope and scale of sustainability development (Hahn et al., 2018), as it prioritizes financial performance over concerns for sustainability performance (Hahn & Figge, 2011). To avoid this and in order to shed light on the discovered research gap, a paradoxical perspective considering corporate sustainability tensions and their respective management will be employed. Smith & Lewis (2011) describes a paradox as contradictory yet interrelated elements that exist simultaneously and persist over time, or differently put, a persistent contradiction between interdependent elements (Schad et al., 2016). A paradoxical perspective is deemed appropriate as it serves as the conceptual groundwork for a corporate sustainability approach that embraces tensions, rather than avoiding them (Hahn et al., 2018). Furthermore, a paradoxical lens provides theoretical rigor as it compels researchers to contemplate about the origin and management of corporate sustainability tensions (Van der Byl & Slawinsky, 2015) and help advance theoretical debates (Schad et al., 2016). The method theory section will first introduce corporate sustainability tensions and how the potential characterization can be made. Successively, literature building on paradox theory and ways of managing sustainability tensions will be presented.

2.2.1. Corporate Sustainability Tensions

Smith & Lewis (2011) describe a possible categorization of tensions in an organizational context, by distinguishing between belonging, learning, performing, and organizing tensions. The authors describe paradoxical tensions as *“opposing yet interrelated dualities that are embedded in the process of organizing and are brought into juxtaposition via environmental conditions”* (Smith & Lewis, 2011, p. 388).

Building on the categorization by Smith & Lewis (2011), Hahn et al. (2015) developed a systematic framework that extends the definition of tensions in an organization through different levels, a temporal, a spatial and a context frame, while providing a framework of characterizing corporate sustainability tensions in an organization. Hahn et al. (2015) argue that tensions can not only arise between the different sustainability dimensions but also in relation to their context, in the change processes and inside the dimensions itself due to contrary goals. Whiteman et al. (2013), describe that tensions between hierarchical levels can stem from the fact that sustainability is a multi-level concept. As tensions are differently perceived between the individual, firm, and systemic level (Rousseau, 1985; Kozlowski & Klein, 2000), actions that satisfy the definition of one level can fail to address the needs of another (Hahn et al., 2015). Furthermore, tensions may arise between

individuals and thereby in decision-making processes due to individual perception of sustainability (Henriques & Sadorsky, 1999; Banerjee, 2001). The difference in the long-term focus of sustainability and the short-termism of corporate decision-making also creates tensions (Slawinski & Bansal, 2012). It means that companies tend to undervalue the long-term outcome of specific economic, environmental, and social aspects and in regard to the context (Hahn et al., 2015).

In 2016, Smith et al. published a categorization of strategic management paradoxes. The first being, innovation paradoxes, entailing tensions between the present and the future, existing offerings, and new ones, as well as stability and change. The second category involves globalization paradoxes, incorporating tensions between global interconnection and the commitment to local needs, collaboration, and competition. The last category are the obligation paradoxes, which describe the tensions between the maximization of profits for shareholders and maximization of benefits for a broader group of stakeholders (Smith et al., 2016).

2.2.2. Strategies to Tensions Management

When Smith & Lewis (2011) unveiled their findings on various organizational tensions, they introduced a comprehensive framework known as the "Dynamical Equilibrium Model of Organizing". This framework, as depicted in Figure 2, offers insights into how companies engage with these tensions and manage them over time.

The framework describes that tensions are constantly present within an organization, albeit in a latent state. It is only when factors, such as scarcity, plurality, or change occur, these tensions can render salient and become prominently visible and influential within the organization. How salient tensions are perceived and managed is dependent on many factors, where some of the main determinants are individual factors, such as cognitive and behavioral drive, as well as emotional stability. The willingness and acceptance of the persistence of the tensions will decide, if either a vicious cycle or a virtuous cycle helping the company to succeed spurs (Smith & Lewis, 2011).

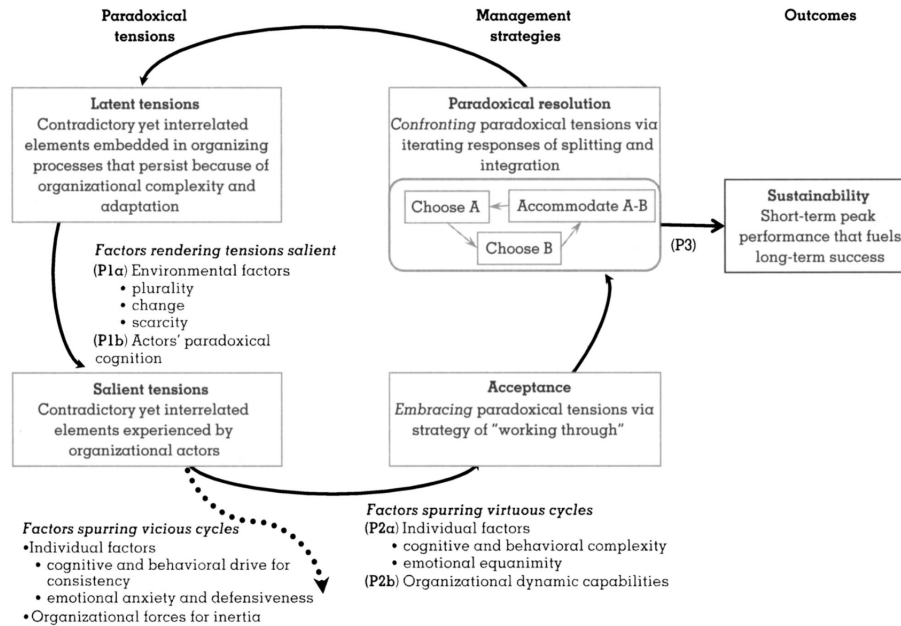


Figure 2. A Dynamic Equilibrium Model of Organizing (Smith & Lewis, 2011)

When a tension is acknowledged, and the need for change and active processes is recognized, the company and its stakeholders face a decision. They can choose to accept the tension as persisting, harnessing it for the organization's benefit, or opt to resolve the tension through confrontation in a paradoxical resolution strategy, through iterating responses of splitting and integration (Smith & Lewis, 2011). Furthermore, by pursuing a paradoxical resolution strategy, an organization can guide the tension towards a sustainable state for the time being, leading to "*short-term peak performance that fuels long-term success*" (Smith & Lewis, 2011, p. 388). These management strategies become valuable inputs for the organization and may give rise to new tensions related to the chosen strategy.

Hahn et al. (2015) further developed this framework by elaborating on potential resolution strategies for managing sustainability tension. Hahn et al. (2015) argue that a resolution strategy can take two main forms: synthesis or separation. In a synthesis strategy, a new element is introduced that effectively accommodates both poles of the tension through synthesizing the contrasting viewpoints. A separation strategy involves addressing the two tension poles at different locations or points in time. This strategy signifies that, after acknowledging a tension, a defined approach to handling the differing viewpoints and striving to satisfy them to a certain degree in different temporal aspects can also result in tension resolution (Hahn et al., 2015).

Concludingly, the method theory employed builds on Smith & Lewis's (2011) dynamic equilibrium model of organizing. The paradoxical lens will be used to analyze the IIDM process and how corporate sustainability tensions are managed through the process. Thus,

the identified research gap will be populated through a literature extension with empirics on the role of the IIDM process in the management of sustainability tensions.

2.3. Theoretical Framework

To analyze the management of sustainability tensions in the IIDM process, an abstraction of the Resource Allocation Process (RAP), described by Bower & Gilbert (2005), is expanded upon. This was deemed suitable for the aim of the thesis, as Strauch et al. (2019) emphasize that no holistic framework of the RAP has been published yet, while the theoretical underpinnings of the RAP model of Bower & Gilbert (2005) have stood the test of time. The adaptation of the revised RAP model by Bower & Gilbert (2005) is combined with the dynamic equilibrium model of Smith & Lewis (2011). This synthetization in a combined framework, shown in Figure 3, enables an in-depth analysis of corporate sustainability tension management through the IIDM process.

As depicted in Figure 3, the framework showcases an influence of the three contexts, Capital Market, Product Market, Structural and Strategic Contexts onto the process. Every context poses unique expectations and requirements towards the company. As those expectations can be conflicting in themselves, tensions arise between the expectations and requirements, e.g. a paradoxical obligation tension (Smith et al., 2016) exists in the capital market dimension when it requires better financial performance while also demanding investments into carbon-friendly alternatives. Tensions can also persist between contexts, for instance between the capital market and the product market context, as the capital market requests a high level of recurring revenues, which is opposed by the customers asking for lower prices. These elements are next to their interrelatedness, paradoxical. As highlighted by Smith & Lewis (2011), a decision for a certain management strategy is a decision against the opposite management strategy, thereby denoting a tension.

In this framework, it is argued that organizations actively engage with sustainability tensions, opting to either accept them or take measures to manage them. Moreover, the proposal of investments emphasizes these tensions, necessitating an acceptance or resolution strategy. As argued by Smith & Lewis (2011), tensions can become salient due to changes, scarcity, or plurality. The salience of tensions, in turn, triggers the motivation for investments, establishing a reciprocal relationship where tensions management and IIDM processes dynamically shape each other. The framework allows for the analysis of organizational tensions (Smith & Lewis, 2011; Hahn et al., 2015) as well as strategic paradoxical tensions (Smith et al., 2016). Consequently, the IIDM process has a crucial role in shaping the sustainability management strategy within the conceptual framework of Smith & Lewis (2011). The framework portrays its structure in four interconnected parts, creating a cyclical influence among them.

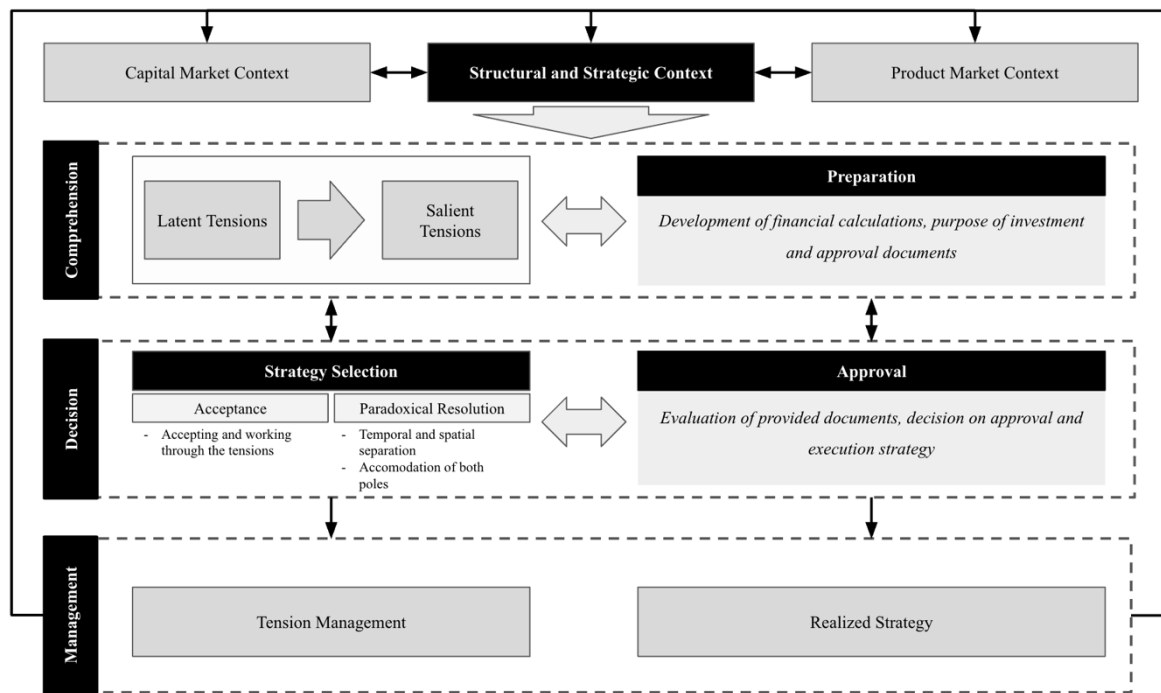


Figure 3. An integrated IIDM framework for managing corporate sustainability tensions. Synthesis of Bower & Gilbert (2005) and Smith & Lewis (2011).

Context

As outlined, various stakeholders hold diverse perspectives on a company and its activities. These distinct viewpoints serve as the foundation for the IIDM process. When focusing on sustainability, the context's focus is a three-way-fold of economic, environmental, and social sustainability. Through change in a set of expectations of a context, tensions can become visible, as plurality or scarcity of resources can arise between the different stakeholders or in the set of expectations of one stakeholder or the company's goals itself (Smith & Lewis, 2011; Hahn et al., 2015).

Comprehension

In the comprehension stage, the salience of tensions is acknowledged, thus forming a challenge for the organization that necessitates resolution or acceptance (Smith & Lewis, 2011; Hahn et al., 2015). Concurrently, investment opportunities are explored. This process is iterative, as communication between various departments and the communication along the approving hierarchy becomes a two-way exchange, allowing for adjustments in the project plan to better converge with the broader organizational goals. Moreover, this stage's progression is not solely driven by the emergence of salient tensions. Rather, it is entirely plausible that in a project intended to address one set of tensions, additional tensions arise, necessitating their inclusion in the ongoing dialogue and decision-making processes. Consequently, this stage lacks a predetermined path, as it continually influences and reshapes itself in various directions.

Decision

The decision stage builds upon the preceding phase of comprehension. It combines Smith & Lewis's (2011) acceptance and resolution strategies with the selection phase of Bower & Gilbert (2005), here referred to as the approval stage. The decision stage evaluates the extent to which an investment excels in managing respective tensions and is aligned with the company's strategy and the different contexts. This evaluation involves examining the project's capacity to address and navigate tensions, contrasting it with tensions it chooses not to resolve but rather accept. Simultaneously, it scrutinizes whether the proposed solution effectively guides tensions in a favorable direction. If the project's proposed outcome aligns with organizational goals, the investment or project will be undertaken, and a tension management strategy will be formed. Like the comprehension phase, this decision stage is iterative, as it requires ongoing assessment of tension management. Moreover, there exists a reciprocal relationship between the decision and comprehension stages. The decision stage influences the comprehension stage, as challenges identified during the decision process may necessitate a redefinition of the project's parameters, thereby initiating a feedback loop. This iterative dynamic underscores the interconnectedness of the two stages, as tensions continue to evolve, demanding a responsive and adaptable approach in shaping the organizational direction and the project.

Management

The outcome of the decision stage results in the execution of the realized strategy from the IIDM process and thereby the execution of the selected management strategy in the sense of Smith & Lewis (2011). This strategy directly addresses tensions through a resolution or acceptance strategy. The project's implementation, guided by the strategy, serves as input for the contexts, influencing and shaping their perception and expectations towards the company. Consequently, the management of the project has indirect influence on the next definition phase and subsequent IIDM processes of new projects.

Concludingly, the integration and adaptation of the revised RAP model by Bower & Gilbert (2005) with the dynamic equilibrium model by Smith & Lewis (2011), results in an integrative framework that highlights the role of the IIDM process in the management of corporate sustainability tensions. Through the application of this framework, this thesis aims to make a meaningful contribution to the literature on IIDM processes and its significance in shaping a company's strategic decision-making in regard to overall sustainability.

3. Methodology

After showcasing the theoretical framework that will be utilized to comprehend the findings and contribute to the research domain, this section will describe the research methodology employed to gather the empirics. First, the research design will be presented. Second, the data collection process. Third, a description of the data analysis process and lastly, the validity of the thesis will be elaborated upon.

3.1. Research Design

To gain a comprehensive understanding of the research area and to fulfill the aim of this thesis, of analyzing how corporate sustainability tensions are managed through the IIDM process, a qualitative study was selected, as it provides detailed data, essential to understanding the mechanics behind the researched phenomena (Dyer et al., 1991). Subsequently, an interpretive research design was chosen, which Neuman (2000) explains as a methodical examination of socially meaningful actions, by directly and meticulously observing individuals in order to gain insights and interpretations of how people create and maintain their social worlds. The interpretative research approach sees that *“social reality is emergent, subjectively created and objectified through human interaction”* (Chua, 1986, p. 615). In line with interpretative research design described by Chua (1986), the researchers believe that all actions have a meaning and intention that are grounded in social and historical practices. Furthermore, the interpretive research design is aligned with a qualitative study using a case study to gather empirics (Chua, 1986).

The study was conducted as a single case study rather than a multiple case study. Following the argumentation of Siggelkow (2007), which illustrates the power of a single case study through an adapted example from Ramachandran (1998). It is emphasized that the persuasiveness and validity of a case study do not solely depend on the size of the sample, rather, *“a single case can be a very powerful example”* (Siggelkow, 2007, p. 20). Dubois & Gadde (2002) further argue that learning from a particular case should be considered a strength rather than a weakness, as it allows the researchers to gain a comprehensive understanding of the researched phenomena.

The selection of case company was based on the researchers' interest in the challenges of integrating sustainability in organizational processes. Therefore, a case company that aims to further integrate sustainability and faces challenges doing so was selected. In addition, the accessibility of the case company was enabled by the company themselves, as they inquired about more research in the domain to gain practical insights. Furthermore, as the case company has committed to SBTi and aims to integrate sustainability into their IIDM process, the company was considered a good representation of the phenomena. Given this, the chosen method of a single case study is considered both fitting for the aim of this research paper and in line with previous research.

3.2. Data Collection

The empirical data was collected through interviews with 30 employees at the case company. 18 interviews were held in person in either Stockholm at the group headquarter or in another major European city where the company has clustered many functions. 12 interviews were held online due to geographical limitations. All interviews were conducted during October 2023 and the average duration was 54 minutes. A list of each interview is available in Appendix A. Interviews were held with employees at each respective business areas of the case company. This was deliberate, as the IIDM process is standardized, but the possible tensions and consequently their management can differ between the business areas. As tensions can occur at different organizational levels (Smith & Lewis, 2011) and the IIDM process is a multilevel phenomenon (Bower & Gilbert, 2005), interviews were conducted with organizational members at different hierarchical levels. This allowed for a complete understanding of the IIDM process and how corporate sustainability is seen and consequently managed through the IIDM process. In order to further obtain a holistic understanding, interviews were also held with employees in the group function. The interviews were complemented by external documents and also through internal documents shared with the researchers. These include the case company's guidelines, investment application form, carbon calculation tools, as well as project specific data and presentations. This was made possible through the signing of a non-disclosure agreement (NDA) by the researchers and supervisor. As a consequence of the NDA, internal data and presentations will be discussed but not shared explicitly.

The interviews were held in a semi-structured way in order to leave room for flexibility, subsequently allowing the researchers to better understand the perspectives of the interviewees (Bell et al., 2019). Semi-structured interviews is a proven interview technique and is both the most common of all qualitative research methods (Alvesson & Deets, 2000) and the most effective way of gathering information (Kvale & Brinkmann, 2009). The semi-structured interview approach was deemed suitable, as it involves prepared questions guided by identified themes, with probes designed to extract more elaborated responses (Qu & Dumay, 2011). Furthermore, this format is flexible, accessible and has the potential to reveal underlying facets of human and organizational behavior (Qu & Dumay, 2011). This ethnographic research approach allows the researchers to understand the way the interviewees perceive the studied subject (Qu & Dumay, 2011), meaning how sustainability is integrated in the IIDM process and how possible tensions are managed through the process.

A general interview guide was prepared, which is available in Appendix B. The general interview guide was adapted for each interviewee based on their area of expertise and responsibilities, and whether they approve or prepare investments. For instance, engineers were explicitly asked about product development and tensions in this IIDM process, while controllers were asked about capital investments and if they are an approver, how sustainability was integrated into their decision-making. Following Dubois & Gadde

(2002), the interview guide was dynamic and was continuously updated when interesting empirical themes developed. The day before each interview, all interviewees received a condensed version of the interview guide, which outlined the aim of the research paper and preliminary discussion points. In order to avoid the interviewees preparing answers and not providing their initial and honest reactions, no actual questions were included in the condensed interview guide. All interviews began with an introduction of the interviewers and the research domain, as well as confirming full anonymity and that the researchers signed NDAs. Then introductory questions were asked to the interviewee, intending to help the interviewee loosen up and be more comfortable (Qu & Dumay, 2011). The interviews were guided by interviewees' answers and the researchers' follow-up questions, probing questions, direct questions, interpreting questions and structuring questions to move from one theme to another (Qu & Dumay, 2011).

3.3. Data Analysis

In line with recommendations by Dubois & Gadde (2002), this thesis adopted an abductive research process. The abductive approach differs from the inductive approach where theory is generated from data, as well as the deductive approach which develops propositions from current theory and tests them in the empirics (Dubois & Gadde, 2002). Rather, the abductive approach focuses on the generation of new concepts and theoretical development of models. In the abductive research process, *"the original framework is successively modified, partly as a result of unanticipated empirical findings, but also of theoretical insights gained during the process"* (Dubois & Gadde, 2002, p. 559). The framework of this research paper was continuously under development and allowed the researchers to adapt the interview guide. This process is by Dubois & Gadde (2002) referred to as systematic combining, which consists of matching theory and reality, as well as the direction or redirection of the study.

During the period where the interviews were held, the researchers started coding the empirics to see what empirical themes developed and adjusted the theory with the gained knowledge about both the theory and the empirical phenomena, in line with Dubois & Gadde (2002). For instance, initially the full revised model of RAP (Bower & Gilbert, 2005) was seen as a potential part of theoretical framework. However, the empirics redirected the study to focus more on corporate sustainability tensions and how these are managed on a process level, rather than between hierarchical levels. The theoretical framework was therefore adapted and modified to increase generalizability and better capture the different stages in IIDM processes. This example illustrates how the researchers alternated between empirical findings and theory, subsequently increasing the understanding of the empirical setting as well as the theory (Dubois & Gadde, 2002).

To comprehend and describe the data analysis process, all interviews were transcribed and coded to different empirical themes. By grouping empirical themes the researchers were able to match these against current theoretical themes, as well as new theoretical

themes. The coding and matching of the empirical material presented a holistic overview that enabled the selection of what empirics were of most importance for the researched phenomena. Through an open coding process, all projects for capital investments and product development were structured and analyzed.

3.4. Validity

Validation refers to how credible academic research is and whether it is legitimized (Lukka & Modell, 2010). Classic quality criteria in quantitative research, such as objectivity and internal- and external validity are only partly applicable to qualitative research (Lukka & Modell, 2010). Instead, alternative criteria for evaluating qualitative studies have emerged (Messner, Moll & Strömsten, 2017). Lukka & Modell (2010) stress that authenticity and plausibility are two central aspects of validation of qualitative research. Similarly, Messner, Moll & Strömsten (2017) refer to credibility and authenticity as two criteria for evaluating validity. Based on the criteria presented by Messner, Moll & Strömsten (2017), the validity of the thesis will now be discussed.

A study is authentic if it *“skillfully exploits the richness of the empirical material rather than providing only highly condensed findings”* (Messner, Moll & Strömsten, 2017, p. 436). An authentic account can first support the credibility of the findings, but it is also important as a communicative tool for the reader to be able to grasp the findings. According to Messner, Moll & Strömsten (2017), the way interviews are conducted can facilitate authenticity, for instance through asking interviewees for concrete examples. Another important element of authenticity is how data is presented (Lukka & Modell, 2010; Messner, Moll & Strömsten, 2017). In a single case study, as in this thesis, Messner, Moll & Strömsten (2017) argue that one could expect more detailed and richer empirical evidence, through direct quotes and observations. The suggestions by Messner, Moll & Strömsten (2017) and Lukka & Modell (2010) were followed in the thesis, leading to detailed examples and descriptions from interviewees being collected and presented, to anticipate and highlight several perspectives.

Credibility refers to how convincing qualitative findings are (Lincoln & Guba, 1985). According to Lukka & Modell (2010) this is both a matter of the strength of the empirics and the plausibility of the theoretical interpretation. A way of increasing credibility is through triangulation, which refers to the use of multiple and different sources of data to strengthen the account (Messner, Moll & Strömsten, 2017). This was ensured through conducting interviews at different hierarchical levels at the case company, subsequently also increasing the researcher’s exposure to the empirical field, which is another strategy to increase credibility (Messner, Moll & Strömsten, 2017). In conclusion, the researchers argue for the validity of this research paper, since both credibility and authenticity are ensured throughout the study.

4. Empirical Analysis

In this section the empirical findings will be presented. It starts with an introduction of the case company, which is followed by a description of their respective sustainability considerations and targets. Followingly, the IIDM process at the case company for both capital investments and product developments is presented. Additionally, to the description of each process, the empirical analysis of the respective theme and the management of present sustainability tensions will be presented, followed by an exploration of determining factors. The section concludes with a summary of the management strategies by each process.

4.1. The Case Company

The case study was conducted on a large Nordic industrial company, hereafter referred to as PlanetCo. PlanetCo has more than 40.000 employees in over 70 different countries and produces yearly revenues in the 10th of billions of Euros.

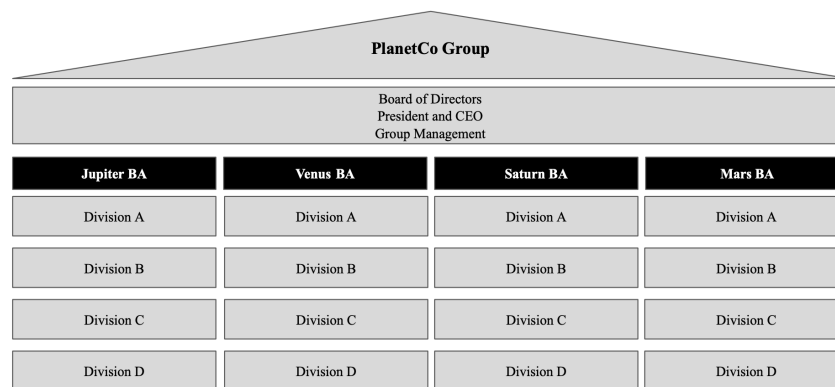


Figure 4. Schematic Illustration of PlanetCos Organizational Structure

The revenue is generated by four decentralized business areas (BAs) that are responsible for developing their respective operations by implementing and following up on strategies and objectives. These four BAs are hereafter referred to as Jupiter BA, Venus BA, Saturn BA and Mars BA. The BAs are complemented by a finance organization in order to consolidate the financial results and provide strategic guidance on a higher level towards the divisions. Furthermore, most of the BAs have dedicated departments for sustainability topics that are actively supporting the divisions in these belongings.

The divisions are internally referred to as the highest operating units within PlanetCo, reason being that they are responsible for their distinct product lines and generate their own P&L. Each division has global responsibilities for a specific product or service offering. Furthermore, a division can have one or more product companies, distribution centers, customer centers, or share these together with other divisions within the BA,

depending on country and region. Moreover, the divisions are not obliged to have a dedicated sustainability manager or similar in their organizational set-up, some of them do. Lastly, PlanetCo is completed by a group function, which is responsible for the consolidation of the operating results, providing strategic guidance and setting the strategy and targets, including sustainability targets, as showcased in Figure 4.

4.1.1. Sustainability Considerations and Targets at PlanetCo

The case company considers itself to be part of the solution for a better tomorrow. In 2019, PlanetCo committed to the Science Based Targets initiative (SBTi) that are in line with the 2015 Paris Agreement. PlanetCo's main goals are in the areas of people, safety and well-being, the environment, product and service, financials, and ethics in order to produce a full-ranging sustainable impact. PlanetCo mostly produces industrial-used products that have a long lifetime. Subsequently, the primary environmental impact of PlanetCo arises during the usage phase of their products, wherein electricity or fossil fuels are required for operation. Providing context to their emissions, it is noteworthy that approximately 90% of PlanetCo's CO₂ emissions occur during the usage phase. This underscores the significance of Scope 3 emissions, particularly downstream emissions, which constitute the vast majority of PlanetCo's environmental footprint. In response to this, PlanetCo has established a group-wide goal, applicable across all business areas and divisions, to reduce overall Scope 1 and 2 emissions by approximately 50% and Scope 3 emissions by nearly 30% by the year 2030, compared to a baseline set in 2019. As of the latest figures presented in 2022, there has been a decrease of approximately 30% in Scope 1 and 2 emissions, juxtaposed with an increase of over 29% in Scope 3 emissions. Thus, also providing the basis for the tensions analyzed. As the greatest impact that PlanetCo can do is in the reduction of emissions and thereby complying with their targets, the main tensions focused on in the analysis are within and between the environmental and economical dimension of sustainability, not in the social dimension.

4.2. The Internal Investment Decision-Making Process at PlanetCo

Subsequent to the introduction of the case company and their sustainability goals the empirical findings in the IIDM processes at PlanetCo will be displayed. Therefore, this section is split into two parts, first the IIDM process of capital investment and secondly the IIDM process for product development. These two processes were chosen due to their respective considerations of Scope emissions. While the main focus in capital investments lies in Scope 1 & 2 emissions, the product development process focusses on Scope 3 emissions. Each of the two IIDM processes will be explained in detail and linked to the theoretical framework of section 2.3, followed by empirical observations of projects and an exploration of determining factors that led to the respective management strategies.

4.3. Internal Investment Decision-Making Process for Capital Investments

At PlanetCo, capital investments mostly consist of investments into new machines, energy efficiency, new buildings and projects on changing the structure of a site. When an investment is to be made, the monetary amount required and the position of the preparer decide who will approve the financing. The general manager of the specific site has a procurement right of approving an investment of up to SEK 500.000. If an investment is greater than that, the approval hierarchy presented in Figure 5 applies.

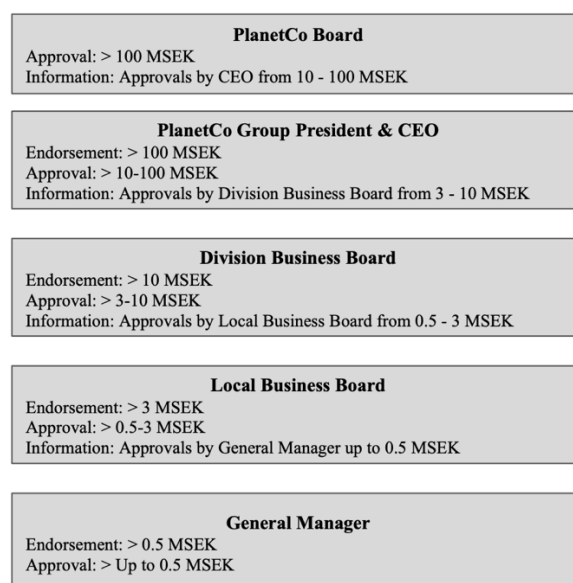


Figure 5. Approval Hierarchy at PlanetCo

For each investment, independent of the investment size, a business case in the form of an investment application form must be presented, which includes an NPV-calculation and a payback period. This business case calculation has several levers that will be adjusted in accordance with the geographical region, technology risk, investment risk and product risk. Moreover, environmental sustainability shall be considered in a quantified way, as a CO2 emission saving and emissions line is included, which positively impacts the NPV if there are CO2 savings, and vice versa.

The group's reason for introducing a financial cost of carbon is that: *“As a Group, we aim to reduce our environmental impacts, lower our carbon emissions, and reduce future risk from external carbon taxes. Including a financial cost of carbon in this form encourages environmentally sound investments.”* (Internal documents). This integration of quantified CO2 emissions into the NPV calculation was introduced in 2019, simultaneous to the commitment to SBTi targets. Since 2019, the price is set at €100 per ton CO2 emission. Through this CO2 line in the calculation, emissions can either worsen or improve the perceived economic benefit for an investment, as illustrated in Figure 6. A normal investment at PlanetCo should deliver a payback period of approximately three years. For major investments, such as a new production site, the payback period requirements are

adjusted on a case-by-case basis. Exceptions are also made for specific investments into sustainability of the company, especially for health and safety investments as these are considered “*a cost of running a business*” (Interviewee #24).

Application: Project X										
Risk-adj. WACC:	10.5%	Economic life (years):								
Currency:	EUR	Pay-back period (years):		5,4						
SEK/EUR:	11,142	Pay-back period incl CO2:		5,0						
Yearly inflation:	2%	Start year:		2024						
Start		Start month:		January						
Investment	Year	2024	2025	2026	2027	2028	2029	2030	2031	2032
Total Investment		1.911.000								
Net Investment		1.911.000	0	0	0	0	0	0	0	0
Operating Costs										
Maintenance and repairs (-)		-21.400	-21.828	-22.265	-22.710	-23.164	-23.627	-24.100	-24.582	-25.074
Total cost		-21.400	-21.828	-22.265	-22.710	-23.164	-23.627	-24.100	-24.582	-25.074
Savings / Revenues										
Savings on Energy at 150Eur Hour		377.100	377.100	377.100	377.100	377.100	377.100	377.100	377.100	377.100
Total savings / Revenues		377.100	377.100	377.100	377.100	377.100	377.100	377.100	377.100	377.100
Change in Working Capital										
Total Benefit, period		355.700	355.272	354.835	354.390	353.936	353.473	353.000	352.518	352.026
Net Cash Flow, period		-1.555.300	355.272	354.835	354.390	353.936	353.473	353.000	352.518	352.026
Accumulated Net Cash Flow		-1.555.300	-1.200.028	-845.193	-490.802	-136.866	216.606	569.606	922.124	1.274.151
Net Present Value		1.296.702								
Carbon emission impact, tonnes		-311	-311	-311	-311	-311	-311	-311	-311	-311
Financial impact from carbon emission		31.125	31.125	31.125	31.125	31.125	31.125	31.125	31.125	31.125
Net Cash Flow incl CO2 impact (19+23), period		-1.524.175	386.397	385.960	385.515	385.061	384.598	384.125	383.643	383.151
Accumulated Net Cash Flow		-1.524.175	-1.137.778	-751.818	-366.302	18.759	403.356	787.481	1.171.124	1.554.276
		363	363	363	363	363	363	363	363	363
Net Present Value incl CO2 impact		1.579.789								

Figure 6. The Investment Application Form for Capital Investments

In addition to the investment application form a presentation is prepared, which includes the motivation, facts, and timeline for the project. Depending on the level of approval, this presentation is more refined. After the approval, the business area or division will lead the project and provide updates in monthly or quarterly follow-up meetings. In case of subsequent investments in already approved projects, a new investment application is started. It is worth mentioning that this process is strongly demand driven and that investments that are in line with SBTi receive financial leeway, resulting in less stringent payback requirements. The degree of financial leeway is not specified.

Transferring this process into the theoretical framework, presented in section 2.3, it becomes visible, that the comprehension stage aligns with the combination of the search for an investment, and with the preparation of the investment application form and the presentation. This comprehension stage is normally initiated by an employee from the operational divisions, following a need for a new machine or more dedicated investments. In this stage, the idea will be aligned with the corporate goals and guidelines and the salience of the tensions apparent through the definition of the investment, or as the driver of the investment. In the decision stage, the presentation and the business case will be presented, and a decision is made by the responsible approvers if resources are to be allocated. Successively, the decision stage also agrees on a strategy for the management of the sustainability tensions and an execution strategy for the investment.

4.3.1. Sustainability Tension Management within the Capital Investment Process

After showcasing the alignment of the capital investment IIDM process with the theoretical framework in section 2.3, this section will elaborate on two observed projects that were in focus throughout many of the interviews, namely: 1) *China Relocation Project* and 2) *Master Planet Project* (Table 2). To analyze the specific projects, the influence of the different contexts onto the process will be showcased and the formation of specific sustainability tensions explained. Followingly, the setup of the preparation will be explained before the decision stage and management strategy are explored.

Table 2. Summary of the Two Capital Investment Projects

	<i>China Relocation Project</i>	<i>Master Planet Project</i>
<i>Context Stage</i>	PlanetCo must relocate a site due to commercial and governmental pressures, with expectations for swift execution, strategic alignment, and minimal environmental impact.	PlanetCo has a commercial need to increase production site capabilities, while relocation was deemed unsuitable. Legislation required a certain % of solar panels on new buildings.
<i>Tension</i>	A paradoxical sustainability tension arises between environmentally friendly execution and the need for a rapid process, pressuring cost and revenue expectations, potentially harming the goal itself.	A paradoxical sustainability tensions arises between commercial expansion need and sustainability integration goals.
<i>Comprehension Stage</i>	In the preparation stage, relocation is chosen due to external pressures and geographical constraints, with ecological sustainability not being actively considered due to uncertainties.	In the preparation stage, controllers face challenges in measuring CO2 emissions, resulting in sustainability not being included in the investment application. Measurability issues combined with low hypothetical financial impact contribute to preparation complexities.
<i>Decision Stage</i>	The decision stage prioritizes financial considerations, with ecological sustainability given a temporal dimension for later formulation of explicit guidelines and application.	The decision stage involves a spatial and temporal separation of the tensions. A dynamic resolution strategy defers detailed sustainability considerations through temporal separation into a later stage and space.
<i>Management Stage</i>	The outcome of the IIDM process is that the relocation project began and efforts to find energy-saving solutions started after approval of resources. Through temporally separating the poles of the tension, the corporate sustainability tension was managed.	In the management stage, subsequent IIDM were initiated to integrate sustainability cohesively and comply with regulatory requirements. Temporal and spatial separation managed the corporate sustainability tension.
<i>Determining Factors</i>	Conflicting expectations for swift execution and environmental friendliness create a paradoxical tension, where quantification issues of CO2 emissions lead to an initial prioritization of financial considerations and postponed ecological considerations.	Tensions are paradoxically managed through spatial and temporal separation due to measurement difficulties and hypothetically low impact on NPV, combined with strategy guiding the direction instead. When not spatially and temporally separated, economic considerations take precedence, such as the decision against implementing geothermal heating, consequently not managing the tension.

4.3.2. China Relocation Project

The first observed project is the relocation of a production site in China. The decision to move was taken due to a lack of opportunity to grow in the current facility, reinforced by the governmental plan to expand the adjacent residential area. In discussions with the government, a new possible location for the site and subsidies were agreed upon: “*The government has indicated that actually they would not really be supportive to extend in the current location because it was already close to the residential area that they have been constructing over the past few years*” (Interviewee #1).

The structural and strategic context formed a clear expectation toward the relocation project, emphasizing the need for a swift execution to prevent production downtime. Additionally, the new site was expected to align with the company's strategy and should

not exacerbate the environmental impact of the operations. The capital market dimension necessitated that PlanetCo continues to fulfill the ambitions previously set and communicated to the capital market. Furthermore, the production downtime should be minimized, and the new site should enable an increase in both revenues and production. Additionally, there have been concerns regarding the environmental sustainability of the new site, as the capital market dimension required a higher degree of sustainability for the company to meet its goals. Evidently, the product market dimension demonstrated a keen interest in both the environmental impact of the site and its contribution to clients' Scope emissions. Moreover, the relocation itself garnered significant attention, given its potential to affect delivery times, alongside concerns about production downtime.

“Customers start to pay more attention. For example, we recently had a visit of a company. They came recently to our factory, to evaluate our performance. So, 30% of the score will come from their evaluation of your ecological performance. So, it becomes a differentiator.” (Interviewee #1)

The convergence of these expectations towards the project creates a paradoxical obligation tension. On one hand, the contexts stress the necessity for a meticulous execution that involves an increase in the environmental friendliness of the new site. On the other hand, there is an emphasis on the need for a rapid process, limiting the thoroughness of the execution and furthermore exerting pressure on the cost and revenue expectations from the project, underscoring the need for a resourceful project. Consequently, prioritizing one aspect over the other would potentially de-emphasize other expectations. It could potentially even lead to the deterioration of the objective itself. For instance, focusing on a fast execution bears the risk of introducing flaws, potentially resulting in an outcome contrary to the intended goals and thereby forming a paradoxical tension.

In the comprehension stage, the project was formed in alignment with the structural and strategic context's expectations of growth and strategy fulfillment. Therefore, multiple options, like a brownfield approach were considered, but in discussions with external parties only the option of moving and building new was deemed suitable.

“There were some options, but it is always difficult to make them a good layout. So in the end, we decided that we would look for a greenfield new factory and then we could do more of an integrated factory, also bringing in some other activities [...] that are currently located in Shanghai. But then we were looking for a big plot of land, so we looked at different options. The government sometimes offered us some pieces of land. In the end, there was one option, which is a good option from the perspective that the land size plot is okay” (Interviewee #1)

Leading to this option being translated into a business case and a presentation. Whereby the arguments were mainly considering the operational and cost part of the site and not explicitly the degree of ecological sustainability of the new site.

“There were no real details about that (Ecological sustainability). That was more, on the level of the divisions that were looking at that. And the case that was presented to the board was purely financial” (Interviewee #1)

“For investment application, we didn't really include the environmental impact at that moment. Because for that, actually, if we can use it in a very good way, then we also have the payback. So we decided to make a separate investment application” (Interviewee #4)

In the decision stage, the choice was based on the financial cost and revenue predictions of the site, considering the relocation synergies of different operational units. At this point, environmental sustainability was not actively considered nor concretized, but was instead given a temporal space, as emphasized by the site's manager:

“So actually after we got the go-ahead from the board we went into more detail because we first of all had to know also how the buildings would be in principle and what activities we would have there and then based on that we started to map” (Interviewee #1)

Highlighting that the IIDM process addressed the ecological and financial sustainability tension of the obligation paradox by assigning a different temporal dimension in this instance. Following the approval of resources for the overall project, guidelines for sustainability integration and investments were formulated, initiating the optimization process.

“We had a discussion, what our ambitions should be when it comes to different aspects and one of the aspects was the ecological aspect. And then in the end, we reached a kind of consensus that we are not aiming for being LEED certified, but we want to have the building and the facilities as efficient as possible, while still looking for a payback on extra investments. So that was very clear. And so they said, we want to strive for a very efficient operation when it comes to energy and operations in general. And we are ready to invest a bit on it, but there has to be a payback on it also” (Interviewee #1)

In the management phase of the project, the relocation process was initiated while the search for the most efficient energy saving solutions for Scope 1 & 2 started in a subsequent manner. This was done through establishing an energy efficiency team that: *“Started mapping what we had in our current factory to quantify. And then we were going step by step, where can we reduce, where we can reuse, etc. So we did both for the electricity and then we also had the exercise for the water”* (Interviewee #1). This team developed a sustainability strategy that included a decision for solar panels, which was agreed on through a new investment process accordingly. Through temporally separating the poles of the tension, both elements were accommodated and managed.

4.3.3. Master Planet Project

“But moving to another location is a nightmare. On the other hand, purchasing a new location here doesn't make sense because it's far too expensive. So from that perspective, the idea was here, let's make the current plot as usable as possible or integrate as much as possible in the current plot.” (Interviewee #20)

The second project covered during the interviews was the extension of one of PlanetCo's biggest production sites in central Europe, which is here referred to as “The Master Planet Project”. The Master Planet Project consisted of replacing a space inefficient parking lot with a new parking house, consequently freeing up more space to increase production capabilities and simultaneously improving the Scope emissions of the site through solar

panels, heat capture and improved isolation. At the production site, three of the BAs are situated, however for the Master Planet Project a division at Jupiter BA championed the investment proposal. The investment procedure followed the normal IIDM process for capital investments outlined in section 4.2.1.

In comparison to the China Relocation Project, the Master Planet Project had diverging strategic and structural contexts. PlanetCo had grown out of the current site and there was a commercial need to increase the capacity. The production site is one of PlanetCo's oldest and most important sites, which made relocation unfeasible. This was described by the project leader *"We have been here for a long period of time, so a lot of habits and things are set up to run the plant in this location, we have an outbound system, and the location is a good location... moving this plant to another location, yeah, that's a nightmare"* (Interviewee #20). Expansion of the current site, instead of a green- or brownfield investment at another location has both its pros and cons. In the context of sustainability, Interviewee #20 described it as: *"It's better to expand than to fully renew, but of course you have the burden of the past. The old building that you cannot change. So, from that perspective, sustainability measures are a little bit different here than what we do in a new plant"*. The product market and capital market contexts influenced the Master Planet Project as well, Interviewee #8 stressed this through an example: *"Imagine a customer of ours comes to us and asks us about sustainability. There's a lot of things that you can talk about. PlanetCo is a big organization; we have a lot of projects that positively contribute to sustainability [...] a large reason for taking sustainability projects on board is to be accepted by our customers as a company to do good business with"*. Furthermore, due to new regulations, solar panels had to be installed as part of the Master Planet Project in order to be compliant:

"For example, here there's a new law that says companies with over so many employees or so much revenue need X percent of their surface covered by solar panels. We just asked the board for approval to invest 1.9 million euro or something in solar panels to put on the roofs here, to get to that minimum surface with solar panels cover. But that's not really debated then. And in this case, either you stop your operations here, or you comply and you put the solar panels" (Interviewee #8).

The need for increased production capabilities at the site and legislative requirement on solar panels, in combination with the need of a substantial monetary investment for the execution, made the tension between economical and sustainability benefits become salient and formed a paradoxical obligation tension. Moreover, as the investment was commercially driven but demanded significant monetary resources, the tension between financial long- and short-term performance became salient, thereby demonstrating the emergence of a paradoxical innovation tension.

In the comprehension stage, the controllers ran into the issue of measurability for CO₂ emissions in the proposed investment: *"How much more will you save due to isolation? It's fluctuating of course, day after day, month after month, year after year. And sometimes it's quite difficult to calculate, so you have to make a lot of assumptions there"*

(Interviewee #22). In addition to the measurability issues, the impact on the financial calculation by adding a carbon cost is limited: *“Look, if the payback is, let's say for the investment is 2.9 years, considering the CO₂, it may come down to 2.8 years or 2.7 years. So, it is a marginal impact in these big investments* (Interviewee #19). The measurability issues, combined with the hypothetically low impact on the NPV and payback period, led to corporate sustainability not being included in the investment application form or in the presentation.

“So, there were no CO₂ impacts in the investment application, there was no CO₂ impact on the presentation. There was nothing mentioned for approval” (Interviewee #22).

However, sustainability was still considered, *“we looked at sustainability from an operational point of view”* (Interviewee #22). Energy efficiency in the form of solar panels was a major part of the Master Planet Project, along with improved isolation, heat capture technology and even geothermal heating, although the latter was not implemented due to economic reasons and the approver being of the opinion that more efficient options will be available in the future: *“And having such a really bad business case, he said [the approver], this doesn't make sense. We think that there will be better things coming in the future”* (Interviewee #22). At the comprehension stage, sustainability was thus considered and discussed internally in the division, however these considerations were not communicated to the approvers in the IIDM process.

Due to the substantial monetary investment needed for the project, the approval was made by the PlanetCo board. In the decision stage of the IIDM process, the obligation tension was resolved by spatial and temporal separation, implementing a paradoxical resolution strategy. It was decided to allocate capital towards the project and start with the redesign of the site on the basis of the financial calculations. Sustainability considerations were given a different temporal dimension due to the lack of information at the time. In the case of geothermal heating, spatial and temporal separation were not applied, as the economic benefits were set in relation to the CO₂ savings, consequently leading to the prioritization of the business case and resources not being allocated to it. Meanwhile, the innovation tension within the economical dimension was accepted through discussions and the decision of undertaking the project, rather than assigning a resolution strategy. In the execution of the project, subsequent investment decisions were made in order to incorporate the sustainability aspect in a cohesive way. The resolution strategy allowed PlanetCo to attend the competing demands without favoring one over the other, with sustainability being thoroughly considered but not included in the preparation or approval stage, but rather spatially and temporally separated to the management stage.

4.3.4. Determining Factors for Tension Management in the Capital Investment Process

The two projects display similar approaches towards the management of corporate sustainability tensions in the IIDM process of capital investments. In the China Relocation Project, the resolution strategy was to assign sustainability considerations to

a different temporal dimension and postpone it, while concentrating on the financial cost and the relocation itself in the first step. In the case of the Master Planet Project, CO2 emissions were not quantified in the preparation stage or included in the presentation to the approval stage, subsequently facilitating the decision to manage the tension by spatially and temporally separating the two dimensions of the tension. Followingly, three determining factors of the tension management strategy will be explored.

The intricacies of quantifying CO2 emissions

The first observed determinant of management strategy is the inclusion of the CO2 emission calculation for Scope 1 & 2. The carbon cost line in the investment application form is applicable for all investments and standardized throughout the group. The intention is to allow approvers to make a quantified judgment of a proposal and thereby provide an opportunity to consider the environmental impact early in the process. The interviewed approvers prefer to base their decisions on quantified figures, for instance Interviewee #1 stressed that: *“I would still prefer to stick to hard numbers, that you can calculate, that you can prove, that you can evaluate later on, rather than to say, okay, how much extra orders did we get because we do this or that, which is very difficult to quantify”*. However, as shown in the empirical examples, the judgment of the CO2 impact is not explicitly made in the calculation of the business case, rather a paradoxical resolution strategy was chosen to postpone sustainability considerations into another spatial and temporal dimension.

One reason for this is the challenge in quantifying CO2 emissions, especially in the early stages of a project, as explained by Interviewee #22 for the Master Planet Project: *“So we go to the board quite early for approval and the first permits are currently in, almost 1,5 years later. That means the design is only finished now. That means we can only know the CO2 impact when the design is finished. But we already have to get an approval on amounts before. So, if I have to fill in a CO2 amount, that's one hell of a job if I have no idea how the building will look like. I have kind of an idea, but you have no idea how many piles are needed, how many rooms, what are we going to put in, etc. etc.”* This illustrates the problem of CO2 integration in the calculations made in the preparation stage, thereby nudging the decision stage towards a temporal separation strategy to manage the tension.

Furthermore, Interviewee #22 summarized the usage of the emission quantification in the investment application as follows: *“Most of the time we utilize it when we have for example an investment in solar panels. The business case there is that you are going to utilize less energy. So having a business case is 6-7 years payback on solar panels. And this environmental impact of 100 euros to create a business case that was a little bit better. So, if it is to my advantage, I fill it in. If it is to my disadvantage, I do not fill it in”*. Illustrating that in capital investments the quantification of CO2 emissions is used opportunistically when the quantification is feasible and favorable for the project. In cases

of uncertainty and complexity, a different spatial and temporal dimension is assigned towards sustainability and management strategy considerations, as in the case of the China Relocation Project:

Interviewer: "I'm thinking about these discussions around corporate sustainability, were they held in the beginning before the investment was approved or were those after?"

Interviewee #4: "Afterwards."

While the investment application form is standardized, there are limited guidelines on what emissions to include, and especially on how to calculate it: *"I really miss guidelines from the PlanetCo Group on how to do it. I have no idea. Is there any way we can estimate the total impact of CO2 based on some things? Or do we really have to ask an architect everywhere what my Scope 1 emissions will be..."* (Interviewee #22). Meanwhile, Interviewee #26 stressed that one line in the NPV calculation is not sufficient to make an impact and that more granularity is required: *"For the investment, I think that it's just putting one number there, for me it's not sufficient yet. We need to put more detail, to quantify, to educate the people a bit more to see that is also part of the impact because not everybody knows that we should go to this community but not everyone knows exactly what should be done, do this and do that and what could be the impact"*. This highlights how the preparers are committed to integrating sustainability, but the difficulties in calculating CO2 emissions with the tools currently at their disposal, combined with the possibility to use it opportunistically, facilitates the temporal and separation strategy to manage the corporate sustainability tension.

Intuition-based decision-making and subjective communication

As interviewees describes, the calculation of the Scope emissions is utilized in an opportunistic way and the management of the tensions is done through either a spatial or temporal separation strategy. In the choice of different spatial and temporal dimensions, a second determinant of tension management strategy becomes visible: intuition-based decision-making and subjective communication.

"In our case, we have a lot of freedom to invest where we believe we need to do something to bring reasonable or good payback. When it comes to sustainability and safety, honestly, we don't like to calculate too much. If you think it makes sense, we do." (Interviewee #24)

This quote illustrates how the approvers do not delve into the carbon cost line in the investment application, instead it is often considered merely as a "checking of a box". This viewpoint was also described by Interviewee #28 *"Sustainability is one parameter out of many which you have to consider. So I don't think there's any one parameter maybe except if there is no financial payback at all that would kill an investment"*. This was further emphasized by Interviewee #15 who stated that *"Personally, I think more in a sense of, okay, are we checking off the boxes? Are we fulfilling the requirements of the template...but I have to admit when we assess an investment, we primarily look at the profitability. So sustainability itself is kind of a bit underrated compared to the mere*

money itself”, emphasizing the subjectiveness. A similar mindset was also present with the CFO, who stated *“We will not approve of an investment that would go against the emission targets. Is it the most important? I would probably say no.”* (Interviewee #2).

All the interviewed approvers at PlanetCo consider and emphasize sustainability in the IIDM process of capital investments, but as shown, it is often not included due to the context or as a result of a temporal and spatial separation strategy, *“I cannot say systematically it is filled in [CO2 emissions], no. And when I ask, sometimes it's not, and they say, yeah, it's the same* (Interviewee #28). One preparer mentioned in relation to estimating carbon emissions, that in their projects *“it is needed, but it's A, not monitored. It's B, not asked. And C, it's not clear what to fill in.”* (Interviewee #22). Meanwhile, an approver in a different BA argues that: *“when the entities have to submit an investment form, it's absolutely part of the investment form. Absolutely mandatory.”* (Interviewee #27). This illustrates how personal opinion has an influence on how corporate sustainability is integrated and communicated in the IIDM process.

Moreover, in the case of Master Planet Project, where CO2 emissions were not included in the application, Interviewee #22 mentioned that other BAs don't include it, questioning the need to include it and make the payback period and NPV look worse: *“If the board is going to compare my investment versus another business area, I don't want to penalize myself....”* (Interviewee #22). Meaning that the uncertainty of practices in other BAs lead to differing degrees of inclusion and management strategies across BAs. The inclusion and quantification of carbon emissions is limited and used in an opportunistic way, but as stressed by the approvers, their decision-making is rather steered by the overall strategy and their intuition on whether an investment is sustainable or not: *“Yes there is a CO2 line as you know, but I don't think this is where the steering is done. You know, this is almost reactive rather than proactive. The real steering is done a lot earlier in the process (the strategy setting)”* (Interviewee #28).

Appropriation of including non-financial cost in a financial calculation

The third determinant of management strategy in the IIDM process for capital investments is referred to as the appropriation to include a non-financial cost in a financial calculation. Interviewee #2 explained that for capital investments they receive *“one with [carbon cost] and one without”* and that investments which are considered sustainable receive increased financial leeway through the acceptance of a longer payback period. The increased financial leeway is communicated throughout the organization, however what classifies as a sustainable investment or how much financial leeway is accepted is done on a case-by-case basis. Thus, sustainability is considered in the decision stage and has the potential to steer the IIDM process, even if a quantified carbon cost is not included in the financial calculation. Interviewee #17 stressed that as carbon emissions is a fictional cost, the appropriation to include it in the investment application form can be questioned:

Interviewer: “Should the carbon cost have a bigger impact [on the NPV calculations]?”

Interviewee #17: “Should it? You're making a business case, that is a financial calculation. So it may be if over time carbon certificates and carbon credits have a higher value, then that might have more impact. But a financial business case is a financial calculation, and you should stay with your financials. What decision you take based on that, that's something else. So you can say that if certain investments have a good impact on the environment, and you want to promote that, that you accept longer payback periods or lower NPVs, but at least you have the transparent numbers.”

This viewpoint, that integration of corporate sustainability into the financial calculations is neither necessary nor the optimal way to facilitate sustainability, was especially evident in Venus BA. Interviewee #17 went on, stating that *“we make separate calculations with and without carbon costs... And what we then do is we evaluate what is that extra cost, can we limit it and then it's what we get back for it worth it, so measuring it absolutely, but I don't think we should tweak Excel sheets until the sun says oh this is now a good project. I think your financials are your financials and then your ethical strategic decisions are another one”*. Still, Venus BA has made major sustainability improvements and is aiming to have net-zero Scope 1 and 2 emissions by 2030, one of the most ambitious sustainability targets in the group. The approvers at Venus BA accentuate sustainability and have sent investments back for rework due to a lack of sustainability inclusion: *“But it's not on the numbers. It's more on the concept that is presented”* (Interviewee #17). Rather, when incorporating sustainability in the IIDM process, Interviewee #17 explained that it is about: *“What do we want? Does it strategically fit? Does it help our customer? Those are the first questions. And then we check if the financials make sense. And they needed a new investment because capacity was going up. The proposal was gas. No, no. Electric will be more expensive, but then you review what else you can do, and then you go for electric.”*. This highlights that the limited integration of CO₂ emissions in the financial calculation does not unequivocally lead to financial benefits being prioritized over sustainability. Rather, the viewpoint that non-financial and financial costs should not be mixed, facilitates the observed spatial and temporal management strategies.

4.4. Internal Investment Decision-Making Process for Product Development

In succession to the IIDM process for capital investments and the exploration of the empirics and determining factors, this section will display the IIDM process of product development and its respective empirics and determining factors. The IIDM process for product development is inherently dynamic but can be described as a three-stage process. First is an ideation phase, second is a feasibility analysis which leads to a master specification plan and a resource allocation decision, and third is the execution. Along this process multiple stage-gates are implemented to track the development and determine whether the project should continue or not.

The ideation phase takes approximately one and a half years. In this time ideas are explored and suitable new projects are outlined. The general guideline, defining the way of exploration, is set in product strategy meetings that outline the upcoming fiscal years. For all new projects, sustainability targets are set. The calculus of how these goals is set differs between the business areas, for instance in Mars BA it depends on the project: *“we have three types of projects, where each type has its own emission reduction goal”* (Interviewee #23). However, common for all BAs is the baseline that no new product developments should worsen the environmental impact, consequently enforcing a guideline that steers the process.

After the ideation phase, the feasibility of the idea is tested, resulting in a master specification plan, which outlines the targets for the new product, including CO₂ targets. To measure CO₂ impact, PlanetCo has developed a carbon footprint calculator (PCF tool), that is used throughout all BAs. The PCF tool can be used to estimate both the embodied emissions, as well as the emissions throughout usage. An excerpt of the result page of the PCF tool is available in Figure 7.

With the help of the master specification plan that includes the financial estimations and calculations, and the PCF tool that quantifies the CO₂ impact of the proposed new development, a decision is made on whether the new project should be executed, and resources be allocated to it, or if it should be reworked or even declined.

Upon approval and resources being committed, the execution of the project commences. Once the product has been developed, it is checked against the sustainability targets which were agreed upon before the development started. Occasionally, product developments are canceled during the process as it becomes clear that the goals are unreachable, and the positive impact of the new products is too low.

Results			
Total Lifecycle Emissions		-	
Lifetime kgCO2e/unit		Power Use Profile	
Lifecycle Stage	Providing power for tool	Power use: Example	Weighted Average
Materials	2 684,8	2 684,8	2 684,8
Incoming Transport	43,2	43,2	43,2
Own Production	28,4	28,4	28,4
Outbound Transport	61,1	61,1	61,1
In-use Power	141 832,9	-	141 832,9
In-use Maintenance	1 457,2	1 457,2	1 457,2
	146 108	4 275	146 108
Note: End-of-life emissions have not been calculated, as they are immaterial for these types of products.			
%		Power Use Profile	
Lifecycle Stage	Providing power for tool	Power use: Example	Weighted Average
Materials	1,838%	62,808%	1,838%
Incoming Transport	0,030%	1,010%	0,030%
Own Production	0,019%	0,663%	0,019%
Outbound Transport	0,042%	1,430%	0,042%
In-use Power	97,074%	0,000%	97,074%
In-use Maintenance	0,997%	34,089%	0,997%
Lifecycle Emissions per Functional Unit		-	
gCO2e per -		Power Use Profile	
Lifecycle Stage	Providing power for tool	Power use: Example	Weighted Average
Materials	4,51228	207,54547	4,51228
Incoming Transport	0,07255	3,33694	0,07255
Own Production	0,04765	2,19156	0,04765
Outbound Transport	0,10275	4,72583	0,10275
In-use Power	238,37469	0,00000	238,37469
In-use Maintenance	2,44907	112,64652	2,44907
	245,55898	330,44632	245,55898
Note: results are shown in g not kg.			

Figure 7. The Result Page from the PCF Tool used for Product Development

In light of the theoretical framework, it becomes clear that the ideation phase combined with the feasibility analysis serve as the comprehension stage, as described in section 2.3. The engineers initiate a project and define a project they want to explore deeper and see potential future benefit in, thereby trying to manage a tension that either becomes visible in the process or drives the ideation itself. At the end of the comprehension stage, the master specification plan is created, with which the decision stage starts. The engineers present their idea with the help of the master specification plan, translating the technical knowledge into the language of business as the quantification of development costs, material and CO₂ impact guides the decision process. The decision stage then decides on the execution of the project and development of the new idea, thereby also deciding on an execution strategy. Thereafter, the management stage commences and executes the strategy and generates input for the contexts.

4.4.1. Sustainability Tension Management within the Product Development Process

To explore the sustainability tension management in the IIDM process for product development, two empirical projects were chosen: 1) *Project "Moon" in Jupiter BA* and

2) *Electrification Project in Mars BA*. Project Moon in Jupiter BA was selected as Jupiter BA represents the largest contributor to the group, both in terms of revenue, contributing approximately 45%, and Scope 3 emissions, generating approximately 80% of group Scope 3 emissions. The Electrification Project in Mars BA was selected as it displays a strategic shift that is driven by sustainability.

Table 3. Summary of the Two Product Development Projects

	<i>Project Moon</i>	<i>Electrification Project</i>
<i>Context Stage</i>	Jupiter BA's leading position in the market creates pressure for high performing products, increasing demand for efficiency improvements as this is the most important metric for customers.	The strategic context to embark on electrifying a product line, is directed by the commitment of SBTi targets. Furthermore, customers in the Product Market context ask for ease-of-use and geographically unrestricted usage.
<i>Tension</i>	Efficiency gains lead to lower Scope 3 per product but also to more sales, paradoxically leading to higher total Scope 3 emissions. Thereby, a tension forms in the environmental dimension itself and between the environmental and the economical one.	Electrification of products potentially diminishes revenue and paradoxically increasing scope 3 emissions due to unclean grid-electricity. Electrical products reliant on direct grid access, limit the geographical usage.
<i>Comprehension Stage</i>	Instead of focussing on Scope 3 emissions, a new measure of Scope 4, emissions avoided, was introduced to communicate the efforts.	Utilization of PCF tool to measure CO2 impact and to be able to communicate this to the decision stage.
<i>Decision Stage</i>	In the decision stage, the addition of the new element, Scope 4, made it possible to remain focused on energy efficiency while also accommodating customer demands.	Separating the PCF tool and the financial calculations, allows the decision-makers to follow the strategy and manage the paradoxical tension. The introduction of a third element, namely battery-driven products and battery-packs, accommodates both poles of the tension.
<i>Management Stage</i>	The realized strategy enables the management of the tension through the integration of an accommodating element, as well as the product being launched to the respective market.	The juxtaposed elements of electrification and financial prosperity were resolved through an adaptation of the product portfolio and a spatial separation strategy.
<i>Determining Factors</i>	The paradoxical tension necessitates PlanetCo to consider Scope 4 in their IIDM as Scope 3 does not capture the strategic directions and influences.	Conflicting targets as well as the strategic context necessitate electrification, however the tension makes it vital to introduce a new element in the form of an adapted product mix.

4.4.2. Project “Moon” in Jupiter BA

The first product development project regards efficiency improvements through Project “Moon” in Jupiter BA. Jupiter BA has products that are seen as world leading in their respective domain: *“Our products are generally more efficient than our competitors, because of the sheer market share we have, we are the absolute market leader in the world.”* (Interviewee #9). This provides Jupiter BA a pole position in the market and therefore high revenue streams. To maintain this position and have the leading products, Jupiter BA and its divisions continuously embark on journeys to improve their products, as in this case with product Moon.

Given Jupiter BA's dominant position in the sector, the product and market context place a significant emphasis on the overall product performance. It is imperative for their products to remain the best in the market for consideration, especially as competitors strive to enhance their offerings, creating pressure on both PlanetCo and particularly Jupiter BA to maintain their high-performance standards. In terms of sustainability, clients not only seek superior product performance but also demand energy-efficient products, indicating a preference for environmental sustainability. Within the capital market context, the projected revenues are of paramount financial importance, and

simultaneous compliance with communicated sustainability goals is essential. This underscores the necessity for PlanetCo to initiate efficiency improvement projects. In the structural and strategic dimension, expectations for product developments are contributions to the product's efficiency, ultimately leading to increased revenue and a larger market share. Additionally, as energy efficiency and Scope 3 emissions are inextricably linked, the expectation is formed that Scope 3 emissions should decrease with product developments. This was highlighted by the CFO: *"When you talk to a customer about reducing energy, then you also talk about reducing cost. And by coincidence, it also means automatically that it means reducing your CO2 footprint in the world, which is of course a very nice collateral effect"* (Interviewee #2).

The paradoxical tension lies in the fact that while enhanced energy efficiency contributes to lower Scope 3 emissions on a per product basis, it also results in increased sales as energy efficiency is the most important customer value proposition, paradoxically leading to higher Scope 3 emissions overall. *"We grow double digits and so we pain ourselves or we hurt ourselves in this Scope 3, because we do improve with maybe 2% per year or 3% per year. But yeah, if you grow 13%, you're kind of offsetting"* (Interviewee #18). This occurs even though the emissions per individual product are reduced. The intricacies between energy efficiency gains leading to an increase in total Scope 3 emissions, enhances the obligation paradox between maximizing customer benefits and PlanetCo's ambition to comply with the SBTi targets.

In assessing the IIDM process, it becomes evident that in the comprehension stage the sustainability of the new product in Project Moon and the outlook for Scope 3 emissions were considered due to the requirements of the investment process. However, the PCF tool was not used in this stage to measure Scope 3 emissions, rather it was used retroactively to the project due to reporting requirements: *"It's a pity I need to admit this, but it's a retroactive calculation as a KPI, we need to do the calculation for reporting"* (Interviewee #13). Moreover, in the goal setting for Project Moon, the sole focus was on efficiency improvements and therefore emissions avoided, not on Scope 3. This was done as it was evident that a performance increase will result in higher total Scope 3 emissions due to the increased sales. Accordingly, the salience of the tensions was acknowledged:

"And they [Scope 3 emissions] are going up because we as a company are producing more and more. A better idea would be to measure footprint vs revenues. Because when we're seeing revenue increase, we're seeing footprint increase. If we compare our footprint increase to the revenue increase, we see that the revenue increase is higher than the footprint. So, per euro of product that we sell now, we have a lower footprint. So that's our indication we're going in the right direction. But we really are struggling with the fact that we also need a way to report a relative emission." (Interviewee #14)

After the feasibility of Project Moon was proven and the master specification plan was finalized, the approval phase commenced, strongly focusing on the impact for the customers and their value from the product. This was highlighted by Interviewee #15: *"We are customer focused., [...], We will do the project, because for the customer, efficiency is key."*, underscoring the fact that the focus for product development lies in

efficiency gains as it is the metric the customer is mostly concerned about. This fact was further elaborated on by Interviewee #16 in regard to the necessary calculations for an investment decision: *“It's efficiency. The way we calculate today is efficiency. Which is important anyway. And that's a dedicated KPI on itself, efficiency improvements”*.

To demonstrate and still capture the effect of the paradoxical tension PlanetCo has introduced a new accounting element, Scope 4 emissions, which is a measure for the emissions avoided by a product or investment. This is done by comparing the emissions from old products with the new developments, meaning estimating the emissions avoided from a new product. Scope 4 is not used in external reporting; however, it is applied in the product development process.

Interviewer: “How are you decoupling organic growth with CO2 emissions?”

Interviewee #14: “Actually by thinking of Scope 4. Because within Scope 3 if you grow 25% per year or if you grow 15% per year like for example our division is doing, yeah, it's kind of absurd. It's kind of absurd because you can never make a mechanical system every time or every year 25% more efficient, not even 5%.”

Through the utilization and focus on a new element, Scope 4 emissions, PlanetCo has found an alternative for themselves to manage the tension between financial growth and total Scope 3 emissions. The Scope 4 emissions serve as essential input to the decision phase, allowing PlanetCo to make a thorough decision, while not enforcing Scope 3 goals which are in conflict with the financial targets. Furthermore, the Scope 4 emissions become crucial input to the customer and market context as they are communicated to emphasize the efficiency and sustainability gains.

4.4.3. Electrification Project in Mars BA

The second project within product development surrounds the electrification of a product line in Mars BA. Mars BA has a strong incentive to reduce their emissions, as the BA is the key contributors to the group's Scope 3 emissions, while the group's commitment to SBTi are increasing the pressure on the reduction of the Scope 3 emissions by 2030.

The strategic direction for the product line was elaborated on by Interviewee #23: *“It is initiated in Sweden, they set these science-based targets. It's in the personal targets for every manager. So, it's going top down, and that's helping of course. Because if it was not in their targets, then nothing will happen. But now it's in their targets, so they need to succeed”*. This was also stressed by Interviewee #28: *“We need to grow; we need to pay back to the shareholders. And it's not like tomorrow we should stop all the diesel products, we should only sell battery driven. It's not that extreme. So, I think it's a process that will take time and patience. And the balancing between different goals. But keeping in mind what is the general direction to go. And the general direction is clear”*.

As indicated by Interviewee #28, most of Mars BA's products are fossil fuel driven, meaning they are not connected to the electrical grid as many of the other BA's products are. A key reason for this is that their products offer geographically unrestricted usability, as customers use the products in rural as well as urban areas. Thus, if Mars BA decides to completely redesign their product mix towards electricity, it would threaten their revenue outlook. Furthermore, electrification is not a certainty to reduce their CO2 impact, as the electrical grid of some countries is fueled by fossil fuels, leading to electrical products having a worse environmental impact than the use of diesel or petrol, consequently increasing Mars BA's Scope 3 emissions: *"When it concerns electricity factors, they are different per country. So, you need to know, will it be in Germany or will it be in Belgium. In Germany it's very bad electricity. In Germany you are proposed to use a diesel machine. [...] So if you buy electric, your machine is fit for the future, but produces more emissions at the moment"* (Interviewee #7).

Thus, a salient paradoxical innovation tension arises, wherein the strive for electrification, driven by their strategic commitment to comply with SBTi potentially diminishes their revenue and paradoxically could result in increased Scope 3 emissions. The paradoxicality of the tensions is further elaborated on by Interviewee #23: *"The drawback of that is that an electronic engine is more expensive when you buy it, but over the total year, the cost of ownership will go down because it consumes less energy. But then we have to convince the customer that it's true. The other thing is that they cannot service the engine themselves anymore. With a mechanical engine you do it yourself, but an electronic engine, you have to go to a garage. So, it's difficult. So, we will sell the electronic engines, but for sure we will lose some market share"*.

In the preparation stage of the new investment and product development of electrified products, next to the master specification plan, the PCF tool was tentatively used to measure key metrics: *"Fill in materials used in your machine, the weights, and you have to fill in the service hours you will do, and you have to fill in all the contributors of Scope 3. And then also the load profile, how will your machine be used, and how much does it consume, and then it calculates carbon footprint"* (Interviewee #23). To account for the different geographical factors affecting the Scope 3 emissions, the PCF tool includes a regional factor: *"And there is, inside the calculation tool, there is one spreadsheet which holds the emission factor by country. And then R&D is asking marketing, okay, where do you foresee the majority of the sales? It's going to be 50% in the US, 50% in Germany, or 50% in France, or whatever. And this will have, then, an impact on the estimated CO2 impact"* (Interviewee #30). The PCF tool allows for the measurement, as well as communication of the changes in potential Scope 3 emissions a product development will have depending on the intended market. Furthermore, a recent update for the PCF tool was that *"you now can compare two machines and also when you now fill in two machines, there is a result page which shows with graphs what the difference is in the carbon footprint. So, before you had to make one calculation, the other calculation and then make a graph yourself and or find a way to show it and everybody did it in a different*

way” (Interviewee #23). The PCF tool, as a separate calculation on the environmental impact, allows for the measurement of CO2 emissions without integrating it to the financial calculations, subsequently providing input to the decision phase.

While the PCF tool was used to measure the CO2 emission improvements for the Electrification Project, it does not manage the tension between financial and sustainability benefits. Instead, in the decision stage, this was managed through the addition of a new element: *“We have products that are, now since a year or two electric, but they're plug-ins still. But for a contractor who uses our products he wants to just put it on his truck and drive to the other side of the construction site and start continuing there and now he needs to make sure that he has a cable of 100 meters. But now we've introduced battery driven products and battery packs”* (Interviewee #16). In the decision stage, the management of the tensions came in the form of another product development process, namely battery-driven products, and battery packs. Storage of electricity will allow for the electrification of products and improvement of Scope 3 emissions in the long run, while also maintaining and potentially enhancing performance, as the electrically powered machines produce less noise pollution.

The change and adaptation of the product portfolio was also discussed by Interviewee #23: *“I'm looking at the portfolio that we put together. So, they are making more and more electric machines. In Spain, another product company, they are already looking at combining a product with a battery pack. So, the peak loads can be taken by the battery pack, and you can size your product smaller. So, these are the things we are working on. We make sure that we change our product portfolio and make it as energy efficient as possible”*. The IIDM process thus manages the tension through a paradoxical resolution strategy, as it introduces a new element and adapts the strategy, as the possibility still persists to sell fossil fuel-based machines where necessary, while enabling the purchase of electricity and battery-based products. Moreover, the outcome of the IIDM process and tension management in the Electrification Project influences and changes the strategic context through the introduction of a new product mix. This is also communicated to the adjacent contexts and provides input for a change of expectations.

The ambidexterity of the decision-makers, electrification due to sustainability reasons on the one hand and financial prosperity on the other, was facilitated through the utilization of the PCF tool. However, the tension wasn't managed by the PCF tool, rather the measurements paved the way for the decision stage to manage the tension. The decision involved examining how electrification necessitates a reconfiguration of the product mix, leading to the allocation of resources to integrate a new product mix that manages the tensions. Furthermore, the paradoxical tension that electrification will lead to short term increase of Scope 3 due to dirty electricity, was acknowledged and managed through an acceptance strategy.

4.4.4. Determining Factors for Tension Management in the Product Development Process

In the realm of product development, the IIDM process adopts a certain approach to manage corporate sustainability tensions. In the context of Project Moon, the tension between the efficiency improvements per product paradoxically resulting in higher total Scope 3 emissions was acknowledged. To manage this, a new accounting element, Scope 4, was introduced and focused on throughout the product development process. The IIDM process thereby enabled quantified decision-making and accommodated both poles of the tension. The Electrification Project posed a threat to the economic outlook and market position as a result of limited geographical usage, while also paradoxically increasing their Scope 3 emissions short term due to dirty electricity. The IIDM process manages the tension by adapting the overall product mix, introducing a new element that accommodated both poles. Followingly, the two most noticeable determining factors of the management strategy choice will be explored.

Adaptability of Accounting

The two projects exemplify the first observed determinant of management of paradoxical corporate sustainability tensions, namely the misrepresentation of PlanetCo's reality in their respective accounting measures, in combination with their current conflicting strategic targets. This was highlighted in Project Moon, where efficiency improvements lead to lower Scope 3 emissions per product, but paradoxically a raise to the total reported Scope 3 emissions due to an increase in sales. This forms a contraposition to PlanetCo's SBTi targets, as well as the incentive targets for managers. This was explained by Interviewee #18: *"So if we deliver a product and you put 200 kilowatts in, then the outcome is having, let's say, 10 kilowatts of intrinsic potential energy, but 190 kilowatt is heat. It's an unfortunate situation, but it is what it is. But if you can use this 190 kilowatt for heat recovery, you can use that to generate electricity again or to generate steam again or to generate just lower quality heat, then you have a significant, huge Scope 4, which is relevant, it's not, let's say, cheating or playing tricks, no, it is really for that customer, he doesn't have to buy a steam generator, no, he just uses our heat to generate steam"*. The dissatisfaction with the current carbon accounting measures was elaborated on by Interviewee #28 *"I would love to [report on Scope 4], I mean, all the stuff which we have until now is, you know, it makes us look terrible. And what? You think that for me as a PlanetCo employee, you think I feel terrible. No, I don't. I feel very proud of my company. Why? Because we develop products which are more energy efficient than anyone else in the world"*.

By introducing and focusing on Scope 4, PlanetCo is able to focus on both their financial targets and their sustainability ambitions through efficiency improvements. Simultaneously, this offers an explanation to the retroactive use and limited steering capability of the PCF tool in the preparation stage and throughout the efficiency project. As shown, all product developments have sustainability targets and the ambition to

become more energy efficient throughout the process. However, the PCF tool offers limited steering capabilities, as the representation of Scope 3 does not lead to improved sustainability or financial performance, rather it is the emissions avoided that is the most important steering metric (Scope 4). Another explanatory factor for focusing on Scope 4 is that PlanetCo's Scope 3 target is heavily reliant on the electric grid: *"And that's actually part of our Scope 3 journey, that we assume a certain grid transition over time until 2030 to actually achieve. If the grid transition doesn't go as fast as we anticipated, then we will not reach our target. That's a given"* (Interviewee #2). By introducing a new element and adapting the accounting, PlanetCo is able to accommodate both poles of the corporate sustainability tension. While contextual requirements pressure PlanetCo's product development in certain directions, it's only when the corporate sustainability tensions are managed that the outcome attends to all dimensions of sustainability. By using the PCF tool as a measurement tool rather than steering tool and by introducing a Scope 4 mindset, the paradoxical tension is managed through a paradoxical resolution strategy of accommodation.

Strategy Guides Product Development

In the projects, it is further noticeable that a main determining factor of product development is the strategy and its implications. As described by Interviewee #29: *"Sustainability is one of the additional constraints that they will have to face. And again, the priority for R&D is to deliver a product which will create value for the customer. So sustainability is one of the benefits we can offer, but it can never be the only one. [...] So you see what I mean? On the one hand this product would have less emissions, on the other hand none of the customers would buy a product with 17 batteries."* As highlighted, environmental sustainability is part of the strategy but not necessarily the main determining factor, as the customer value and their interests drive the product development. Interviewee #6 describes: *"We live by profit. We need to sell machines and the more machines we sell, the better our stocks perform, the happier shareholders are. But this is, it will, it's very often one-on-one conflicting with what you want to, where you want to get to as a real climate advocate or activist"*. Underlining the conflict between PlanetCo's ambition to perform well financially and create shareholder value, but also extend their positive environmental impact.

To cope with this mixture of goals, PlanetCo has integrated sustainability targets into the goal setting of their managers, incentivizing them to explore the possibilities and customer demands: *"This awareness around the topic, the fact that it's put in people's targets, that company group goals are very much reflecting that new topic of sustainability, that means that a lot more people in a lot more places in the group will have to fight for CO2, fight for investments that, and look for investments that have positive impact. There are targets for Scope 1, 2 and 3, so we do push people to come with suggestions and to come with investments to that target."* (Interviewee #6).

In summary, it is the strategy that drives the product development of which sustainability is part, but not necessarily the driving factor, as explained by Interviewee #8: *“I would say most of the steering in PlanetCo or a lot of the steering especially in finance is done through the KPIs that we have a lot of different KPIs but of course some of them are sustainability KPIs. And then depending on how we measure the entities, it should also then drive them in a direction which is desirable”*.

4.5. Summary of Empirical findings

In the empirical section, the two diverse IIDM processes of capital investments and product developments were explored. For this, the processes were described and their alignment with the theoretical framework from section 2.3 displayed, followed by two examples for each process. The empirics show that the capital investment IIDM process applies a temporal and spatial separation strategy to manage the sustainability tensions present. This is attributable to the three reasons explored, the intricacies of quantifying CO2 emissions, the influence of intuition-based decision-making and subjective communication as well as the appropriation of including non-financial cost in a financial calculation. In the IIDM process for product development, PlanetCo chooses to acknowledge the tensions and embark on a paradoxical resolution strategy through the establishment of an accommodating instrument that changes the used accounting, Scope 4. The second accommodation displayed is the change in the product portfolio in order to strive with both strategic poles present. The determining factors for the choice of management strategy in product developments were explored, namely, accounting and conflicting targets, and the fact that the strategy guides the product development.

5. Discussion

In this section, the empirical findings are linked to the theory presented in section 2. Differences in management of corporate sustainability tensions in the two different processes of IIDM are discussed and conceptualized.

Strategic and contextual influence

The first acknowledged influence factor is the strategy and compliance with the context's expectations, as put forward in the empirics. PlanetCo's SBTi-compliant environmental goals strongly influence the IIDM, as it provides the frame for investments. This is in line with the findings of Bower & Gilbert (2005), who stated that resource allocation is influenced by their adjacent contexts and the evaluation of strategic focus. As seen in the empirics of capital investments and in product development, the strategy drives the investments, e.g. the decision to electrify the product line was driven by the strategy and internal goals in the product development process, while both capital investment projects were the results of the decision to strive for higher operational results (Vesty & Oliver, 2014). As such, while the allocation of resources shapes the realized strategy (Bower & Gilbert, 2005), the findings highlight that the strategy also shapes the IIDM process. Furthermore, in line with the argument of Miller & O'Leary (2007), the SBTi compliance and strategy form a mediating instrument that guides the investments to fulfill the overall objectives, while still needing the direct evaluation through the IIDM process. As seen in the case of geo-thermal heating, the investment opportunity is aligned with the strategic frame, but the evaluation decided it to be overall unsuited due to their respective costs and the proportional insufficient upside. Evidently, the IIDM process represents the evaluation of the strategy fulfillment of the investment opportunities (Sureka et al., 2022).

Adaptation of accounting

A second important facilitator of change and choice of tension management strategy is the applied accounting and representation. The commitment to SBTi and appliance of these targets throughout PlanetCo, emphasizes the tensions between efficiency improvements leading to an increase in total Scope 3 emissions as a result of sales growth, in line with the paradoxical obligation tension discussed by Smith et al. (2016). Either PlanetCo favors the shareholders by lowering their total Scope 3 emissions, or PlanetCo favors the global society by focusing on the emissions avoided (Scope 4). In line with the paradox perspective, organizations must pursue conflicting targets simultaneously and be comfortable with inconsistencies, although it can raise the intensity of the tension (Lüscher & Lewis 2008; Hahn et al., 2015; Smith et al., 2016). PlanetCo complies with this strategy in the empirical setting, as it strives for an improvement of both poles, through the introduction of Scope 4 as a new accounting element in product development (Smith & Lewis, 2011; Hahn et al., 2015). Frost & Rooney (2021) argue that understanding that accounting is flawed is vital to be able to integrate sustainability in

capital budgeting and IIDM, meanwhile Mouritsen & Hald (2018) emphasize that accounting is fluid and can be adapted to better “re-present” reality, as in the case of Scope 4 for PlanetCo. Scope 4 is not an acknowledged external reporting sustainability measure; however, it better represents PlanetCo’s possible sustainability impact, namely energy efficiency improvements and electrification of their products. The strategy to focus on Scope 4 emissions is aligned with the synthetization strategy described by Hahn et al. (2015). In the IIDM process targets for efficiency are set, but not for Scope 3 emissions, as these emissions are in conflict with the financial goals of the company, thereby the IIDM process facilitates the discussions around Scope 4.

In line with He et al. (2020), the carbon accounting at PlanetCo was adapted to steer the decision-making towards greener investments and simultaneously manage the obligation tension (Smith et al., 2016). For capital investments, the accounting was not flawed to the same extent, as Scope 1 and 2 are able to capture and represent the reality (Mouritsen & Hald, 2018). Rather, it was the measurement difficulties that necessitated a spatial and temporal separation strategy to manage the corporate sustainability tensions (Smith & Lewis, 2011; Hahn et al., 2015). The adaptation and change of accounting measurements facilitate corporate sustainability improvements at PlanetCo, extending the findings by Mouritsen & Hald (2018) that accounting is the precursor to change and innovation and as such, also the precursor to sustainability integration.

Calculations and Tools

In the capital budgeting literature there remains a discussion on the optimal approach to integrate corporate sustainability (Vesty & Oliver, 2014; Martin, 2021; Frost & Rooney, 2021). While there is no consensus on the appropriateness to mix non-financial and financial costs, it has been found that integrating sustainability in the financial calculations can influence the IIDM towards more sustainable investments (Kimbrow, 2013; Mikes & Metzner, 2023). In the capital investments process, preparers at PlanetCo can opportunistically use the carbon cost line, which Kimbro (2013) refers to as the sustainability cost NPV. Meanwhile, corporate sustainability is not integrated as a risk factor in the cost of capital calculation (Kimbrow, 2013). In the product development IIDM process sustainability targets are set, but the environmental impact is not integrated with the financial calculations. While the increased emphasis on corporate sustainability forms the IIDM process through the contexts, the tools available for preparers and approvers must adapt as well to avoid the intentional and unintentional ignorance of the sustainability considerations in the accounting models (Vesty & Oliver, 2014). MCSs, such as the NPV calculation in the IIDM process for capital investments at PlanetCo, have the ability to integrate sustainability and enable strategic change (Gond et al., 2012; Beusch et al., 2022; Mikes & Metzner, 2023). However, in order to allow for an adequate implementation, incremental changes in MCS practices are necessary (Beusch et al., 2022). At PlanetCo, this was evident through the continuous development of the PCF tool in product development, enabling the process to adapt to the changes. In contrast, in the

context of IIDM for capital investments, the difficulties of quantifying CO2 emissions combined with limited guidance limits the integration of corporate sustainability and showcased a lack of adaptability to facilitate improvements. In light of the theory, it becomes evident that a paradoxical resolution strategy of spatial and temporal differentiation leads to short-term results but that incremental changes in the MCS is necessary for long-term success (Gond, 2012; Beusch et al., 2022). This was evident in the empirics where organizational members asked for a more comprehensible and extensive CO2 integration in the investment application form.

Guidance and opportunistic behavior

Vesty & Oliver (2014) argue that a lack of guidance on the incorporation of sustainability leads to disadvantageous decisions, where individuals can impose their own measurements and judgment criteria. This was evident in the case of PlanetCo's capital investment undertakings, as the lack of guidance results in varying usage of the carbon calculations, leading to separation strategies (Hahn et al., 2015). Reasoning for this being the difficulty to measure CO2 impact in the preparation stage, combined with the approvers not requesting any concrete CO2 figures. Thus, highlighting the maintained focus on NPV and payback period calculations to evaluate investments (Brunzell et al., 2011; Sureka et al., 2022) and the fact that sustainability considerations are rather an input to the strategic guidance than the direct decision on capital allocation (Vesty & Oliver, 2014). Furthermore, the empirics highlight the influence of personal opinion in IIDM (Vesty & Oliver, 2014), as the decisions are influenced by the expertise and intuitive judgment of the respective persons involved (Grant & Nilsson, 2020). This is evident in the observed setting, where preparers and approvers base their decisions on the context, ensuring that the capital investments and product developments contribute to the strategic direction and thereby their environmental commitments. Highlighting the importance for the incorporation of non-financial knowledge, like the presentation that always has to be prepared for capital investments, allowing for approvers expertise to steer decision-making (Grant & Nilsson, 2020; Frost & Rooney 2021). This also strengthens the argument of Martin (2021), that personal opinion has a strong influence on the decision-making. Thus, the empirical findings support Mikes & Metzner (2023) findings that firms can integrate sustainability in their MCSs and the IIDM process.

In the case of the Master Planet Project and at Venus BA, the appropriateness of CO2 emissions integration in a financial calculation was questioned, which provides an explanation for the management strategy to separate the corporate sustainability tensions spatially and temporally (Smith & Lewis, 2011; Hahn et al., 2015). Although process formalization has a positive influence on the efficiency of allocation decisions (Strauch et al., 2019), in the case of PlanetCo, the formalization of the quantitative integration of the environmental impact seems to lead to a prolongation of the process. In the capital investment projects, environmental sustainability considerations were not postponed due a lack of strategic importance and commitment, rather due to the difficulties in measuring

the impact. For example, in the case of the China Relocation Project, a dedicated team was formed to enable in-depth cross functional discussions to make the dedicated investments as sustainable as possible. Still, by spatially and temporally separating sustainability from the investment calculations, companies run into the risk of personal opinion, heuristics, and other biases, diminishing sustainability, and instead prioritizing the business case (Harris, 1999; Haka, 2007; Vesty & Oliver, 2014; Hahn et al., 2018; Grant & Nilsson, 2020; Martin, 2021). This was evident in the proposed geothermal heating solution, where promised sustainability benefits were significant but required a significant monetary investment. In the words of Smith et al. (2016), this tension can be classified as an innovation paradox, a tension between investing for today or tomorrow. In this case, the tension was not managed, and the personal opinion of the decision-maker was that there will be better and more cost-efficient solutions in the future, leading to the prioritization of the status quo. In line with previous research stating that personal biases can influence the IIDM process (Martin, 2021).

Concluding differences

While capital investments consider Scope 1 & 2 emissions, the product development process strongly considers the Scope 3 emissions. Therefore, the objective of sustainability considerations in the IIDM processes and the implementation and timing of the considerations differ. As argued by Strauch et al. (2019), the configuration of the investment process leads to a varying efficiency of the allocation. This holds true for the capital investment process at PlanetCo, as the decision process demands sustainability considerations, but due to calculation complexity, temporal and spatial dimensions are assigned to have an outcome that manages the tension, in line with a paradoxical resolution strategy through separation (Smith & Lewis, 2011; Hahn et al., 2015). Noticeably, as in the argumentation of Strauch et al. (2019), the influence of the process formalization seems to lead to diverging tension management strategies in the context of Smith & Lewis (2011). The process of capital investment is rather rigid with a fixed integration of sustainability prior to the investment, compared to the dynamic process of product development. In the context of PlanetCo, this led to diverging approaches on managing the tensions. While the capital investment process seems to manage the tensions through a temporal and spatial separation as in the case of the China Relocation and the Master Planet Project, the product development investment processes seem to rather acknowledge the tensions enabling virtuous cycles and finding accommodating instruments (Smith & Lewis, 2011; Hahn et al., 2015) or changing the accounting scheme (Mouritsen & Hald, 2018).

6. Conclusion

The purpose of the thesis was to analyze how the IIDM process is affected by the integration of corporate sustainability and how possible tensions are managed. Thereby, contributing to the three research areas described in the theory section, namely 1) Internal Investment Decision-Making processes, 2) Corporate sustainability development and challenges, and 3) Integration of corporate sustainability in IIDM process. While there exists research on corporate sustainability tension management and the IIDM process respectively, there is limited research on how corporate sustainability tensions are managed through the IIDM process. With more and more companies committing to SBTi and stakeholders requiring companies to decrease carbon emissions, this thesis aimed to fill this research gap and provide valuable academic and practical insights.

The research was conducted through a single case study of a multinational industrial company by carrying out 30 semi-structured interviews with organizational members on different hierarchical levels. By applying a paradoxical perspective and the creation of an integrated framework, this thesis aimed to answer the research question:

How is the Internal Investment Decision-Making (IIDM) process affected by the integration of corporate sustainability and how are possible tensions managed?

The empirical findings showcase that the two different IIDM processes of capital investments and product development favor differing sustainability tension management strategies. While the capital investment process emphasizes Scope 1 & 2 emissions in the process and calculations, to manage their obligation paradoxical tensions, strategies of temporal and spatial separation are favored due to a lack of guidance and quantification difficulties. The stringency of the process limits sustainability integration, thereby enabling opportunistic behavior and an inability of the accounting systems to be adapted to facilitate the integration. However, the strategic context combined with the spatial and temporal separation strategy manages the tensions and enables both economic and environmental benefits to be pursued.

With regard to product development, the IIDM process must manage the paradoxical obligation tension between increased efficiency improvements leading to lower Scope 3 emissions per product, simultaneously leading to higher Scope 3 emissions in total as a result of the sales growth. Furthermore, the paradoxical innovation tension between electrification leading to lower revenue and Scope 3 emissions not improving due to bad electricity had to be managed. The IIDM process of product development manages these tensions by introducing a new element that accommodates both poles of the tension. In the case of the first tension this was done by introducing a new accounting element, namely Scope 4 emissions. While in the Electrification Project, this was managed by allocating resources to the new project of battery driven products and battery-packs. Through adapting the accounting to better represent reality and introducing new elements

to the product portfolio, the IIDM process manages the conflicting targets and paradoxical tensions. As evident in the capital investment process as well, the contexts are of utmost importance in the steering of the IIDM processes as well as its management of corporate sustainability tensions. In summary, in the capital investments process, tension management through temporal and spatial separation were favored, while in product development new accommodating elements were introduced.

Moreover, while the IIDM process manages sustainability tensions through paradoxical resolution strategies, sustainability considerations also shape IIDM. In the empirics, the accounting scheme for product development was adapted due to the misrepresentation of PlanetCo's sustainability efforts. Thus, highlighting the role of sustainability considerations in influencing the applied accounting measures.

In addition to theoretical insights, the empirical findings bear practical insights as they highlight how corporate sustainability tensions in IIDM can be managed. It becomes apparent that IIDM needs to be a purposely driven process that allows for adaptation of the accounting and evaluation factors in order for organizations to integrate sustainability and not favor the economic benefits in investment decisions. Furthermore, the findings highlight that a lack of CO₂ quantification does not automatically lead to the business case being favored, as long as the context and strategy influence the IIDM process.

The findings of the thesis are subject to certain limitations. One example is that the interviews were made possible by a contact person at the case company, consequently leading to a potential selection bias on who was interviewed. However, this can also be considered a strength, since people that were not particularly interested in the sustainability topic were still interviewed thanks to the internal push from the contact person. Another possible limitation of this study is the bias from the researchers. By reading literature on how corporate sustainability is integrated in organizational processes, this could have shaped the researchers' questions and consequently the responses from the interviewees. Furthermore, while no concrete questions were sent to the interviewees, they were informed of the aim of the thesis and as such, could have adopted their responses, accordingly, affecting the data collection and data analysis.

Future research could investigate how the IIDM process can be changed to better manage corporate sustainability tensions. This thesis showed how the capital investment and product development processes currently manage the corporate sustainability tensions in different ways, but no recommendation on the most optimal way to do it was made, as this is outside the scope of the thesis. This would yield practical insights on how to maximize stakeholder value. Moreover, future research could use the applied theoretical framework to contrast and compare IIDM processes with different organizations. For instance, researchers could compare this thesis findings with a centralized organization and analyze how the degree of centralization affects the integration of sustainability in IIDM processes and possible tension management strategies. Furthermore, future research could investigate whether the choice of temporal separation leads to optimized

sustainability performance. As this thesis has focused on the environmental and economical part of sustainability, another possibility would be to see how the integration of social dimensions affects IIDM. During the interviews it was indicated that social costs are even more difficult to quantify, but even more important than environmental costs. It would therefore be of interest to research, why economic and environmental benefits must be quantified in the IIDM process, but social benefits do not. Lastly, by 1st of January 2024 CSRD will be implemented in Europe, creating more extensive sustainability reporting requirements. Future research could investigate how the implementation of CSRD affects the IIDM process. During the study it was evident that CSRD will lead to a major change to the IIDM process, possibly enhancing corporate sustainability tensions, but the outcome is still unclear as this thesis is written before the implementation.

7. References

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8. Appendix

Appendix A: List of Conducted Interviews

<i>Interviewee</i>	<i>Position</i>	<i>Date</i>	<i>Duration</i>	<i>Conducted</i>
#1	General Manager Jupiter BA	2023-10-06	70 minutes	Online
#2	Chief Financial Officer	2023-10-06	61 minutes	In person
#3	Group Sustainability Controller	2023-10-06	57 minutes	In person
#4	Business Controller Jupiter BA	2023-10-09	56 minutes	Online
#5	VP Group Sustainability Controller	2023-10-10	35 minutes	In person
#6	General Manager Asia Jupiter BA	2023-10-11	57 minutes	Online
#7	VP Business area controller Saturn BA	2023-10-11	46 minutes	In person
#8	VP Sustainability Controller Jupiter BA	2023-10-16	75 minutes	In person
#9	Sustainability Engineer Jupiter BA	2023-10-17	61 minutes	In person
#10	VP New Business Technology Jupiter BA	2023-10-17	58 minutes	In person
#11	Business Controller Venus BA	2023-10-17	35 minutes	In person
#12	Logistics Engineer Venus BA	2023-10-17	35 minutes	In person
#13	Project Expert Jupiter BA	2023-10-17	35 minutes	In person
#14	Sustainability Engineer Jupiter BA	2023-10-17	30 minutes	In person
#15	Product Company Controller Saturn BA	2023-10-18	54 minutes	Online
#16	Business Analyst Mars BA	2023-10-18	58 minutes	In person
#17	Vice President Operations Saturn BA	2023-10-18	59 minutes	Online
#18	VP Engineering Jupiter BA	2023-10-18	30 minutes	Online
#19	Divisional Controller Saturn BA	2023-10-18	54 minutes	Online
#20	VP Global Operations Jupiter BA	2023-10-19	72 minutes	In person
#21	Sustainability Manager Mars BA	2023-10-19	60 minutes	In person
#22	VP Business Control Jupiter BA	2023-10-19	61 minutes	In person
#23	Sustainability Manager Mars BA	2023-10-19	72 minutes	In person
#24	VP Business Control Jupiter BA	2023-10-20	55 minutes	In person
#25	Sustainability Engineer Venus BA	2023-10-20	50 minutes	In person
#26	Divisional Controller Jupiter BA	2023-10-23	61 minutes	Online
#27	Divisional Controller Saturn BA	2023-10-25	58 minutes	Online
#28	VP Controller Mars BA	2023-10-26	50 minutes	Online
#29	Divisional Controller Mars BA	2023-10-26	60 minutes	Online
#30	Sustainability Manager Venus BA	2023-10-30	40 minutes	Online

Average duration: 54 minutes, **Total interviewees:** 30, **Conducted in person:** 18, **Conducted online:** 12

Appendix B: General Interview Guide

The following themes and exemplary questions were used to guide the semi-structured interviews. The interview guide was adjusted for each individual interviewee.

<i>Theme</i>	<i>Exemplary Questions</i>	<i>Interest</i>
Role & Responsibilities	- Please describe your role and your background both within and outside the company - What are your key responsibilities?	To loosen up the interviewee, get to know them and their knowledge, as well as their current responsibilities
Preparer-specific	- What was a recent capital investment project you were involved in? - What was the motivation behind this project? - What was your role in this process? - How was sustainability integrated in the capital investment process? - When in time was sustainability considered? Why was it done that way? - What degree of influence does sustainability have on the investment? - How is the communication of qualitative sustainability done? - How is sustainability considered prior to the capital budgeting process? - What other factors were crucial in preparing these documents? - Where do you see, the process and the documents can be adjusted to capture sustainability in a better way?	To get an understanding of the preparation stage in the IIDM process and how sustainability is integrated in the process
Approver-specific	- Could you please tell us about a recent capital investment you approved? - How was sustainability integrated in the capital investment process? - What factors are most crucial for you in these documents? - What discussions do you have with preparers and is sustainability discussed? - Are there specific tensions in regards to sustainability in the process? - To what degree does the inclusion of the carbon price influence your decision? - In which other ways is sustainability considered? And how do these influence the decisions and discussions? - Have you recently rejected a project due to sustainability? Why was that? - Does the degree of sustainability provide a degree of financial leeway?	To get an understanding of how sustainability is integrated in decision-making
Capital Investments	- What has been a recent investment project you've been involved in? - How did the capital budgeting process work for a recent project? - What was the context in which the investment was made? - What external factors influenced the project and the decision? - What are the feedback loops mainly about? - How and when was sustainability considered in this process? - What tensions became apparent when you tried to incorporate sustainability? - Were there different opinions on the necessity of including sustainability? - How was the weighing of different options for this project done? - Did the process help to facilitate the degree of sustainability of the project?	To get an understanding of the IIDM process for capital investment, how sustainability is integrated and how potential tensions are managed through the process
Product Development	- How does the product development process work? - How and when is sustainability considered in this process? - What was a recent project you were involved in? What was your role? - What was the context of the project and how was sustainability included? - What influence does the PCF tool have on the project? - What were major tensions in the process in regards to sustainability? - How were these tensions managed? - How do you decouple growth from Scope 3 emissions? - How do you manage the conflicting targets? - How is Scope 4 emissions discussed and used?	To get an understanding of the IIDM process for product development, how sustainability is integrated and how potential tensions are managed through the process