Enhancing Sustainability in the Supporting Activities of an Engineering Consultant Organization

Master Thesis

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Royal HaskoningDHV
Enhancing Society Together

Colophon

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Executive Summary

Organizations play a crucial role in the transition towards a sustainable society. The impact of the construction industry on a global scale is very significant in terms of resource usage, employment and emissions. There is an ever-increasing focus on sustainability of companies and especially those that impact our global environment. Therefore, the construction industry is focusing more and more on the sustainability of their organization. However, companies are still struggling to find the most effective ways to become more sustainable. Research has so far mainly been focused on the primary activities within an organization. Apart from the primary activities, engineering consultants within the construction industry have a large amount and variety of non-primary or supporting activities (SA). Given the impact that these companies have it is important to understand not only how the primary activities but also how the SA of such companies can become more sustainable.

The main research question therefore is: *What are the defining moments in the enhancement of sustainability in the supporting activities of an engineering consultant organization?*

To answer the research question, first an understanding on organizations in general and the organizational structure of engineering consultants is created by a literature review. For this, the organizational model of Mintzberg and the value chain model of Porter were examined. This resulted in insight that SA differ per organization and involve activities such as human resource management; firm infrastructure; and procurement. Second, research is done on sustainability within organizations. Hence, the term corporate sustainability is introduced, involving the balance between the company system; stakeholders; and sustainability. Third, drivers and barriers (D&B) for sustainability in organizations are identified, forming the playing field for the empirical research. This resulted in nine categories of drivers, including: costs; management support; government; awareness; technology; competition; reputation; demand or pressure from external parties; and intrinsic motivation. Eleven categories of barriers were identified, including: costs; management support; government; awareness; technology; knowledge. skill and information; time; support from employee or partners; competition; risk; and intrinsic motivation.

The empirical part of this research comprises a case study of the engineering consultant organization Royal HaskoningDHV (RHDHV). Within this organization eight cases are looked at, which are initiatives with the goal to enhance sustainability within the organization its SA. The method for the case study is a process research, through which the process of change towards sustainability is examined. For each case, the process is mapped using data that is collected through qualitative interviews and assembling case documentation. The process maps, together with narratives of the processes, have the goal to create an understanding of the how and why of these processes.

The collected data is analyzed by making use of decision-making theory (DMT), more specifically using the streams model. Within this model, the problem, solution and participant streams within a decision-making process are identified. Possible window of opportunity (WOO) and tipping point (TP) are also identified. A WOO is a brief moment in which it becomes possible for the streams to be coupled and therefore for decisions to be made. A TP is a point in a process when a critical mass has been reached, where after abrupt change follows. The concepts of streams model, WOO and TP are depicted in Figure 1. The processes of the cases are also analyzing on the basis of the found D&B. The analyzed processes are further examined through a cross case comparison, finding patterns and making striking observations throughout the cases.

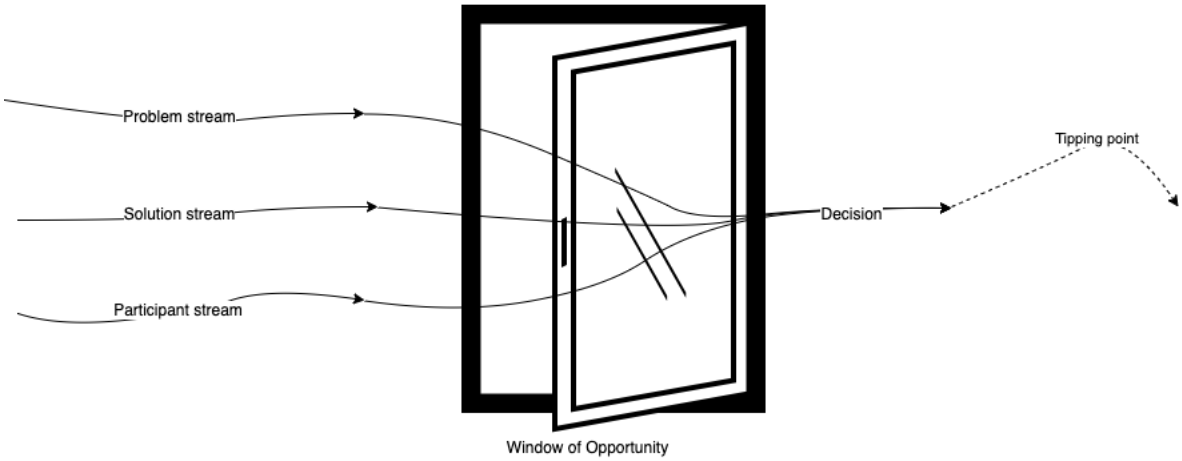

Figure 1: Schematic representation of DMT concepts

The analysis of the process maps and comparison of the analyses of the cases lead to the identification of different patterns and striking observations. Regarding the streams, it was identified that most problem streams include the CO2 emissions. The WOO was in most cases formed by either raised awareness or multiple events making the problem more pressing. There were no significant TP identified throughout the cases. Regarding the D&B, it is observed that awareness and intrinsic motivation form the most important drivers. The most important barriers are costs; the lack of support from employees or partners; and the lack of intrinsic motivation in the form of a lack of vision and priority.

The conclusions of this research involve the answer to the main research question and comprise: the main observations of the analysis; the recommendations regarding these observations; and the methodology. Four main striking observations are identified:

- The first observation is the intrinsic motivation of individuals playing a big role in the enhancement of sustainability;
- The second observation involves that RHDHV seems to hook onto trends and external events;
- RHDHV is only picking low hanging fruit, by making use of changes that are already planned or taking place, forming the third observation;
- The fourth observation comprises that there is a lack of clear goals, vision and priority regarding sustainability within the SA.

The linked recommendations are to create a supportive and open environment for individuals that are motivated to enhance sustainability; to make use of external events, trends and of changes that are already lined up, but to not let these external occurrences determine the path towards sustainability; and to develop clear goals and a strategy for sustainability in the SA, for a more integral approach. The methodology of mapping the process; understanding the streams, WOO and possible TP; and relating these findings to the drivers and barriers, can be applied in other organizations. This creates insight in the process of enhancing sustainability, from which lessons can be learned. Recommendations for future research include executing this research in other sectors and by applying the rounds or phase model for analysing similar processes.

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Lists of figures and tables

List of Abbreviations

RHDHV	Royal HaskoningDHV
CS	Corporate Sustainability
SA	Supporting Activities
ESG	Environmental, Social and Governance
D&B	Drivers & Barriers
SDG	Sustainable Development Goals (from the United Nations)
DMT	Decision making theory
WOO	Window of Opportunity
TP	Tipping point
HRM	Human Resource Management
QHSE	Quality, Health, Safety and Environment
WPS	Workplace solutions
I&B	Industry & buildings
FM	Facility Management
CG	Corporate Group
RSB	Responsible and Sustainable Business
KVE	Kantoor Vol Energie
AKEF	Amsterdams Klimaat en Energiefonds
GDCI	Green Deal Circulair Inkopen (Green Deal Circular Procurement)
GD	Green Deal
SKAO	Stichting Klimaatvriendelijk Aanbesteden en Ondernemen
UNPRI	United Nations' Principles for Responsible Investments

1. Introduction

The construction industry is a competitive and complex system of many different types of organizations of different scales (Cakmak & Cakmak, 2014). Organizations within the construction industry exist in various forms, such as contractors, engineering and project management companies. Such organization can have various focusses, for example construction, civil engineering or architectural design. This research focusses on engineering consultant organizations.

Those organizations play a crucial role in the transition towards sustainability in society and have tended to put a greater focus on sustainability within their organization in the past decades (Baumgartner & Rauter, 2017). However, the transition towards sustainability is complex (Cushman, Cornford, & Venters, 2005). Organizational change has the aim to move from the current state of the organization to a more desirable state, representing opportunities, new processes and technologies (Lozano, Nummert, & Ceulemans, 2016). In regards to organizational change, sustainability is addressed considering internal, connecting and external drivers and the relations between these drivers (Lozano & von Haartman, 2018). Additionally, the environmental, social, economic and time dimension, and their interrelations are considered (Witjes & Lozano, 2016). For organizations in any industry to operate in a sustainable way, the organizations have to be considered holistically. Taking a holistic approach in transition means that all aspects of organizations and their interrelations have to be considered in order for an organization to change. Not only the primary activities in the value chain of an organization have to be taken into consideration, but also the secondary activities have to be taken into account.

The construction industry uses a large amount of energy and materials, and produces lots of waste and CO2 emissions (Ortiz, Castells, & Sonnemann, 2009). Hence, the construction industry is confronted with more pressure to improve their performances regarding sustainability (Cushman et al., 2005). The design and engineering activities of engineering consultant organizations impact the built environment. This in turn has environmental impact, which has been a concern for engineers and architects for centuries (Collin, Linnet, & Secher, 2018). In this research the transition towards sustainability in the supporting activities (SA) of an engineering consultant organization within the construction industry is examined.

The engineering consultant organization that is the focus of this research is Royal HaskoningDHV (RHDHV), which is an independent international engineering and project management consultancy. This research came into being through the wish of the board and the employee council of RHDHV. Sustainability is an important topic on their agenda. RHDHV wants to be sustainable throughout the whole organization and are already achieving good sustainable results with their primary activities. The focus for this research study is on their secondary activities, namely the operational management of the organization, comprising the SA.

The rest of this chapter is structured as follows. First, the problem that is researched is elaborated on, divided in the practical problem, research gap and the objective of this study. Second, the main and sub research questions are given, each followed by the methodology to answer these questions. Section 1.3 goes into the preliminary research that is conducted at the start of this research, creating insight in the emergence and relevance of the study. In section 1.4 the method of the literature study is elaborated on, serving as an introduction to the subsequent chapter.

1.1 The Problem

As society is becoming more aware of environmental issues, there is a growing interest in possibilities of mitigating the negative impacts (de Paula, Arditi, & Melhado, 2017). The growing concerns about the negative impact on the environment have led to the accusation of companies for being responsible for a great part of these impacts. Therefore, organizations play an important role in the debate of sustainability (Lozano et al., 2016; Stewart, Bey, & Boks, 2016). Many steps have already been taken within companies, as many corporations have shown through Sustainability Reporting for example as a part of Annual reports (Lozano et al., 2016). Organizations increase focus on corporate sustainability (CS), circular economy, the triple bottom line (people, planet, profit) of sustainability, or on the Sustainable Development Goals (SDG) is to add value (Maletič, Maletič, & Gomišček, 2018) and to maintain or improve their reputation, which they might feel obligated to in order to be economically sustainable (Baumgartner & Rauter, 2017).

1.1.1 Practical Problem

RHDHV is on a mission to become market lead in having a positive impact on sustainability. RHDHV gives advice to clients regarding sustainability in their organizations or works in projects concerning sustainability. They want to "practice what they preach" and also be sustainable in their own organization, and specifically in the SA of their organization. RHDHV has in the past few years already acted in enhancing sustainability in their SA, but they want to do more. Research on sustainability in projects is abundant and RHDHV has already gained knowledge on how to improve sustainability performances through their projects (Stel, 2019). Now the focus is on getting more insights in sustainability within the SA of the organization.

1.1.2 Research Gap

Many organizations are still struggling to manage all the dimensions of sustainability in their daily operation (Støre-Valen & Buser, 2019). There is a need for more research on drivers and barriers (D&B) for sustainability change, and their influence on organizations (Lozano & von Haartman, 2018). Research on drivers or barriers for sustainability in organizations that has been conducted to date has focused on solely the drivers or the barriers; specific industries such as metal manufacturing; primary activities of the value chain of organizations; and management strategies or approaches to sustainability (Engert, Rauter, & Baumgartner, 2016; Lozano & von Haartman, 2018; Orji, 2019; Stewart et al., 2016).

Much research to date focuses on identifying D&B for sustainability in organizations, through literature reviews, questionnaires or case studies (De Jesus & Mendonça, 2018; Domingues, Lozano, Ceulemans, & Ramos, 2017; Giunipero, Hooker, & Denslow, 2012; Lozano & von Haartman, 2018; Seidel, Recker, Pimmer, & vom Brocke, 2010; Stewart et al., 2016). However, these studies do not focus on the processes of enhancing sustainability or the D&B playing a role in these processes. The narrative of how these D&B for sustainability also played a role, has not received attention in literature.

Not much research is conducted on sustainability and the effects of sustainability in all parts of organizations. Hence, there is a need to research the different processes and their links within organizations (Domingues et al., 2017). Sustainability with respect to SA is rarely studied, and therefore forms the focus in this research.

1.1.3 Objective

The objective of this research is to understand how organizations enhance sustainability in their SA. The understanding is created by providing insight in the process of engineering consultant organization RHDHV enhancing sustainability in their SA. The insight is created by looking at the processes of accomplished internal projects and initiatives within the SA in which sustainability performance has been improved.

This research looks into this matter by means of a case study in which one organization, being RHDHV, tries to enhance sustainability in their SA. Within the case company several cases are looked at, which are the internal projects and initiatives that are enhancing sustainability in the SA.

1.2 Research Question

Internationally and nationally there is an increasingly regulatory influence on sustainability. For example, the National Climate Agreement in the Netherlands, in which individuals and companies are urged to make changes towards a reduction of 49% of the greenhouse gasses in 2030 compared to the 1990 levels (*Draft National Climate Agreement - The Netherlands*, 2019). Regulations tend to become stricter, for example in 2050 a reduction of 95% is required. As a result, companies are feeling the urge to not only follow the regulations, but also be ahead of the regulations with respect to sustainability. In order to take steps forward, barriers have to be overcome, and drivers have to be enhanced in regard to sustainability. Organizations are not fully aware of which barriers they need to overcome or drivers they need to enhance to further implement sustainability in their daily processes. Hence, this research focusses on how organizations enhance sustainability within their daily SA.

1.2.1 Research Question

The main research question that is answered in this research is defined as:

> *What are the defining moments in the enhancement of sustainability in the supporting activities of an engineering consultant organization?*

The research is qualitative. The empirical research comprises a case study, where several projects and initiatives within the organization from the sub cases. To answer the main research question, several sub research questions are formulated and used to build up the chapters. In the following section, the sub questions are introduced, and the methodology related to these questions is elaborated on.

1.2.2 Sub Questions

The first sub question, that is the focus of chapter 2, is the following:

> Sub question 1: *What are the most important drivers and barriers for sustainability in the supporting activities of an organization?*

This question has the aim to provide the theoretical framework that forms the basis for the empirical research. This is done by executing a literature study. Through looking into theory on organizations, insight is created in the structure of organizations. The focus of this research is on the SA of an organization. Therefore, the SA in general are elaborated on by looking into several theories on organizations.

As sustainability is a broad concept, it is looked at in relation to organizations. Sustainability in this context is defined as CS. Adding to this, the most important D&B for sustainability in organizations are identified from literature. These D&B lead to insight in important aspects of the process towards sustainability and therefore form the playing field for the empirical research. Moreover, decision making theory (DMT) and related concepts are looked into to create a basis for the analysis of the process maps that follows in chapter 4.

> Sub question 2: *How can be established how the process of enhancing sustainability in the supporting activities within an organization takes place?*

This second sub research question forms the focus of the methodology chapter. The aim of this question is to create insight in the method needed for the empirical part of this research. The goal for this method is to create an understanding of the process of enhancing sustainability in the SA. Focus is on process research, which includes the mapping of the processes and creating a narrative to explain the processes of enhancing sustainability. Processes are mapped through performing a case study including collecting data through conducting semi-structured interviews and collecting case documentation. Furthermore, in this methodology chapter, the method of data analysis is elaborated on, which involves analyzing the cases by comparing several aspects. Aspects that are looked into are characteristics of the cases; D&B; and the concepts of DMT that are introduced in chapter 2.

> Sub question 3: *How is sustainability enhanced in the supporting activities of an engineering consultant organization?*

The third sub research question will provide insight in the results of the case study. The case study exists of one organization with multiple cases being looked at within this organization. The sub cases are internal projects and initiatives, in which sustainability has been enhanced within the SA. Within the cases is zoomed into the process of change, mapping the events and understanding the how and why.

The results chapter is built up by first describing the process within the sub cases. Second, the interpretations of the processes are elaborated on. These interpretations comprise the analysis of the processes regarding decision making, including the streams model for analysis of the processes and the concepts window of opportunity (WOO) and tipping point (TP). The cases are also compared in this chapter, and from this comparison followed the patterns and striking observations. The chapter is concluded by a narrative of the most striking observations.

> Sub question 4: *How can the findings of the case study contribute to enhance sustainability in supporting activities of engineering consultant organizations?*

The last sub research question is the focus in the fifth chapter of this thesis. Through this question, the link between the results of the case study and the findings from literature is made. This is elaborated on through dividing the implications for theory in three parts, namely the implications regarding D&B and regarding DMT. Moreover, the implications for engineering consultant organizations are explained. In the discussion chapter the coronavirus also is elaborated on. This virus caused a pandemic during the period this research was executed. The discussion chapter ends with the limitations of this research.

1.3 Preliminary research

In preparation for the literature and case study, preliminary research is conducted. The preliminary research has the goal to create a better understanding of the organization of the case study. Insight is created through informal exploratory meetings with several employees of the organization. Subsequently, a survey is held in collaboration with the employee council, in which employees are asked for their input for ideas on enhancing sustainability in the SA. Also, a voting procedure during one of the meetings with the board and employee council is held. The informal meetings, survey and the outcome of the vote lead to a selection of cases for the case study. The selection consists of projects and initiatives to enhance sustainability within the SA of this organization, which form the sub cases within the case study.

1.4 Literature study

The literature review of this research, which is presented in the following chapter, has the aim to give insight in the different concepts of interest in this study, setting a theoretical framework for the rest of the study. First, theory on organizations is elaborated on, introducing different perspectives on organizations and the organization models by Mintzberg (1979) and Porter (2011), including the concept of SA. By looking into literature on organizations, an understanding is created on the structure and perspectives of organizations in general. Also, this will create the possibility to place the organization of the case study into context.

Second, sustainability in relation to organization is explained, with the aim to demarcate the broad term sustainability. In this part of the literature study the role that organizations have in reaching sustainability goals is made clear, through looking at what sustainability means and into literature on CS.

Third, the most important D&B for sustainability are researched, through a literature research. In academic literature drivers, enablers and other terms such as motivations or supporting factors, can be labelled as having positive effects on the process towards sustainability. Barriers and hindering factors have negative effects on this process. This research builds upon and sources D&B from literature as listed in Table 13 (appendix). In this literature, the combination of the concepts D&B is more commonly used than the also appearing combination of enablers and barriers. Therefore, the choice is made to focus on drivers as the motivation for sustainability and barriers as obstacles that need to be overcome in order to achieve sustainability in organizations. This research into D&B leads to the playing field for the empirical research, consisting of the most important factors for change related to sustainability.

The last part of the literature study comprises DMT in order to create an understanding of the processes that were mapped within this study. In this part is looked into three different perspectives on decision making processes within organizations from Teisman (2000). The choice is made to focus on one of these three models, namely on the streams model. The concepts WOO and TP are looked into. A WOO is a concept within the streams model. A WOO might lead to a decision potentially causing a TP in a process.

2. Literature

The literature study that is part of this research study is discussed in this chapter. The goal of the literature study is to create an understanding of the different concepts of interest and their relations in this study. In this chapter the first sub research question *What are the most important drivers and barriers for sustainability in the supporting activities of an organization?* is at focus.

In this chapter first the organization theory and supporting activities (SA) are elaborated on, creating insight in different theories on organizations to understand the structure of organizations in general. Moreover, by elaborating on SA it will become clear what activities of organizations is focused on in this study. As sustainability is a term that has multiple definitions and can be interpreted in different ways, the concept of sustainability in organizations is elaborated on in the second part of this chapter. In the third part of this chapter (2.3) the drivers and barriers (D&B) for sustainability in organizations are elaborated on. This part will create insight in aspects that have a positive or negative effect on the transition towards sustainability in organizations. The last section of this chapter, section 2.4, focusses on decision making theory (DMT), which will form the basis for analysis of the data collected in through the case study. This section will provide information on what decision making is and on different models for the analysis of decision-making processes. In this last part is also focused on one of these models, namely the streams model, and on the related concept of windows of opportunity (WOO). Elaboration on tipping points (TP) will conclude this chapter, which is a concept that is related to DMT, and can exist within a process of transition towards sustainability.

2.1 Organization Theory and Supporting Activities

This research focusses on sustainability within an organization, therefore in order to understand organizations, the starting point of this literature study is organization theory and its definition. According to Jaffee (2001) there is a lack of consensus on the meaning of organizational theory and therefore many scholars have chosen to outline this theory in alternative ways as opposed to writing down a single-sentence definition. Scott (as cited in Jaffee, 2001) presents organizations through its elements, being social structure, participants, goals, technology and environment. Organizations can be companies, but also civil society at large, education institutions, and organizations in the public sector. Individuals can be members of an organization and can leave and be replaced by others within the organization, but the individual itself is not an organization. Organizations may house in a building, but the building itself is not the organization. Within this perspective, described by Tolbert and Hall (2015), organizations are abstract entities, such as markets, industries or groups. Tolbert and Hall (2015) agree with the above given statement of Jaffee (2001) about the lack of consensus on the definition of organizational theory. They add to the statement that in attempts of defining organizations the following elements appear: two or more members, a single goal or set of goals that guide the members, different roles given to different members and containing an authority system, such as management.

In the past decades, many theories on organizations and their structures have emerged, of which the theories of Mintzberg and Porter are often mentioned (Daft & Lane, 2007). Mintzberg (1979) developed a model (Figure 2) that defines organizations as a combination of five parts, namely strategic apex, technostructure, middle line, support staff and the operating core. Porter (2011) developed a framework (Figure 3) called the value chain model. This model first appeared in 1985 serving the goal to understand the source of the competitive advantages of organizations and how to strengthen them.

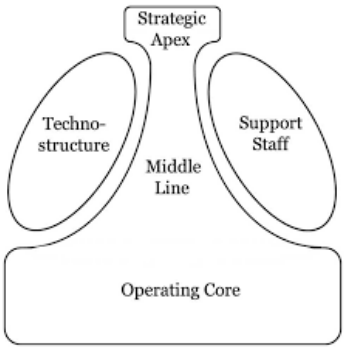


Figure 2: Organization model (Mintzberg, 1979, p. 20).

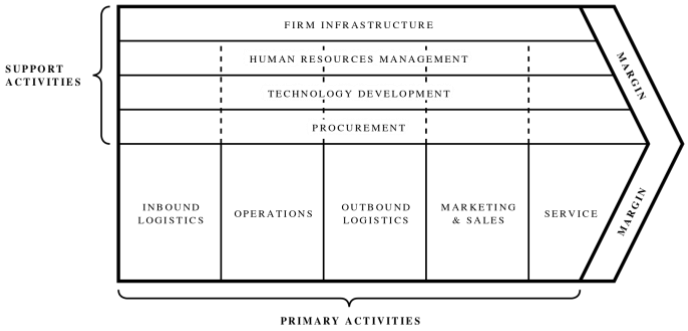


Figure 3: Value chain model (Porter, 2011, p. 41).

In the value chain model of Porter (2011) there is a clear separation of primary activities and secondary, SA of an organization. Porter uses the model as a representation of the collection of activities that make up an organization. Together these activities create products or services that are valuable to its buyers or clients. The primary activities comprise the production or creation of the product or service, sale and transfer to the buyer or client and possible after-sale support. The SA comprise firm infrastructure, HRM, technology development and procurement, that all support the primary activities of the firm and each other. In the model, the dotted lines represent a link between the primary activities and the three last mentioned support activities. SA grouped under firm infrastructure are amongst others general management and finance, and support the whole chain (Porter, 2011).

Mintzberg's (1993) five parts of an organization will be used as perspectives in the case study. The strategic apex is the top management of an organization and its direct support staff. The middle line of an organization consists of the middle- and lower-level management. The technostructure of an organization are analysts such as engineers, accountants, planners, researchers and personnel managers. The operating core comprises the employees who deliver the organization's services. Mintzberg (1993) describes the supporting services, in the model in Figure 2 called the 'support staff', as the indirect support of the primary purpose of the organization. These support services have their own specialization to serve the organization, outside of the direct purpose of the organization, trying to positively affect the effectiveness and efficiency of the organization. The SA differ per organization but can comprise public relations, research and development, payroll administration, legal counsel and the cafeteria.

2.2 Sustainability in Organizations

Sustainability has been a hot topic in literature and in organizations for the last decades (Lu & Zhang, 2016). Research aims to address environmental, social and economic issues of this generation and future ones (Witjes & Lozano, 2016). Apart from the environmental, social and economic viewpoint, a fourth aspect has been added to these dimensions, namely the time dimension (Witjes & Lozano, 2016). Together these dimensions and their interrelations form a holistic perspective on sustainability (Witjes & Lozano, 2016). Organizations play an important role in driving sustainability (Lozano, 2018) and within organizations sustainability is being recognized as a key factor for company success, by integrating environmental, economic and social perspectives in their strategies (Lu & Zhang, 2016). Furthermore, in relation to organizations, the term corporate sustainability (CS) has emerged in academic literature, since the pressure on organizations to address environmental and social issues has been recognized (Linnenluecke, Russell, & Griffiths, 2009). CS is defined as creating value for shareholders on the one hand, and on the other hand taking in consideration and balancing the economic, environmental and social dimensions (Daddi, Ceglia, Bianchi, & de Barcellos, 2019; Hahn, Pinkse, Preuss, & Figge, 2015; Lu

& Zhang, 2016).Lozano, Suzuki, Carpenter, and Tyunina (2017) add the time dimension in the definition of CS and have created a three-axes framework including this dimension. In the CS model in Figure 4 it is shown that CS is in between the complexities of company systems, internal and external stakeholders and the four dimensions of sustainability. In the company system depicted as one of the three axes of this model, the SA can be identified in organizational systems and supply chains, which amongst others include communication, marketing and procurement.

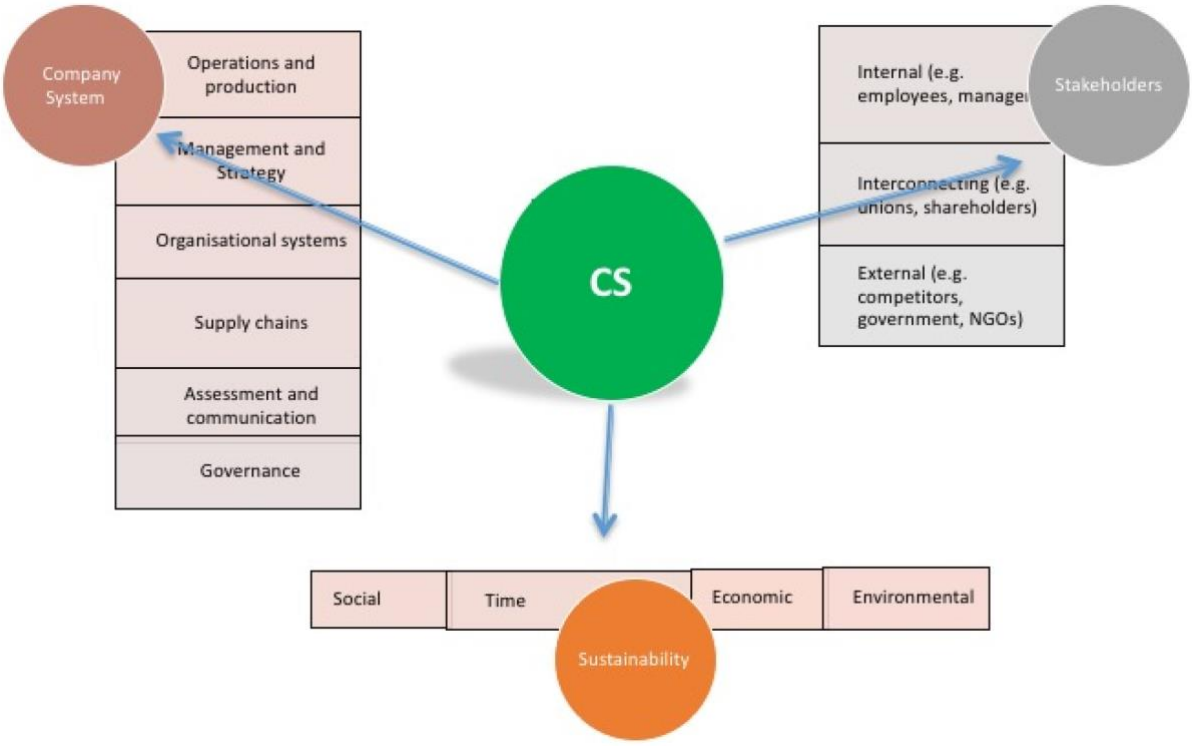


Figure 4: Framework of CS (Lozano et al., 2017, p. 4).

2.3 Drivers and barriers for sustainability

Drivers influence and support organizational change to sustainable performance (Orji, 2019). Engert et al. (2016) elaborate on internal as well as external drivers as issues or reasons that explain why the incorporation of sustainability in organizations is important. Barriers can hinder organizational change for sustainability and by identifying these barriers, this can help in forming a strategy to overcome the barriers and to incorporate sustainability in an organization (Orji, 2019). In order for transition towards sustainability to take place, barriers for sustainability need to be overcome. Adding to this, further strengthening drivers can influence organizations to engage in sustainability (Caldera, Desha, & Dawes, 2019). Barriers for change towards sustainability in organizations can be overcome by drivers that support sustainability (Orji, 2019).

Literature that identifies D&B regarding sustainability in organizations is broad, as follows from the given examples of literature in this section and in Table 13 (in the appendix). Tura et al. (2019) divide D&B, for the development and implementation of circular economy in business, in seven categories. Other studies shed light on solely barriers or drivers, or in specific fields. An example of this is an article on facility management (FM), where the main barriers are a lack of clear financial benefits of the sustainable implementation and end-users that are not fully supportive of the sustainable initiatives (Støre-Valen & Buser, 2019).

Caldera et al. (2019) propose a conceptual framework (Figure 5) including D&B, based on 'green and lean' literature and theories that form the basis of general green and lean literature. The drivers form the motivation to use a tool implementing green and lean theory towards the outcome which is sustainable business practice. The enablers facilitate the change and the possible barriers have to be overcome in order to accomplish the change towards sustainability.

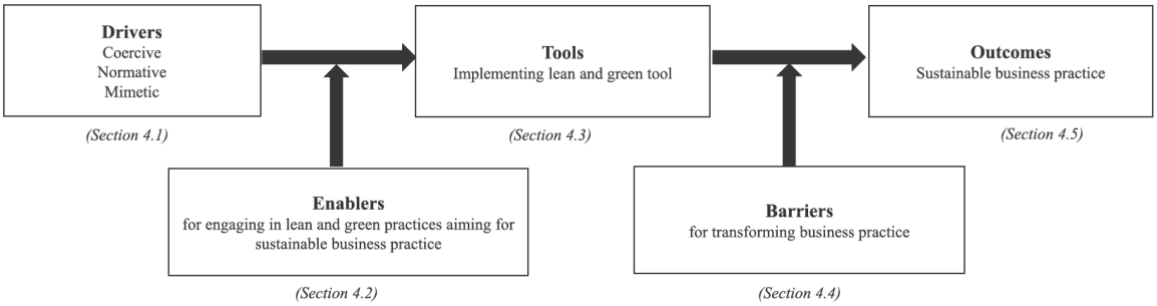


Figure 5: Conceptual framework proposing the relation between drivers, enablers, tools, barriers and outcomes (Caldera et al., 2019, p. 579).

In this study is chosen to focus on drivers as the motivation for sustainability and barriers as obstacles that need to be overcome in order to achieve sustainability in organizations. The choice is made to focus on solely D&B, and not on the other concepts such as the ones in the figure above, because this combination of terms is most common in literature, as opposed to the use of related combinations such as enablers and barriers. Search results in database Scopus give 5924 hits for documents that have 'drivers' and 'barriers' in either the title, abstract or keywords, whereas 'enablers' and 'barriers' yield 2883 documents, and using search words 'enablers' and 'drivers' and 'barriers' result in only 124 documents.

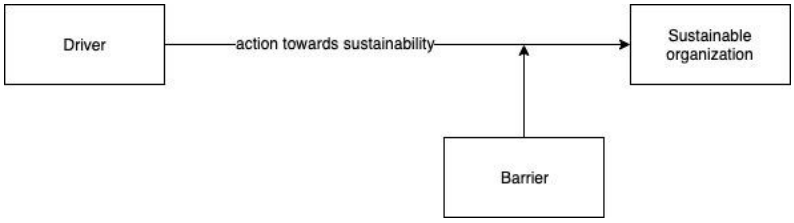


Figure 6: Conceptual framework proposing the relation between D&B in regard to actions towards sustainability for sustainable organizations.

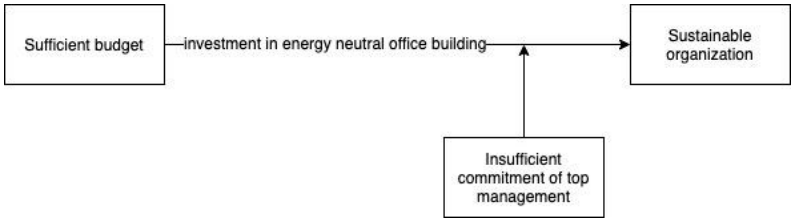


Figure 7: Example of driver 'sufficient budget' to a possible action towards sustainability 'investment in energy neutral office buildings' with barrier 'insufficient commitment of top management' towards a sustainable organization.

The conceptual framework depicting the combination of D&B is shown in Figure 6. An example of this given in Figure 7, of a driver for sustainability and a barrier negatively impacting the process towards sustainability. In the conceptual framework (Figure 6) it seems as if any specific driver has a particular barrier working against the action towards sustainability, but this is not necessarily the case. Orji (2019) elaborated on the direct influence of specific drivers on specific barriers, ultimately ranking the highest influential D&B for sustainable performance. This is followed by the statement that the influential drivers found can remove the key barriers for change towards sustainability in organizations. This implicates that a group of drivers can overcome a group of barriers, not necessarily one specific driver overcoming one specific barrier.

Recent studies on D&B that has been reviewed is mainly focused on organizations in general or on sectors rather than a single organization (Table 13, in the appendix). The D&B that have been identified from literature are listed in Table 14 (in the appendix), containing the drivers, and Table 15 (in the appendix), containing the barriers for sustainability in organizations. All the D&B are categorized in nine categories of drivers and eleven categories of barriers. The D&B were identified in literature on organizations and sustainability. However, this literature is different in comparison to the subject in this study, as literature specifically on D&B for engineering consultant organizations is nonexistent.

2.4 Decision making theory

In the transition towards sustainability that is taking place within organizations many different decisions have to be made. The processes of the transition towards sustainability are mapped as a part of the processing of the data and will be elaborated on the subsequent chapters. To further explain these processes that took place in each of the cases, a link is made with theory on decision making. In decision making, a problem, issue, condition, opportunity or system needs to be solved, changed, improved or transformed. It partly involves predicting a future situation and anticipating on this guess of a future situation (Bennet & Bennet, 2008).

Bennet and Bennet (2008) lay the groundwork for decision making in complex situations, by explaining concepts such as the TP. The TP according to Bennet and Bennet (2008) is the unpredictable moment when a slow changing process reaches a point causing a large change.

The collected data from this research includes decision making processes. Therefore, the data analysis involves analyzing these processes. Teisman (2000) elaborates on analyzing complex decision making by distinguishing three models that characterize what decision making is and how decision making can be analyzed. The three models are the phase model, stream model and rounds model. In this chapter, first the phase model is explained and secondly the rounds model is elaborated on. Subsequently, the streams model is explained, in which the theory on WOO is a part. Lastly, the TP concept and its characteristics is elaborated on.

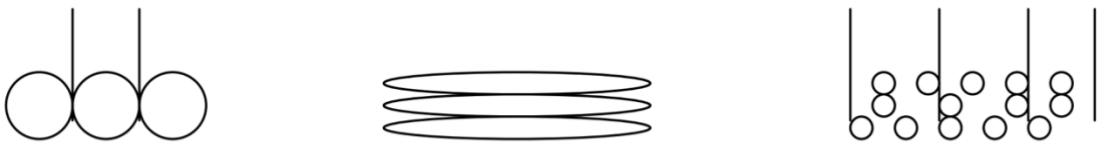


Figure 8: Phase model, stream model and rounds model (Teisman, 2000, p. 939).

The phase model

In the phase model decision making happens through different phases that follow each other, distinguishing five phases within this process. The first phase is made up of defining the problem and presenting solutions, which is followed by formulating policies to bring specific problems to the attention. In the third stage the propositions for policies are adopted, after which these policies are implemented, forming the fourth phase. The final phase comprises the evaluation of the implemented policies, whether they have achieved the proposed goals (Teisman, 2000).

The rounds model

The second model for analyzing complex decision making is the rounds model. In this model, decision making is seen as a process existing of multiple rounds wherein decisions are made by interactions between different stakeholders. In this model the actors are the point of focus and many actors are involved in decision making, but problems and solutions are not linked to a specific actor, as in the phase model. The process within this model is seen as interactive, where a decision is made based on a series of decisions made by various participants in different rounds. A decision-making round consists of combinations of sets of problems and solutions, coming to attention through interactions between actors. The decision-making rounds are distinguished at the end of the process, by determining the most important decisions made in the process (Teisman, 2000).

The streams model

Teisman (2000) elaborates on different models that fit within the category of the streams model. The garbage can model is developed by Cohen, March, and Olsen (1972) and the multiple streams model of Kingdon (2013) is based on this model. There is a strong relation to these two models, and the explanation of the garbage can model helps to understand the streams model. Therefore, first the garbage can model is elaborated on, after which the streams model by Kingdon (2013) is explained.

The garbage can model is described as a model on decision making in organizations, wherein there are four separate streams being problems, solutions, participants and choice opportunities (Cohen et al., 1972). The garbage can model is considered for organized anarchies. Organized anarchies are explained as organizations, or situations in which decisions have to be made, with an inconsistent set of preferences, unclear internal processes and fluid participation, meaning that the time spend on different segments differs (Cohen et al., 1972). In the garbage can model, the choice opportunity is seen as the garbage can wherein participants dump problems and solutions. The outcome is a function of the garbage in the can, the mix of problems, solutions, participants and their resources. There are various garbage cans, so it could be that the mix in one can does not resolve the problem in that can, whereas another can might contain the solution and right participant for that specific problem (Kingdon, 2013).

Within the time constraint of this research it is chosen only to focus on one of the models of analyzing decision making. Of the three models, the streams model is chosen as the model of analysis of the processes in this research study. This model is chosen for its relation to the WOO, as in this research these WOO in relation to transition towards sustainability is looked at. Furthermore, the phase model does not seem in place as there are no clear phases to be distinguished in the analyzed processes. The rounds model is less relevant, as the actors within the processes are mainly from one organization, whereas this model focusses on the interactions between various actors (Teisman, 2000).

The stream model is explained as three streams that exist separately, but also interact with each other. One of the separate streams is the stream of problems, another is the policies and solutions stream, the last is the politics or participants stream. Decision making in this model is seen as the interaction between streams (Kingdon, 2013).

Problem stream – In the problem stream, a problem is something that, in the opinion of participants, should be changed to a more desired state and that therefore requires action. Problems do not suddenly appear, as they have to be defined by someone (Knaggård, 2015). Problems perceive attention through indicators, such as monitored patterns, rates or costs, outcomes of studies or surveys, revealing the problem to participants (Kingdon, 2013).

Solution or policy stream – Knaggård (2015) describes that within the policy stream, participants are active and they are generally the ones that develop and prepare solutions or policies to present to policy makers. Solution are prepared in the form of proposals, that are worked out before problems appear. The policy makers, in their turn, ought to make the right decision after the problems and solutions are presented by participants (Cairney, 2018).

Participant or politics stream – Kingdon (2013) uses the term policy entrepreneurs for advocates that propose ideas, the importance of those ideas and they try to find existing problems for their solutions. They can be politicians, lobbyists, researchers, or any other people and can be from inside as well as outside the organization (Guldbrandsson & Fossum, 2009). In this thesis the policy entrepreneurs will be described as participants. In the politics stream participants develop solutions and propose these solutions for a given problem (Cairney, 2018; Knaggård, 2015). The process within this stream concerns already prepared solutions being matched by participants to problems, it is not so that participants develop solutions when problems are presented by policy makers. The attention of policy makers might move from one problem to another, whereas the participants stick with one specific problem or solution (Guldbrandsson & Fossum, 2009). Béland (2016) describes the participants as the most important factor in the multiple streams model together with the timing of these participants to propose problems and solutions.

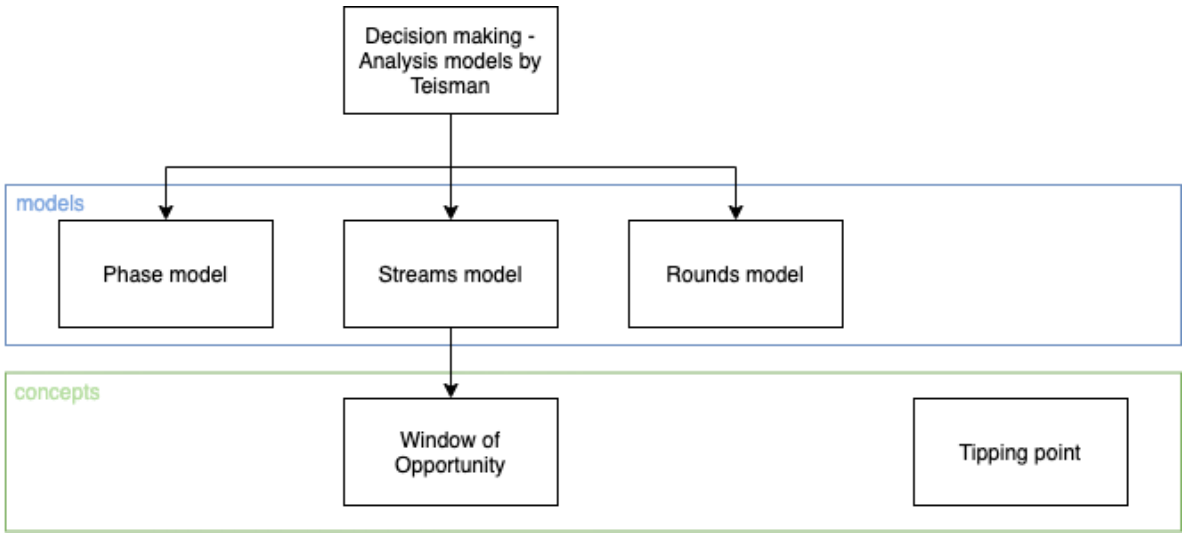


Figure 9: Schematic representation of the models of analysis and concepts in decision making.

The figure above (Figure 9) provides an overview of the concepts of decision making that are explained within this chapter. The three models of analysis of decision making processes from Teisman (2000) are depicted together with the concept of WOO which is related to the streams model. Moreover, the concept of TP is related to DMT in general but is not directly related to one of the three models of analysis of decision-making processes.

2.4.1 Window of opportunity

In rocket launching, the WOO represents the moment when the launch of a space shuttle is possible (Kingdon, 2013). In this moment, conditions are such that the rocket will be able to reach its target. When launching a rocket, this WOO lasts a short period of time, and when the opportunity is not used, it might take a long period of time until a next window might open (Kingdon, 2013).

The WOO is an important concept within the multiple streams model of Kingdon (2013). Kingdon (2013) has researched the streams model in relation to WOO for policy makers in government decision-making situations. He adapts the line of thought of the garbage can model in the multiple streams model, through which he tries to understand processes within the federal government, and distinguishes the problem, policy and politics stream. The separate streams flow through the organization and are joint at critical moments, forming the opportunity for decisions to be made and therefore for big changes.

The WOO, or policy window, is a short opening for participants to push solutions or to put attention on specific problems. As in rocket launching, the WOO might pass quickly, so it is key to make a decision, or no decision, in such a moment. In such an instance, participants must be prepared in order to present specific problems or solutions. Sometimes actors lie and wait for a window to open, because when a window opens it is too late to start developing a solution, therefore it should be prepared in advance (Cairney, 2018; Kingdon, 2013). The window is the critical moment where the streams can be coupled, and change can come about (Kingdon, 2013).

The streams separately are not able to put subjects that need decisions high on the agenda. All streams need to be in the right place, at the right moment in order for a WOO to be used and a decision to be made (Kingdon, 2013). Decision makers have the opportunity during a brief window in which all key elements, being the insight in the problem, prepared solution and the right motive, are coming together (Cairney, 2018). The joint occurrence of events and factors can cause items to be placed high on the agenda of decision makers (Kingdon, 2013). Coupling of the streams is most likely when a window is open (Birkmann et al., 2010) and is depicted in Figure 10.

WOO are opened when a certain problem becomes pressing, for example due to an increase in costs, or an increase of awareness or shift in public opinion (Kingdon, 2013). When cogent problems appear, due to big disasters (Birkmann et al., 2010; Garmestani, 2014) such as the BP oil spill in the Gulf of Mexico (Garmestani, 2014) or the global economic crisis in 2008 (Cox & Béland, 2013) windows can also open. Furthermore, an alteration of policies (Birkmann et al., 2010) or changes in staff such as new hires, or changes in positions can cause windows to open (Birkmann et al., 2010; Thompson & Green, 2005). WOO can also appear when new projects are started, in the design phase, or when contracts are negotiated (Thompson & Green, 2005).

Disasters and crises can be a WOO for change (Birkmann et al., 2010; Fouqueray, Charpentier, Trommetter, & Frascaria-Lacoste, 2020; Moser & Dilling, 2007), on the one hand by attracting attention to ongoing problems or by being a learning moment (Moser & Dilling, 2007). Adding to this, such situations might lead to action, as the situation suddenly changed and increases relevance (Moser & Dilling, 2007). On the other hand, disasters can distract from existing problems and even close a WOO (Moser & Dilling, 2007). Social or economic crises can also act as a driver for sustainability within organizations (Lozano, 2015; Lozano & von Haartman, 2018).

As follows from the previous paragraph, there is a link between WOO and drivers. This specific link that is mentioned concerns disasters and crises, as they can form a WOO as well as be a driver of impact and change (Birkmann et al., 2010). This link with drivers also accounts for the earlier mentioned WOO of a problem becoming more pressing as a result of increasing awareness or a shift in public opinion. Increased awareness (Lozano & von Haartman, 2018; Tura et al., 2019) as well as the demand or

pressure of external parties (Lozano & von Haartman, 2018; Orji, 2019), which includes the shift in public opinion, are drivers for sustainability in organizations.

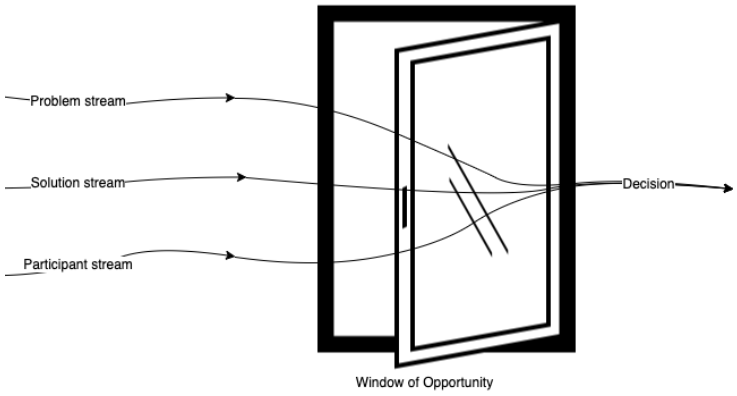


Figure 10: Schematic representation of the streams and WOO.

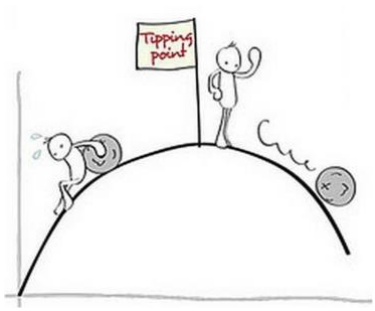


Figure 11: TP ("Tipping point,").

2.4.2 Tipping point

Apart from the point where something can 'tip' over, such as in the case of the ball in Figure 11, the concept TP has many different implications. In academic literature a TP is explained as a moment in time in which an idea, trend or social behaviour triggers a fundamental change. This theory originates from the academic field of public health, more specifically of epidemiology. A process of change can be related to an outbreak of an infectious disease, where the TP is the moment in an epidemic when a certain virus has affected a critical amount of people (Kim & Mauborgne, 2003; Kiron, Kruschwitz, Haanaes, & von Streng Velken, 2012; Ramirez, Selsky, & Van der Heijden, 2010; Shapiro, 2010).

In relation to organizational change, a TP is explained as the moment when an idea has engaged a critical mass of people, resulting often in positive change, such as innovation or improvement (Kim & Mauborgne, 2003; Shapiro, 2010). Ideas as such, that are said to spread like viruses, are called memes, according to Bennet and Bennet (2008). Furthermore, emphasis is put on the importance of advocates, or agents, who are described as people who not only accept and apply change, but also mobilize key players and who demonstrate the value of a certain movement (Kim & Mauborgne, 2003; Shapiro, 2010). In relation to sustainability in organizations, a TP is described as the point at which "a substantial portion of companies not only see the need for sustainable business practices, but are also deriving financial benefits from these activities" (Kiron et al., 2012, p. 70).

Scheffer (2010) touches upon TP in complex systems, in which TP can imply positive as well as negative change (Scheffer et al., 2012). Regarding predicting TP, Scheffer (2010) states that foreseeing radical transitions is still very difficult, however there might be a relation to the presence of TP. Adding to this, even a seemingly small event could trigger a large shift, so predicting whether a system is nearing a TP is very challenging (Scheffer, 2010).

TP are moments of significant and unexpected change, mostly after a long period of no big changes (Cumming & Findlay, 2010). In this light, Scheffer (2010) explains that systems that are nearing a TP seem to recover from disruptions more slowly. This phenomenon is called critical slowing down and might present itself through characteristic changes in the fluctuations of a system. Bennet and Bennet (2008) touch upon the fact that TP are generally unpredictable and mention that a TP can result in a large shift as regards decisions. Therefore, they claim that decision strategies must be flexible.

As TP are generally unpredictable, they often can only be judged when looking back. This also depends on the type and the scale of the change that occurred, as this change might be at individual, organizational, or societal level (Moser & Dilling, 2007). Milkoreit et al. (2018) have attempted to create a better understanding of the current existing definitions of the concept of the TP. Within the definitions of TP there are a number of popular themes, which can be seen as the components or characteristics, used to identify a TP. The four most relevant characteristics mentioned by Milkoreit et al. (2018) are multiple stable states, abruptness, feedbacks and limited reversibility, described in the table below.

Characteristic	**Explanation**
Multiple Stable States	Implying that there should be a big change, something new, and that the new state is lasting.
Abruptness	Non-linearity and out of proportion. A small event causing a much bigger reaction and causing change.
Feedbacks	Also spirals, snowballs, feedback loops. Drivers of change between multiple states of a system. Feedbacks indicate that a portion of the output is used as input in a process or system.
Limited Reversibility	Not being able to switch back to an earlier state, within reasonable time limits

Table 1: Characteristics of TP.

The relation between WOO and TP is elaborated on as follows. In a process, a WOO can occur, forming the moment in which the streams are coupled, and a decision can come about. A WOO can be therefore related to change. The TP in a process is a moment in which certain factors are built up to a specific point where after the process rapidly changes or occurring change suddenly speeds up. On the one hand, a WOO might lead to a TP, because a WOO can cause a decision to be made which can lead to sudden change in a process. On the other hand, a TP can form a WOO for change, as at that specific moment a certain problem might receive more attention forming a window for decision to be made.

To conclude the section on DMT, the explained models and concepts are given in Table 2 to create an overview.

Decision theory model/*concept*	**Explanation**	**This could imply…**
Phase model	Five distinguished phases of decision making; definition of problems, presenting solutions, formulating policies, adopting & implementing policies and evaluation	In the process of the case there seem to be specific phases, such as the definition of the sustainability goal to be reached or declaration of the ambitions, followed by bringing forth possible solution and implementing those.
Rounds model	A process with many actors involved, where several rounds are needed, leading to a series of decisions resulting in a new policy	When a big complex decision has to be made, on a large project or subject, with a lot of people of the organization involved, such as a no flight policy.
Streams model	Where there are different streams, of problems, solutions, and agents; when the streams meet, decisions can be made	In the process at a sudden point, problems seem to appear and at another point solutions seem to come forth, which can be matched by specific actors.
Window of opportunity	Within streams model, moment when conditions are such that a decision can be operationalized	At specific meetings, which take place only once per period, a group of important actors get together and a decision can be made, or due to a temporary regulation a plan can go through.
Tipping point	Moment in which an idea or trend progresses and reaches a critical amount of people resulting in big change	Sustainability gained more attention within the organization, leading to questions and small initiatives, until a certain point when the majority of an organization wants to improve sustainability practice, leading to a big change within the organization.

Table 2: Key models and concepts from DMT in this study.

3. Methodology

The focus of this chapter is on the following sub research question: *How can be established how the process of enhancing sustainability in the supporting activities within an organization takes place?* This research consisted of preliminary research; literature study; data collection through a case study; analysis of the gathered data; and writing of the report. The structure of the report with the related parts of the research study is depicted in Figure 12. The theoretical part of the study comprises of a literature study and creating the methodology. The empirical part of the study includes the case study, in which data is gathered of eight cases within one organization through interviews and relevant documentation. In this chapter is elaborated on the methodology of this research, more specifically on the empirical part of the research, as the theoretical part has been discussed in the introduction and literature chapter.

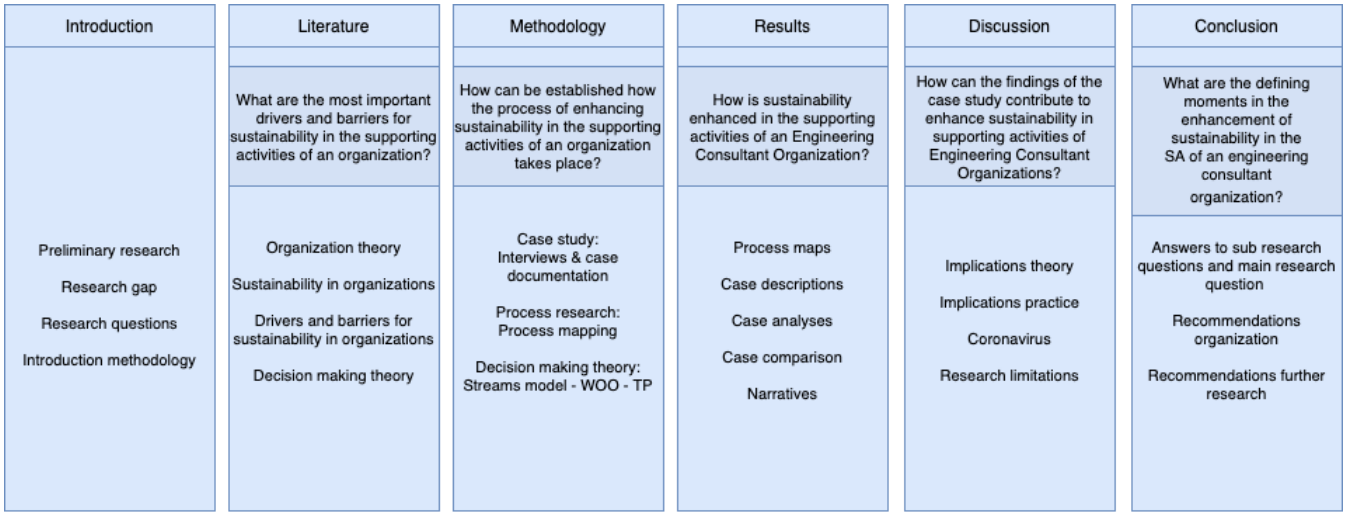


Figure 12: Overview of research.

3.1 Data collection

As opposed to the theory, empirical research is based upon hard evidence gathered through real-life experiences or observations (Kumar, 2019). The goal of the data collection is to create an understanding of the process of enhancing sustainability within one organization. The model that is used in the data collection is the process research model, which is elaborated on in the first part of this section, 3.1.1. As part of the empirical research a case study on Royal HaskoningDHV (RHDHV) is conducted, which is an engineering, design and project management consultancy within the construction industry. Further elaboration on the case study is given in part 3.1.2. Data within the case study is gathered through interviews and through collecting relevant documentation. In the last part on the data collection, section 3.1.3, the interview method will be discussed.

3.1.1 Process research

According to Van de Ven (2007) there are two basic models for designing social research in order to examine different types of questions and propositions. These two models are the variance model and process model. The variance model is focused on understanding the cause and the result, and include research questions that are outcome driven, often being 'what'-questions. Process studies are executed in order to create an understanding of the process of change and development over time in cases that are subject in the studies. The main focus of the studies is finding out 'how' and 'why' change occurred in cases (Van de Ven, 2007). The method used in this study is process research. This method had the aim to create an understanding of the process of enhancing sustainability within the SA of RHDHV.

In process studies researchers gather data in order to see how a certain process evolved over time. The gathered data consists mainly of descriptions of events that are subject in the study but could also be quantitative data. With this gathered data, a timeline can be developed, consisting of the most relevant events of the specific process that is studied. The visualization of such a series of events is called a process map. The goal of the process study is not to just create such a timeline, but to unravel which circumstances led to specific particularities in the process, leading to a narrative that explains the process (Poole, Van de Ven, Dooley, & Holmes, 2000).

Narratives explain how events got from one point to another on the timeline that depicts the process (Poole et al., 2000). Stories or narratives can be a valuable source of deeper realities of organizations, that are closely linked to experiences of members of these organizations. Through collecting stories in an organization, it can be investigated how narratives around specific events are constructed (Gabriel & Griffiths, 2004). However, Gabriel and Griffiths (2004) also argue that stories are not factual representations of events but rather enhance facts with meaning, as stories are symbolic and contain emotions. This can be seen as a strength as well as a weakness of using stories in research. The aim is to find a more general narrative and therefore multiple cases are looked at in order to compare the processes of the different cases. Weaknesses of process studies are that generally the sample size is small, but through the depth of analysis large amounts of data are common (Poole et al., 2000).

A process research plan is established for the research to be reproducible and for the different steps that yielded data to correspond. Van de Ven (2007) established a list of issues and decisions to formulating a process research plan, which is given in Table 3. One of the issues is that the meaning of process has to be established. A process can be viewed as a category of concepts of actions, such as workflows or decision-making techniques, or as a sequence of events, describing how things change over time (Van de Ven, 2007). In this study the meaning of process is a developmental sequence, describing what and how things happened over time. Another issue that has to be considered is the research strategy. There are four research strategies according to Blaikie (2007), being inductive, deductive, retroductive and abductive. The inductive research strategy has the aim to establish generalizations as explanations for certain patterns. The deductive strategy has the goal to test theories by for example eliminating incorrect theories. The retroductive strategy intends to determine the reasons behind certain observations. Abductive research has the objective to create an understanding of social life through motives and views. Van de Ven (2007) mentions the same four strategies, but relates abduction to induction, and argues that as abduction describes reasonings in more detail, he uses abduction instead of induction. In this research, the retroductive research strategy seems in place, whereby underlying mechanisms are identified, in order to explain the process.

Issue	Decision	This research
Meaning of process:	A category of concepts or developmental sequence?	Developmental event sequence
Theories of process:	Examine one or more models?	More entities, progression is constructed: dialectical
Reflexivity:	Whose viewpoint is featured?	Viewpoint of different employees of RHDHV: decision makers, executers, etc.
Mode of inquiry:	Deductive, inductive, retroductive	Retroductive
Observational methods:	Real-time or historical observations	Historical observations: already executed projects and processes are looked at
Source of change:	Age, cohort or transient sources?	Diachronic
Sample diversity:	Homogeneous or heterogeneous?	Homogeneous: cases are within one organization, interviewees within same organization. Heterogeneous: different types of internal projects or initiatives and SA
Sample size:	Number of events/cases?	Eight cases within case study organization RHDHV Multiple events per case
Process research designs:	What data analysis methods touse?	Few cases, many events.

Table 3: Issues and decisions for formulating process research plan (based on Van de Ven, 2007).

3.1.2 Case study

A case study is a qualitative research approach, creating in-depth insight of a selective sample. A case can be an organization as well as a process (Verschuren, Doorewaard, & Mellion, 2010). Case study research is used to understand more about individuals, groups or organizations, and can be done in the a broad array of sectors (Yin, 2009). In case studies the 'why' and 'how' questions are more common than 'who', 'how much' or 'what' questions (Yin, 2009). This adds up to process research where also the 'why' and 'how' questions are the best fit. The main research question for this research is a 'what' question, but with the aim to find out how processes of transition towards sustainability occurred. Therefore, it is chosen to perform a case study in combination with process research, in order to create an understanding of the processes of improving sustainability performance within one organization. The case study exists of multiple layers, being the organization that forms the main case, and several processes of enhancing sustainability forming the cases.

The case study in this research comprises the organization RHDHV and within this organization, eight different cases are looked at. The case study is a retrospective study, in which past phenomena, situations or problem are examined. Retrospective studies are usually performed by using available data or by interviews where is asked about past situations and the interviewees recollection of these (Kumar, 2019).

The mission of RHDHV is to enhance society together through their expertise, partnerships and innovations, stating: "We combine our knowledge and expertise with our clients' strengths to co-create solutions that are designed to enhance the lives of communities around the world. We experiment with new ideas and invest in new technologies with the aim to make even more impact for our clients and for society as a whole" (retrieved from website RHDHV, 2020). The CS goal of RHDHV is to be a responsible and sustainable business being integrated programs that embed, action and measure the positive role a company needs to play in society, supporting a healthy environment and prosperous

economy. Also, RHDHV committed to four of the SDG's in their SA. These four goals are quality education, decent work and economic growth, climate action and partnerships for the goals. RHDHV reports the progress regarding sustainability goals through their annual report, responsible & sustainable business (RSB) report and the CO2 performance ladder. These reports include examples of sustainable initiatives are mentioned, as well as the progress of the reduction of CO2 emissions.

The eight cases are projects and initiatives that RHDHV has executed in the past decades for improving the sustainability performance in their SA. As explained in the previous section, the cases were identified through having exploratory talks with employees of RHDHV, leading to a list of internal projects and initiatives. Further selection of the cases came about through a discussion and voting session with members of the employee council and the executive board on the possible cases, in order to identify the most important ones. This is partly done by looking at the innovativeness of the projects and initiatives, taking into consideration the 'Diffusion of innovations' model of Rogers (1983) (Figure 13). RHDHV wants to be an innovator, early adopter or early majority in adopting sustainability actions in their SA. During the discussion with the board and council this innovativeness is discussed and taken into consideration in the selection of the most relevant cases.

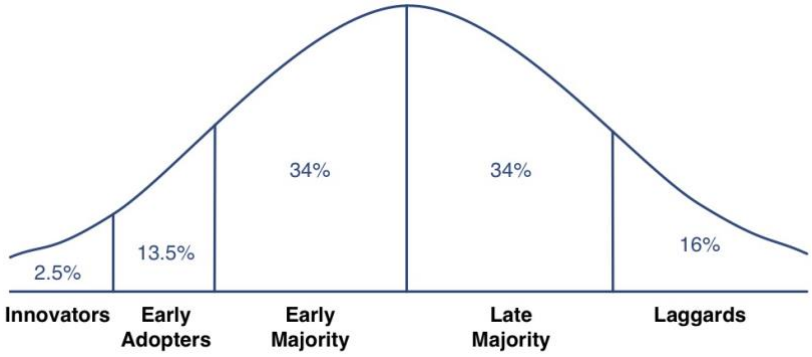


Figure 13: Model of diffusion of innovations (Rogers, 1983, p. 247).

The cases were also selected as being a representation of the SA of RHDHV. The SA of RHDHV are divided in eight categories, which are listed in the first column of Table 4. The SA can be linked to the different parts of organizations as distinguished by Mintzberg (1993) and Porter (2011). The SA and connected parts of the organizations are given in Table 4 providing an overview of the structure of the SA of the organization of RHDHV related to organization theory as explained in the literature chapter.

The first is the executive board, which could be linked to Mintzberg's (1993) strategic apex and to Porter's (2011) value chain model under the firm infrastructure. The second category of the SA is finance, which consist of treasury, financial and business control. Mintzberg (1993) classifies this as support staff and Porter (2011) as firm infrastructure. The third category is HRM, which according to Mintzberg (1993) fits the technostructure part of an organization and following Porter (2011) this is a separate category within the SA. The fourth category is communications and brand, which according to Mintzberg (1993) would fall under the category of support staff and according to Porter (2011) under firm infrastructure. Strategy and operational excellence form the fifth category of the SA, comprising strategy, mergers & acquisitions, digital engineering, QHSE and project excellence. If we compare this to the model of Mintzberg (1993) this category would fit the technostructure, and within Porter's (2011) model the technological development. The sixth category is workplace solutions (WPS), including the strategy office, assistance and management services, innovation and projects, applications, services and regional WPS. Within the model of Mintzberg (1993) this broad category would fit in the technostructure as well as the support staff. Porter (2011) would categorize this as technology development and partly as firm infrastructure. Legal affairs, insurance management and the company

secretary form the seventh category of RHDHV's SA, which comes closest to Mintzberg's (1993) support staff and to Porter's (2011) firm infrastructure. The last category is innovation and digital services, which matches the technostructure of Mintzberg (1993) and technology development of Porter (2011).

RHDHV supporting activity	Mintzberg (1993)	Porter (2011)
Executive Board	Strategic Apex	Firm Infrastructure
Finance	Support staff	Firm Infrastructure
Human Resource Management	Technostructure	Human Resource Management
Communications and Brand	Support staff	Firm Infrastructure
Strategy and Operational Excellence	Technostructure	Technology Development
Workplace Solutions	Technostructure Support staff	Technology Development Firm Infrastructure
Legal Affairs	Support staff	Firm Infrastructure
Innovation and Digital Services	Technostructure	Technology Development

Table 4: SA RHDHV linked to the theories of Mintzberg and Porter.

The selection of the cases is as follows:

1. Waste management in the offices;
2. Replacement of lease cars in electrical lease cars;
3. Office building of RHDHV in Amsterdam;
4. Mobile working facilities: communication tools and virtual work environment;
5. Location management of WPS: accessibility of office buildings with public transport and facilities for people who travel by bike;
6. The ESG investments of the pension office of RHDHV;
7. Business air travel;
8. Solar panels on the rooftop of the office building of RHDHV in Amersfoort.

The eight cases are mainly part of the SA WPS, as these comprise the parts of the organization (office buildings, FM, ICT, procurement and contract management, etc.) in which RHDHV can and wants to improve sustainability performance. For these eight cases, data is collected through interviews and case documentation.

3.1.3 Interviews

The most common way for data collection in qualitative research is through interviewing (Nigel King, 2004). The qualitative research interview has the purpose to gather information on specific research subjects from the viewpoint of the interviewee and to create an understanding of this viewpoint (Nigel King, 2004). Semi-structured interviews give interviewees the opportunity to elaborate on their viewpoint of experiences and processes (N. King & Horrocks, 2010). Interviews of this kind generally contain open questions, have a low degree of structure and have an emphasis on specific situations and sequences of action that the interviewee experienced (Nigel King, 2004).

Data collection within the case study included conducting qualitative interviews with relevant stakeholders within each of the cases. The selection for the interviewees is made during the same selection process as for the cases and included support staff like managers of parts of the SA, as well as employees representing the operating core or technostructure. Some of these stakeholders were interviewed about more than one case, as they have been involved in several of the cases. The interviews were done one-on-one, with one interviewer and one interviewee, and took one hour to one and a half hour each. The interviews were semi-structured, with open questions. The interviews were conducted in Dutch and were recorded. At the end of the interview a picture is made of the created timeline. Afterwards the recordings of the interviews were transcribed.

The goal of the interviews is on the one hand to reconstruct a timeline of the process of events, and on the other hand to understand why and how these events took place, in order to create a narrative. The timeline is created partly during the interview, through writing down events on pieces of paper and laying them in chronological order on the table. As the goal of the interview is to understand the process, and as every process might be different, beforehand it cannot be established what would be the precise content of the interview, and therefore semi-structured interviews were in place. The interview protocol with the interview questions is added in the appendix (B).

The D&B for sustainability, that are identified from literature, serve as a guideline within the interviews. The D&B form the basis for the interviews, but the focus is on the processes within the cases. This results in an interview about what happened, how it started and who was involved, in order to create a timeline and a better understanding of the process. The list of D&B is used as a checklist during the interviews, which is checked again at the end of the interview in order to verify whether no important subjects are missed. The total process of each case is mapped by identifying events through the interviews and case documentation and by forming a timeline of these events. The process maps together with the collected data forming the narrative are the starting point of the data analysis.

3.2 Data processing

The data collection within the case study resulted in recordings, transcripts and a rough timeline from the interviews and case documentation. The case documentation included reports, presentations and e-mail conversations, that are relevant for the constructing the case information. With this data the case history is set up, which is also referred to as case record or case database, in which the collected data within the case study is assembled (Yazan, 2015; Yin, 2009). The case history included the timeline of events, goal of the project or initiative, main stakeholders and case summary.

With the help of case documentation and interviews, forming other perspectives, this information was triangulated, and possible new events were added to the timeline. The timeline and case descriptions were verified with one of the interviewees during a concluding contact moment.

The case history formed the basis for mapping the processes of the projects or initiatives forming the cases. A process is a developmental sequence, describing what and how things happened over time (Van de Ven, 2007). Process mapping involves creating an understanding of the process of something and focusses on what things looks like or how things work, a form of 'descriptive' methods (Verschuren et al., 2010).

The process maps in this research included the most important events from projects or initiatives that enhanced sustainability, that followed from the interviews and case documentation. The mapping is done using four different shapes of events boxes, which are linked through arrows. Also, a timeline is added to each of the maps.

The processed data, comprising the case history, process maps and case descriptions, form the basis for the data analysis, which is explained in the subsequent section.

3.3 Data Analysis

The method of analysis of the data from the empirical research will be discussed in this section. This section will start with the decisions that were made regarding the data analysis, posed by Van de Ven (2007). The following part goes into the analysis of the processes in the cases using the streams model, one of the models for analyzing decision making processes. Adding to this, the identification of WOO and TP as part of the analysis is discussed. Section 3.3.3 concerns the method of comparison of the

cases through a cross-case analysis. In section 3.3.4 the patterns and striking observations that followed from the analysis are discussed. The process maps were analyzed to identify patterns of events. The cases were compared to be able to identify common aspects throughout the cases, regarding characteristics of the case; the streams, WOO and TP; and regarding D&B. The last part of the methodology of the data analysis describes the narratives, that were formed for two of the cases from the case study.

3.3.1 Decisions data analysis method

For the data analysis, the method of identifying issues and making decisions by Van de Ven (2007) is used. In Table 5, the decisions regarding the analysis of the data of this study are elaborated on.

Issue	**Decision**	**This research**
Process concepts	What concepts or issues will you look at?	Data collection through interviews and case documents focusing on the process of projects that enhanced sustainability within SA of RHDHV. Relations with the most important D&B from literature are expected. Also, the five parts of an organization by Mintzberg are considered as perspectives within the cases.
Incidents & events	What activities or incidents are indicators of what events?	Combination of incidents and events that make up the process of the case. Important incidents and events are decision moments, TP, circumstances such as new regulations, technologies, etc.
Specifying an incident	What is the qualitative datum?	Description in words of events making up the process of the case, retrieved through interviews and case documentation such as presentations, meeting minutes, etc.
Measuring an incident	What is a valid incident?	The events are actions within internal sustainability-projects that are important for the course of the project, these can be decision moments or TP.
Identifying events	What strategies are available to tabulate and organize field data?	First by creating timeline of events during interview, separating initial, development and execution phase. Then by transcribing the interviews, creating a case history and extracting events from the interview transcripts.
Developing process theory	How to move from surface observations to a process theory?	Analysing the events that form the processes within the cases. By comparing the different cases using the typology summary case studies. Also, by comparing the processes to DMT with models and through identifying concepts.

Table 5: Formulating the data analysis method (based on Van de Ven, 2007).

3.3.2 Streams model analysis

The first part of the analysis comprises analyzing the processes with the use of the streams model, a model for analyzing decision-making processes (Teisman, 2000). In the literature chapter, this model is introduced and explained, and the related concepts of WOO and TP were elaborated on. The different streams that are identified in the processes of the cases are the problem stream, solution stream and participant stream. The findings from the interviews and case documentation created the ability to identify the different streams. Part of this analysis is identifying WOO and TP. The literature study resulted in the definition of WOO and insight in what WOO can include. As the WOO often enables streams to be coupled (Birkmann et al., 2010), the WOO are identified by understanding the different streams and their flow in the processes. With the use of the characteristics of TP (Milkoreit et al., 2018), it is tried to identify the TP in the processes.

3.3.3 Cross case analysis method

The case comparison method involves a cross case synthesis to compare the findings from the cases. In this research is looked at eight cases, which is classified as few cases, with each case containing roughly between five and fifteen important events which is somewhere between few and many events. The typology of the process research designs from Poole et al. (as cited in Van de Ven, 2007) that would therefore fit this research is the summary case studies. Summary case studies is a comparative analysis

of qualitative case studies making use of the techniques of Yin (Van de Ven, 2007). These five analytic techniques are pattern matching, explanation building, time-series analysis, program logic models, and cross-case synthesis. Within these techniques, for this research is chosen for cross case synthesis, because through comparing the cases, patterns and other observations could be recognized. Cross case synthesis can be used in multiple situations and can have different designs in each situation (Yin, 2009).

	Few events	**Many event**
Few cases	Summary case studies	Summary case studies
		Phasic case studies
		Time series analysis
		Markov analysis
Many cases	Multivariate analysis	Multivariate analysis of summary data
	Phasic analysis with optimal matching	Phasic analysis with optimal matching
	Event history analysis	Markov analysis
		Time series analysis

Table 6: Typology of process research designs (based on Van de Ven, 2007, p. 213).

For the comparison of the cases within this study, a word table is created, enabling the comparison of the cases along different subjects. This table includes for each case the goal of the project or initiative, the different streams, the WOO and the time period. This table creates an overview of the findings in summary, which makes it easier to compare and draw conclusions.

Apart from the table, patterns are identified, and observations are made regarding the different streams, being the problem, solution and participant stream. Similarities and differences are looked for, as well as other general or interesting conclusions that can be drawn when overlooking the streams per case. Furthermore, the identified WOO and TP are compared, leading to insight in the similarities and differences, wherefrom conclusions can be drawn.

Next, patterns and observations regarding the found D&B are identified by creating different tables. First, the drivers are elaborated on, describing the implications of each of the drivers in the cases. Second, the occurrence of the drivers in the cases is visualized in another table. The same is done for the barriers. These steps create the insight in what D&B occur most often and what cases contain the most D&B.

The last part of the comparison of the cases involves the most important patterns and observations over all the cases. For this, another table is created, reviewing the occurrence of the most striking observations per case. This table is depicted at the end of section 4.3.4 (Table 12).

3.3.4 Patterns and striking observations

Different patterns and striking aspects are identified through comparing the cases. In this section the patterns and striking observations are elaborated on, in order to understand how they are identified and to clarify the difference between the concepts.

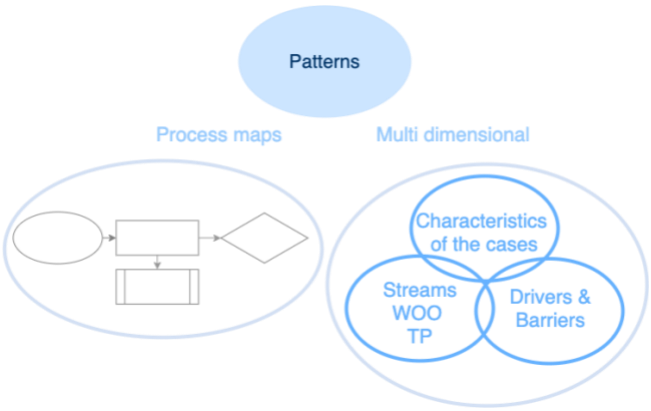


Figure 14: Schematic representation of patterns.

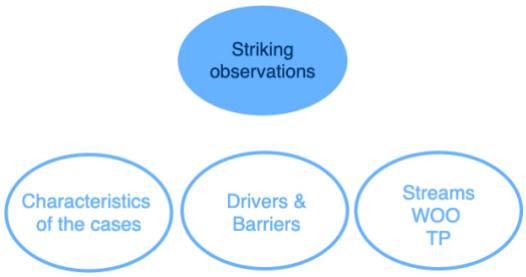


Figure 15: Schematic representation of striking observations.

Two different types of patterns are distinguished in this study, namely patterns of events, and multidimensional patterns (Figure 15). Patterns can be combinations or sequences of events that occur more than once in the process maps. Patterns can also be multi-dimensional, being a combination of the characteristics of the case, streams, WOO, TP and D&B.

Patterns – Process maps

Data analysis involves processing the collected data such that the data set is broken up into pieces, rearranged and compared in order to make it possible to draw conclusions from the data (Westbrook, 1994). This processing makes it possible to distinguish the important aspects and to extract patterns from the data (Westbrook, 1994). Analyzing data from process research requires events to be categorized and conceptualized, in order to find patterns within the sequence of events (Langley, 1999). Langley (1999) elaborates on patterns by stating that patterns exist in many different forms, but that the most frequent occurring pattern is the "linear sequence of phases that occur over time to produce a given result" (Langley, 1999, p. 692). In this research, events within the process of enhancing sustainability are focused on. Therefore, in relation to the process maps, the patterns that are searched for are sequences of events.

As this research uses the process research approach, the patterns are also looked at in the light of the process research theory. Van de Ven (2007) uses the terms sequence of events and patterns of events interchangeably to explain this concept. In process research the focus lies on the understanding of how change has occurred. Therefore, he elaborates on the use of patterns within processes of change as something that needs to be identified before the causes or results of patterns can be elaborated on (Van de Ven, 2007). Langley (1999) adds to this that understanding the patterns, in terms of the sequence and ordering of the events and their interaction, is therefore relevant for developing the process theory.

In the fourth chapter (section 4.3.1), the patterns within the process maps are given. These patterns of events are reoccurring sequences or orderings of events that are identified through analyzing the process maps.

Patterns - Multidimensional patterns

Multidimensional patterns in the context of process research as executed in this study is not common in literature. In relation to environmental engineering, Kutz (2018) elaborates on multidimensional patterns regarding change within the earth system. Multidimensional patterns can exist in such a change, but are difficult to understand or predict (Kutz, 2018). Laftchiev and Liu (2018) researched finding multidimensional patterns in multidimensional time series and elaborate on the need for searching for multidimensional patterns. Multidimensional patterns according to them are several patterns within one timeframe and across multiple time series. They believe that single patterns can occur more than once in one time series, but that by looking into multiple patterns in multiple time series abnormalities can be identified more easily.

In this research, apart from the patterns of events, patterns can also be multi-dimensional. The different dimensions in these patterns are the characteristics of the case, streams, WOO, TP and D&B. The striking observations are also based on the analysis of the data through these dimensions. Therefore, it is chosen to only focus on the patterns of events and striking observations.

Striking observations

Langley (1999) describes in relation to process research that some aspects of the cases or made observations cannot be defined as patterns. However, if these aspects or observations are important for the process of the cases, these should be mentioned separately (Langley, 1999)

The striking observations are made on the basis of the characteristics of the cases, including goals or strategy; the involved parties; and the internal and external circumstances and events that took place during the process. These observations are also made through the analysis and comparison of the streams, WOO, TP and the D&B. Figure 15 depicts the different parts of the analysis where the striking observations follow from.

3.3.5 Narratives of the cases

The last part of the data analysis focuses on two of the eight cases, resulting in the explanation and narrative of the processes within the enhancement of sustainability within RHDHV. Narratives have a relation with process theory, as some scholars refer to process theory as narrative explanations (Grin, Rotmans, & Schot, 2010). Process research is focused generally on how change occurred, and this explanation of how this happened can be best narrated through a story of the sequence of events that together formed the process (Van de Ven, 2007). The narrative has the aim to understand the causes and the consequences of the events (Van de Ven, 2007).

Complex situations, involving series of events and interactions between stakeholders, can be understood through narratives (Grin et al., 2010). Narratives are not factual (Gabriel & Griffiths, 2004), but are the personal interpretations of the processes. Methods to create and structure a narrative are very broad and can include storytelling, describing the relations between events and actors and describing causal relations (Grin et al., 2010).

The narratives are formed by the interpretation of the events and other collected data with the process maps as a starting point. This has the goal to create a deeper understanding of the processes in the organization of the case study. The choice is made to focus on only two of the cases, as these are a representation of all the cases and form the needed understanding of the processes. The choice of the two cases is based on the representation of the different striking observations that are made. One case is chosen because it involves many striking observations and many barriers in the process. In the other case there was a clear goal; fewer striking observations were involved; and the outcome was successful. The narratives are created by using the collected data from the case study as a basis.

4. Results and Analysis

The third research sub-question, which is the focus in this chapter, is: *How is sustainability enhanced in the supporting activities of an Engineering Consultant Organization?* In this chapter the results from the case study within the organization of RHDHV are described. The case study consists of eight different cases, comprising initiatives and projects with the goal to enhance sustainability in the SA of RHDHV. As part of the case study, interviews were conducted, during which the processes of enhancing sustainability were mapped.

The process maps of each of the cases are depicted in appendix C and the descriptions of each of the processes are described in section 4.1. In section 4.2 the analysis of the cases is described, in which the streams from the streams model of Kingdon (2013), WOO, possible TP and D&B are identified. In section 4.3 a comparison is made between the eight cases, through which patterns are identified and the most striking observations are mentioned. In the last part of this chapter, section 4.4, the narratives of two cases are described to create a better understanding of the patterns and observations.

This chapter starts with the description of some context of the organization of RHDHV, that is relevant to the case study. RHDHV is an independent international engineering and project management consultancy organization, stating to be leading the way in sustainable development and innovation. RHDHV has approximately 6000 employees spread over offices in 30 countries. The fields of expertise include aviation, buildings, energy, industry, infrastructure, maritime, mining, transport, water, urban and rural development. The focus of this study is on the SA of the organization, which are depicted in Figure 16. The cases, except for the pension office, are all within the responsibility of the SA WPS. The pension office is a separate organization but is linked to RHDHV.

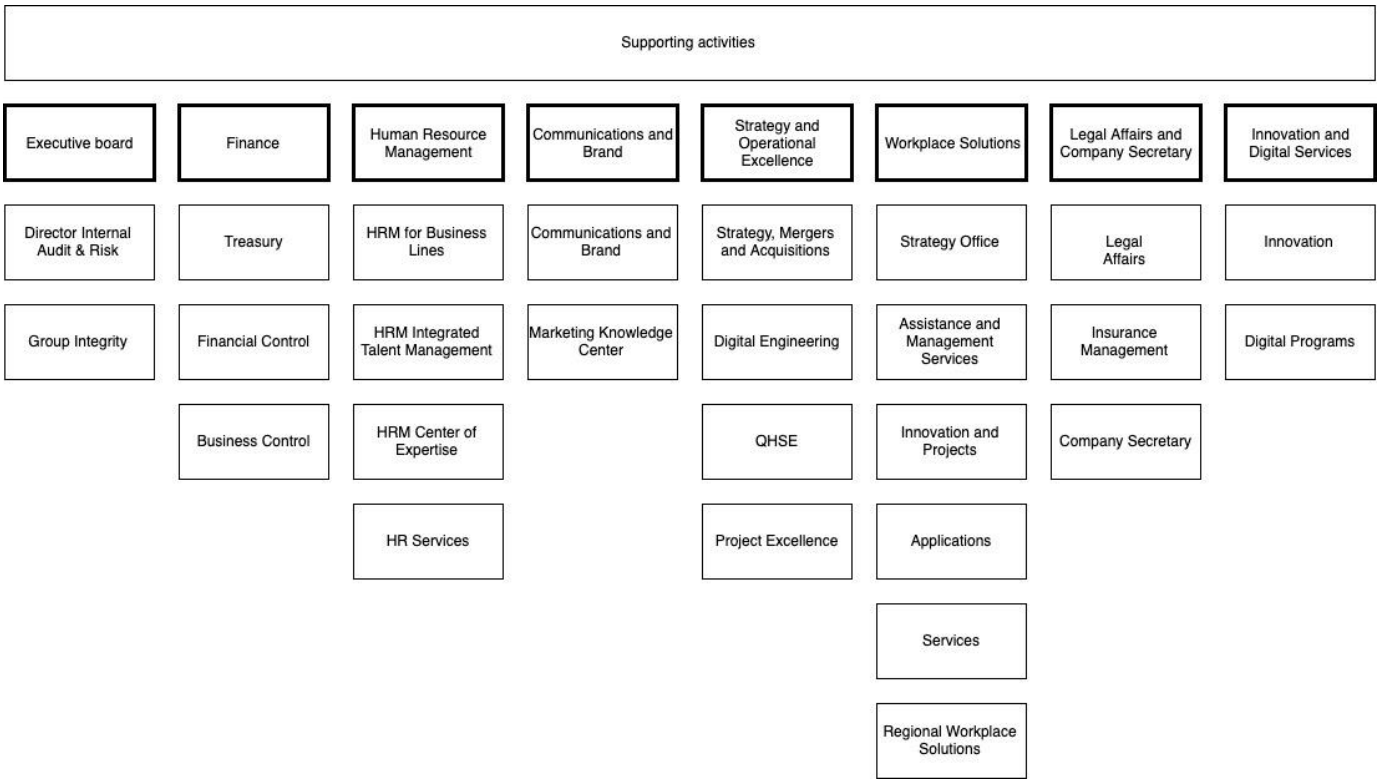


Figure 16: Organization chart of SA RHDHV.

RHDHV started to exist in 2012 by the merge of Royal Haskoning and DHV. When Royal Haskoning and DHV merged, the director corporate responsibility from DHV, who was responsible for the integration of sustainability within the organization, hold the function for the whole of RHDHV. At the end of 2015, the responsibility for sustainability went from one department with abovementioned director, to a responsible employee or group of employees in every business line and corporate group.

Within the Netherlands RHDHV has twelve offices, with the office in Amersfoort as global headquarters. In 2014 the offices in The Hague and Nijmegen were moved into, which were big projects for the services team of WPS. In 2017 the office in Amsterdam moved, which forms one of the cases in this study.

ProRail started the CO2 performance ladder in 2009, with the goal to reduce their CO2 emissions and to stimulate others to do the same ("Prorail draagt succesvolle CO2 prestatieladder over," 2011). This was done by evaluating suppliers and partners on their sustainability performance through the CO2 performance ladder within tender processes. The performance ladder obligates organizations to know their own CO2 emissions, to take steps to reduce the emissions, to communicate about the emissions and to take steps to reduce emissions within the sector. Many organizations committed to the CO2 performance ladder by requiring a minimum level of performance for participating in a tender. Since 2011 the ladder has been owned and managed by SKAO. RHDHV has committed to the ladder since the merge, among other things by setting reduction goals and publishing a yearly CO2 performance ladder report (Zuidema, 2020).

4.1 Case descriptions

The processes within the cases are described in this section. In appendix C the process maps are depicted. Each case description concludes with key events that are the takeaway for the subsequent chapter, in which the case processes are analyzed.

4.1.1 Waste management

The case of waste management within the offices of RHDHV is an ongoing process, fitting within the procurement and FM department, which is part of RHDHV's SA WPS. The process map (C1. Waste management) of this case covers the period between 2013 and 2020. At the end of 2013 the Green Deal Circular Procurement (GDCI) was formed, as a part of the Green Deal (GD) initiative that started in 2011, by different parts of the government together with private organizations. RHDHV was involved since the start of the GDCI, by signing the pledge and therefore agreeing to start with at least two circular procurement trajectories in 2014. The initial contact with the GDCI was through the sustainability director at that time and the head of the procurement and FM department was involved with signing this pledge. Two of the trajectories were the waste separation bins and management of the incoming and outgoing waste streams.

For the new offices in the Hague and Nijmegen waste bins had to be bought. Waste bins with separate compartments, called Split-3 bins from Lune, were bought and this marked the start of the pilot project for waste separation. In 2015 the Split-3 waste bins were replaced by the Split-4 and were implemented in 4 offices, and in 2016 and 2017 the bins were placed in all the offices. Not all building owners were willing to collaborate with the separation of waste from the start, but after some time all owners collaborated with the separation of waste. In 2017 the whole stream of waste separation and recycling was realized, by placing large waste separation containers in all offices.

The paper cups were collected separately in the Split-3 and Split-4 bins, however these could not be recycled, as the cups contained too much ink. Research was conducted with JDE and waste manager Renewi, which led to a pilot-project with cups containing less ink and the cups being recycled to sanitary paper. Since 2018, all the cups were recycled to sanitary paper, and in 2019 was started with recycling the sanitary paper to toilet paper.

In 2014 and 2015 consultants of RHDHV were asked for advice for the internal waste management, which led to creating an overview of the incoming and outgoing streams. After this assessment, suppliers were involved to collaborate on reducing the incoming waste and managing the outgoing streams. Some suppliers were not willing or able to collaborate, which led to the replacement of some of these suppliers. Since, the contracts with suppliers included the related management of waste.

The key event of this case, marking the start of multiple initiatives within the waste management regarding the GDCI, is the purchase of the separation waste bins, when the offices of Nijmegen and The Hague moved.

4.1.2 Electrical lease cars

The lease cars of RHDHV are currently in the process of being replaced by 100% electrical cars, instead of fossil fuel cars. This process (depicted C2. Electrical lease cars) started in 2015 with a set goal by the CEO of RHDHV. A pilot project was set up, for which participants were searched. The project commenced which a group of 28 employees, who started driving electrical lease cars for a period of one year, amongst this group was a part of the management team. The pilot received media attention, as RHDHV was one of the first to start with electrical lease cars. After the pilot project turned out to be successful, due to positive feedback from the participants and decreasing CO2 emissions, the policy for lease cars was changed at the end of 2017, stating that all lease cars had to be fully electrical by the end of 2021. Not all employees had positive attitudes towards switching to an electrical lease car, for these employees there was the possibility to use a fossil fuel car from the pool of cars with unfinished lease contracts. To be able to make electric driving possible, charging points had to be installed, at the offices

of RHDHV as well as at people's homes. There were some difficulties with the charging stations at the offices, as the capacity of power is insufficient for many cars to charge. Adding to this, the number of charging points at several points in time did not meet the number of electrical cars, leading to a shortage of capacity for charging. Additional taxes for electrical cars have been low in comparison to fossil fuel cars, however, at the end of 2019 the Dutch government increased the additional tax for electrical cars.

The key events and takeaways of this case are the CEO of RHDHV initiating the idea of electrical lease cars, the high CO2 emissions caused by mobility and the technological innovations of the past few years regarding the electrical cars and charging points.

4.1.3 Office Amsterdam

The case of the office in Amsterdam can be seen as a project (C3. Office Amsterdam). The start of the project was in 2014 and the end of the project was when the office building was completed.

At the end of 2014 the external party 'Kantoor Vol Energie' (KVE) came into contact with RHDHV, through the sustainability director at that time, for possible collaborations with projects from the business lines. In 2017 the contract of the office building in Amsterdam Duivendrecht would come to an end. Together with KVE ambitions for a new office building were defined. A tender was set out to search for a partner to find an office building conform the ambitions, which led to the selection of Wijngaarde, in cooperation with BAM. Together with external party Wijngaarde a new office building was searched. 23 buildings in total were considered, resulting in a shortlist of two buildings, a church and a garage. These buildings were presented to the board and Employee Council, after which a third office building was added. These buildings were visited, after which a choice had to be made. The choice turned out to be difficult to make by the board, as the office was so unusual, so a group of representatives of the employees of RHDHV were presented the options and made the decision. The garage building was chosen, and together with KVE, BAM and the team of business line I&B of RHDHV, designs were made.

The board of RHDHV, as well as the owner of the building, were not willing to invest in the construction works. Also, the initial agreement with the offices/services team of RHDHV was to search for a new building, not costing more than the amount that the current office building did per month. Amsterdams Klimaat & Energiefonds (AKEF) is a fund that invests in sustainable projects within Amsterdam and was willing to invest in this project. AKEF's main funder is the municipality of Amsterdam, wanting to invest the returns of sold Nuon-shares in sustainable projects. AKEF was involved in the project after the question for the project financing was asked to the Contact foundation, comprising all future renters of the building including RHDHV, and did not result in a solution. AKEF was involved through the Contact foundation and was willing to invest in the building under specific conditions.

In 2016 and the first half of 2017 the construction works took place, with BAM as the main partner, being delayed by the fact that everything in the office was unusual, so it needed a lot of extra design and amendment work. Also, the development plan for the building from the municipality of Amsterdam was difficult to meet, as this has specific requirements, which caused delay. The office building was ultimately finished in May 2017, with its official opening in June.

The key events and takeaways of this case are the motivation from the Services team to create an energy neutral office building, the outdated office in Amsterdam Duivendrecht, the external party KVE in search of a collaboration and the external party AKEF funding the project.

4.1.4 Location management

The location management is a part of the WPS more specifically this belongs to the services department within WPS. Apart from the services team, the location management is also managed through interaction with the business lines and employees. This is sometimes managed per location, and sometimes for the whole organization at once. Location management comprises the strategic location

of the office buildings of RHDHV and a part of the facilities within the offices. In this case (C4. Location management) the location of the offices in regard to public transport accessibility and facilities for sustainable modes of transport are looked at.

In order to motivate people to take public transport or the bike as their mode of transport to work, there are policies from HRM. Apart from these policies, by locating offices at convenient public transport locations, an extra incentive is created by providing services for bikers, such as showers, lockers and parking possibilities.

Before 2012, Royal Haskoning as well as DHV set goals for reducing the CO2 emissions caused by commuting, respectively a 5% and 2% reduction. Since the merge, the goal of RHDHV was to reduce the CO2 emissions caused by offices by 4% and for business travel also by 4%. Goals were also set in 2012 by planning to stimulating the use of public transport and bike, and for reducing the total commuted distance by car by creating a parking policy. In 2013 the CO2 performance ladder included CO2 reduction plans regarding the location management, being more public transport and a pilot project with E-bikes.

The new approach for offices, which was created around the project of the new office in Amsterdam, in 2015 and 2016, puts the employee and client central. Before, there were certain criteria for offices, such as some for sustainability performance, public transport and costs. Since the new office in Amsterdam, the main interest for new offices was the integration of putting the employee central and the criteria, involving a compromise between sustainability, looks, feeling, location, accessibility, clients and parking.

The key takeaway of this case is that the goals for CO2 emissions reduction include the mobility of employees, in which the location management of the offices play a big role.

4.1.5 Mobile working facilities

This case cannot be seen as a single project or program within the organization of RHDHV, rather this is an ongoing process of innovations and improvements. The timeline of the process map (C5. Mobile working facilities) starts in 1990, but the focus of this process map is on the period between 2000 and 2020. Mobile working facilities are relevant in the light of sustainability as due to good facilities it becomes possible for employees to work remotely and for meetings with clients to be held online resulting in people travelling less for work. In the CO2 performance report some attention has gone to the role of the mobile working facilities reducing the CO2 emissions of RHDHV. The CO2 performance ladder report of 2012 included a part on video conference facilities, stating that the need for this has increased due to the merge, which led to the plans in the years after to invest in video conference hardware, improve software and other tools that make working remotely and tele- and video-conferencing possible.

RHDHV has been improving its ICT facilities, such as implementing software such as Skype for Business in 2012 and a Cloud-service, through which documents and software can be accessed independently of the location one is in. In 2013 the hardware and software for conference calls was improved, leading to better possibilities for remote meetings. Related to this, employees and clients had to learn about ethics and rules for conference calls, which gradually happened.

The iRooms, or integration rooms, are rooms within the offices of RHDHV where collaboration, between the offices of RHDHV within the Netherlands but also globally, is made possible without travelling between the offices. They have been initiated in 2008, were updated in 2014 and in 2020 they were outdated so needed to be replaced. Research for new possibilities followed, which was done by interviews with the users of the iRooms and forming a business case. With a lot of possibilities of file servers, online communication and collaboration tools, a new problem arose in the past few years. People are unsure on what computer program to use for what purpose, which led to the introduction of Microsoft Teams in 2020, a program where different tools are combined into one interface.

The continuous technological innovations regarding mobile working facilities in the past decades made it possible to work remotely. This, in combination with the growing awareness of the negative impact of travel and the culture change in the Netherlands towards 'flex' working, form the most important takeaways of this case.

4.1.6 Pension fund RHDHV

The case of the pension fund of RHDHV is an ongoing process of change. The period that is covered in the process map (C6. Pension fund RHDHV) is between 2007 and now, 2020. The pension fund of RHDHV is a company pension fund, that is responsible for the pensions of the employees and former employees of RHDHV.

In 2007 there was a Zembla episode broadcasted, showing that there were Dutch pension funds, amongst others ABP and PGGM, who were investing weapon companies producing cluster munition and land mines. Due to this research journalism of Zembla, it was revealed that certain pension funds invested in the weapon industry, but also that they invested in organizations that harmed the environment and that made products using child labor. This changed the public opinion on pension funds, and more focus came on the social aspect of sustainability. Before 2007 there has been attention for sustainability in the investments for the pension fund, but it was not as important as since 2007. In 2008 a European treaty was created on prohibition of cluster munition and in 2011 this treaty went into force. In 2012 a law was formed in the Netherlands prohibiting the investments in cluster munition, which went into force in 2013.

The shift in public opinion resulted in the RHDHV pension fund deciding that from 2012 'really wrong' things that could result in bad publicity would no longer be invested in. The fund decided at the same time that all funds they were investing in had to sign the UNPRI, which are the principles for responsible investment. In 2014 a new approach for investments of the pension fund was formed, comprising three steps through which the investments became more ESG-focused. The first step was excluding investments in wrong things, such as in oil and gas companies or in tobacco. In 2016 and 2017 more questions came from employees of RHDHV about sustainability of investments, resulting in a new policy called 'Verantwoord beleggen', in which the policy for investments was stipulated. Around the same time, in 2017, laws were modified, resulting in more rules for pension funds regarding ESG. The second step, that started in 2018 was a shift in focus, on ESG rather than on the return of the investments. The return on the sustainable investments was approximately similar to the return on the previous investments. Third was to invest in projects and funds that were actively doing sustainable projects, also called impact investing, for example projects in renewable energy.

The most important event in this case is the episode of Zembla revealing the wrongful investments of pension funds, which negatively impacted the reputation of pension funds and shifted the public opinion regarding ESG investments.

4.1.7 Business flights

The process map (C7. Business flights) of this case on the flights that are made within RHDHV, covers the period between 2012 and 2020. It is an ongoing process rather than a project. In 2014 the two separate travel agencies originating from Royal Haskoning and DHV merged. Sustainability has played some role within the business flights in the period after the merge, but there was no active sustainability flight policy.

In 2015 the coalition 'Anders Reizen', or Dutch Sustainability and Mobility Pledge, started, consisting of 16 organizations pledging to make changes in their mobility policy for sustainability. RHDHV was one of the 16 organizations that were at the start of the pledge. In the period between 2015 and 2018, employees of RHDHV more often came with questions about CO2 compensation on flights. In 2017 the 'Anders Reizen' coalition started the spin-off 'Anders Vliegen', which focused solely on flights in businesses. In 2018 the board of RHDHV requested several people within the organization that were involved with the flights, to research the flight policy regarding sustainability. This resulted in

the forming of a non-official project team in the middle of 2019 that researched and formulated the new policy.

At the end of 2019 the 'Anders Vliegen' coalition created 15 best-practices of which the members of the coalition had to implement at least 7. The project team of RHDHV made an assessment of the 15 rules, whether they already committed itself to them, and how more could be met by including these in the flight policy. Most of the 15 were already implemented and some were put on the list of possible improvements. Apart from the best-practices, the team looked at compensation of the CO2 emissions through an internal CO2 tax that would be added to booked flights, and the reserved amount of money would be invested in projects regarding sustainable flying.

At the end of 2019 and beginning of 2020 there was contact with AMEX, the booking agent, who was asked to add the CO2 compensation to the online booking tool for flights. AMEX was not able to make and deliver this addition to the tool. The team hereafter decided to look for other options for the CO2 compensation. In 2020 the proposals for the CO2 compensation and for the improvements through the list of best practices were created and prepared to present to the board of RHDHV.

The key takeaways of this case are the insight in the CO2 emissions of RHDHV caused by air travel, the start of the 'Anders Vliegen' coalition and the commitment to the 15 best-practices from this coalition.

4.1.8 Solar panels office Amersfoort

The case of solar panels on the roof of the Amersfoort office covers halfway 2017 until 2019, but the focus is on the year 2018 (C8. Solar panels office Amersfoort). The goal of RHDHV was to improve the performances regarding sustainability of the office buildings, in terms of decreasing the CO2 emissions. The goal for the offices for 2017, that was established in 2012, was to reduce the energy usage and to increase renewable energy. There was also the ambition to have an energy neutral office. The office in Amsterdam was finished and opened in 2017 and was an energy neutral office. Other offices still had to be improved, and one of these offices was Amersfoort.

It was already known before 2018 that the construction of the office was not strong enough to put solar panels on the roof. To get insight in other options for lowering the CO2 emissions, the tool Fastlane, which is one of the services of RHDHV, was applied. The application of the tool was initiated by the WPS services team. This tool was applied in the beginning of 2018, resulting in a list of possible solutions, of which none had a payback period of less than 10 years.

The team of WPS wanted to have more options than the given options by the Fastlane tool, so a specialist of Business Line Industry & Buildings was involved. He came with a solution using solar foil on the roof, instead of solar panels. This option was researched, and a business case was created, were several offers gave the insight that the payback period was at least 25 years. The investments costs were high, and the payback period was longer than the intended contract duration of the office building in Amersfoort. The lease contract was still planned to last 5 more years at that point, after which RHDHV wanted to have the flexibility to move to another office if desired. Therefore, the owner of the office building was involved. The owner however was not willing to invest in solar foil, unless RHDHV wanted to extend the lease contract, which RHDHV was not willing.

The most important events and takeaways within this case are the goal to reduce the CO2 emissions of the office building in Amersfoort, the internal knowledge within RHDHV that was used and the high costs of the solar foil.

4.2 Case interpretations

In this part of the results chapter the analysis of the collected data on the cases is described. Every case is analyzed using the streams model from DMT. For every case the streams from the multiple streams model of Kingdon (2013) are described, being the problem, solution or policy and participant stream. Furthermore, two concepts within DMT, the WOO and the TP, are identified and described in this section. The D&B for sustainability in organizations that are been identified through the literature review formed the framework for the subjects that were discussed during the interviews. In the data analysis, the relevance of these D&B is analyzed and described.

4.2.1 Waste management

RHDHV, as an environmental consultant, wanted to improve sustainability practices within their own organization and 'practice what you preach'. There was already some attention and policy for sustainability within RHDHV before 2013, but through committing to GD the priority became higher. The start of the GD can be seen as a WOO, because through committing to the GD more attention and priority went to circularity and sustainability of the procurement and FM within RHDHV. The GDCI marked the start of the different initiatives within RHDHV regarding making the waste management circular. The GDCI obliged their members to start with multiple circular trajectories, which RHDHV did by waste separation and by assessing the waste streams. In the years that followed, different actions have been taken in attempt to close the loop of incoming goods and outgoing waste streams.

Problem stream – A problem stream within this case is the waste streams in the offices not being separated and therefore not circular. Above that, the flex concept within offices became more popular, meaning that no one has their own fixed desk with their own bin, so less but bigger bins were desired.
Solution stream – The solution stream includes the development of the Split-3 waste bins by Lune and the investment for and implementation of these bins within the office buildings in The Hague and Nijmegen. Initially, this solution was seen as having a reduction in costs, as it would be less time consuming for the cleaning personnel to have one collecting bin versus many smaller bins.
Participant stream – The participant stream includes supplier Lune, the procurement and FM team of RHDHV and the board of RHDHV.
WOO – The streams were coupled by the team for procurement and FM. The new office buildings of RHDHV in The Hague and Nijmegen can be interpreted as a WOO for waste separation.

TP – The process of gradually changing all parts of the waste streams within the offices of RHDHV seems to be linear, where no big TP took place. Some points were important for the course of the process, of which the previously mentioned problem and solution streams are examples, but other than that this process seems logical and linear with gradual implementation of circular waste management.

Drivers – One of the main drivers that played a role in the initiation phase of this project was the government, as the government together with some companies started the GDCI coalition, that marks the start of sustainability initiatives within the waste management of RHDHV. The GDCI has been a driver that initiated the changes within the procurement and FM of the offices of RHDHV. Intrinsic motivation is a driver within this case that made this process more coherent, as due to the initiative from some individuals within the services and FM team, it has been tried to complete the total circle of circular waste management. The waste management has since been integrated in the contracts with suppliers. During the process, the support of the board was of crucial importance, as they had the decision power whether or not investments would be made for the sustainable options for the waste stream.
Already present knowledge from consultants of RHDHV was made use of, by asking for advice regarding the waste management in the offices, this was a driver in the project, which created insight for new improvements.
Barriers – Barriers within this case were the lack of support from employees and from partners, as a part of the employees was resistant to the plans to replace the smaller waste bins by larger collecting

bins. Adding to this, Van Gansewinkel (now Renewi) detected in a sample of the waste stream, that the stream was not clean, meaning that people were not separating their waste appropriately, which could be s sign of a lack of awareness or unwillingness to cooperate. The barrier was overcome by informing and trying to look for solutions together with employees. Partners were not always willing or able to cooperate according to the plans of RHDHV, this barrier was however overcome by not prolonging some of these contracts and replacing the suppliers. Barrier lack of clear strategic goal?

4.2.2 Electrical lease cars

The case of the electrical lease cars can be considered as a project. The start of the project on electrical lease cars was marked by the following streams being coupled:
Problem stream – One of the problem streams is that the CO2 emissions of RHDHV are partly caused by the employees commuting using fossil fuel cars.
Solution stream – The solution stream was to start using modes of transport that were less polluting. The CEO of RHDHV expressed the wish to have a 100% electrical lease car fleet, and through collaboration with BMW it was possible to start with a pilot project with electrical cars.
Participant stream – The participant stream consists of the board of RHDHV, the Fleetmanager and BMW.
WOO – Here the WOO was the insight in status of the CO2 emissions; an increase instead of a decrease of the emissions from mobility. This led to more awareness within RHDHV, which led to more attention and priority to the causes of the emissions.

During the course of the project, different problems occurred, being explained in the following two sets of streams.
Problem stream – A problem that occurred during the execution of the project was that the capacity of electricity and number of charging points at office buildings was too little. The continuous adjustments in the software and upgrading the number of charging points is time consuming.
Solution stream – The solution stream here is formed by the development of new charging points, software options for sharing charging points and spreading the available power amongst the cars.
Participant stream – The participants were Eneco and the fleetmanager.
WOO – The WOO here is the problem becoming pressing. The capacity problem becomes pressing every so many months, when the number of cars has grown to a point when sharing charging points is no longer possible. An increase in the number of cars happens gradually, as the pool of fossil fuel cars with unfinished lease contract is slowly being replaced by electrical cars. Through contact with Eneco the insight in the availability of new software tools was created.

Problem stream – Some employees were not willing to drive electric cars, due to the small range of the cars, the lack of pulling power, and the space in the car for luggage or extra people.
Solution stream – The solution stream comprised the short-term solution, being the pool of fossil fuel cars with unfinished lease contract, so those employees could get car from the pool. The long-term solution were the innovations and improved technology during the last few years, including bigger ranges, more power and space in the car.
Participant stream – The participant stream here were the employees and Fleetmanager of RHDHV.
WOO – The technical solutions and innovations becoming available formed the window to create an incentive for more people to switch to electrical cars.

TP – Within the case of the electrical lease cars the tipping was when the policy for the lease cars was implemented, after the pilot project was successful. After this, the number of electrical lease cars grew fast, and has been growing gradually since. However, looking at the characteristics of TP, feedbacks cannot be identified, and it can be argued whether the policy is irreversible. Therefore, no convincing TP has taken place within the process.

Drivers – The main driver to commence the project was management support, as the CEO had the motivation to decrease the CO2 emissions of mobility by turning the lease fleet electric. Raised awareness on the CO2 emissions also played a role and reputation was a driver as there was a lot of media attention for this project.
Barriers – Barriers that played a role within this project and that were overcome, were related to technology, the lack of support and negative attitudes from employees and the increased additional taxes by the government.

4.2.3 Office Amsterdam

The finished moving projects of the offices in The Hague and Nijmegen 2014, there was more time at hands to pick up a new project. The responsibility for this project was the team of services; the team within WPS that is responsible for the office buildings. KVE came in contact with the sustainability director of RHDHV at that time for possible collaborations with projects from the business lines. Adding to this, in 2017 the contract of the office building in Amsterdam Duivendrecht would come to an end, and the office building was not meeting the needs anymore, so a prolongation of the contract was not an obvious step. Therefore, considerations were made about a new office building for office Amsterdam. Adding to this, the showcase office, which is the office used as benchmark, was outdated. Therefore, another office was to be pointed out as showcase office.
The goals for CO2 reduction between 2012 and 2017 included reduction of emissions of the offices, through energy saving and improving the sustainability. The ambition of RHDHV was to have an energy neutral office, which would be as circular as possible, with re-used furniture and good public transport accessibility. This goal of RHDHV was partly because this could create business, through serving as an example for other organizations for which RHDHV could give advice, and partly because of the 'practice what you preach' goal.

Within these circumstances and events, the following problem stream can be distinguished:
Problem stream – RHDHV had the goal to reduce CO2 emissions of office buildings, but the reduction rates of CO2 emissions were still not at the desired point in 2015.
Solution stream – The solution stream regarding this problem was to create an energy neutral, or very energy efficient, office for RHDHV, which was a goal that was formed prior to this project.
Participant stream – The participant stream involved KVE and the Services team of WPS.
WOO – The streams were coupled due to different events and circumstances, as explained above, coming together, which together formed the WOO for the new office building in Amsterdam to be taken on as a big project. It can also be seen as the office in Amsterdam being the WOO for different plans that were on the shelf waiting to be executed; the CO2 reduction through an energy neutral office and a new showcase office. The window here could have been that a new office was needed, so this chance was taken to integrate these plans in the project of the Amsterdam office.

Problem stream – Another problem stream within the case of the office in Amsterdam was that after the choice was made for the garage building, an investment for rebuilding the office was needed, however the owner of the garage building as well as the board of RHDHV and BAM were not willing to invest. The services team of WPS and board of RHDHV made the agreement at the beginning of this process that the operating costs of the new office building would be the same as the current costs of the Duivendrecht office.
Solution stream – The solution stream comprised the AKEF, which is a fund that invests in sustainable projects within Amsterdam and was willing to invest in this project. AKEF's main funder is the municipality of Amsterdam, wanting to invest the returns of sold Nuon-shares in sustainable projects, so AKEF was in search of projects such as the sustainable repurposing of the garage building.
Participant stream – The participant stream here included the services team of WPS, the board of AKEF and the board of the Contact foundation.

WOO – The streams were coupled due to the Contact foundation being actively in search of investment possibilities. The window for the office in Amsterdam was AKEF being involved in the project. If they would have not been involved and no other investment-party was available, the plans might have changed or even cancelled.

TP – There was no real TP within the process of this case, when comparing the characteristics of a TP to the process of this case. The decision for the garage building was an important point within the case, because a risk was taken to choose for a non-standard office building, without the funding being sorted yet. The formation of the ambitions for the office was also an important point, as the ambitions were non-standard and very ambitious.

Drivers – Intrinsic motivation was one of the main drivers, commencing this project with a clear vision for the office and by individuals being motivated to create a circular and sustainable office building. Other drivers that played a role were the support from the management to pursue with an unusual building, and the demand from KVE for collaboration.
Barriers – A barrier that was overcome during the project was the lack of financial resources, that was solved by the investment of AKEF. Another barrier was formed by the regulations regarding the development plan from the municipality.

4.2.4 Location management

The case of location management can be seen as an ongoing process. This case was chosen because location management has an impact on the sustainability performance of RHDHV, more accurately on the CO2 emissions of the organization. If more employees use public transport or go by bike instead of by car, this will cause less CO2 emissions. If a location has good accessibility with public transport, more employees and visitors might use public transport as means of transport, than when the office can only be reached with a car. Also, the availability of facilities for employees who travel by bike are relevant in this context, as these facilities can form an extra incentive for such travel.
During the interviews, sustainability did not come forward as a main goal or strategy within the location management. In the CO2 performance ladder report from the past years, goals were set for the mobility and office buildings of RHDHV, that included parts of the location management.

Problem stream – Within this case the problem stream is that the CO2 emissions caused by the commuting of employees of RHDHV needs to be reduced.
Solution stream – The solution stream involves taking the accessibility by public transport in consideration when deciding on the location of a new office and by providing facilities for bikers in existing offices. The location of an office plays a role in the commuted kilometers of employees, and on whether employees and visitors use public transport as mean of travel. Adding to this, facilities for bikers can form an incentive to use the bike instead of the car to travel. Employees that travel to the offices with their bike need facilities to stall the bike, have a shower and store their stuff.
Participant stream – The participant stream here are the services team within WPS, HRM and the employees of RHDHV.
WOO – More pressure has been put on the organization, because of a growing emphasis on sustainability within society. The growing concerns about the negative impact of CO2 emissions of cars formed the window to create policies for incorporating sustainability practices in the location management, in such a way that locations were strategically positioned in regard to public transport, and facilities for bikers were standardly incorporated in the design of an office building. When choosing a new location for an office, it is however still a compromise between different factors. When looking at the location of the office in Amsterdam, the location was not close to a big train station, but it is within walking distance of a metro station. The compromise here was that creating an energy neutral building was higher on the priority list than the public transport accessibility.

Drivers – The main driver within this case is the competitive position and reputation of the organization. Furthermore, growing awareness have led to more questions and demands from employees for good public transport accessibility and bike facilities within the offices.
Barriers – Ideally, all locations of RHDHV would be positioned near an Intercity-train station, however these locations are costly, and therefore compromises have to be made. Another barrier is the lack of clear strategic goals regarding sustainability within the location management, as there still other priorities weighing high as defined in the new strategy for offices since the office in Amsterdam was relocated.

4.2.5 Mobile working facilities

The emphasis within the organization of RHDHV is on working face to face, and when face to face is not possible, there are facilities for online working, for example from home. RHDHV sees working from home as a way to get a better balance in work and private life. Also, in some moments it might be more efficient to work from home a part of the day, due to appointments at clients for example. The general policy regarding this is that there is always a place for everyone in the office, and you can work from home, about 1 day every week. WPS facilitates online working through providing the tools, including the software and possible needed hardware.

The goal within the team of WPS for mobile working facilities regarding sustainability are not clearly described. Since the start of the reporting of the CO2 performance of RHDHV, the reports have included some things on mobile working facilities, for example in 2012 that the need for more video conference facilities has increased due to the merge. The ladder of 2013 included expanding the video conference hardware, and added plans for software to accommodate mobile working, calling and sharing screens. Furthermore, policy and exemplary behavior of the management were mentioned to promote video conferencing instead of travelling for meetings. In the version of 2015, the use of Skype for business and the growing number of video conference rooms were explained as a few of the reasons for a reduction in the emissions. In 2016 the goals for the reduction of CO2 emissions caused by mobility included expanding and updating the video conference facilities and coupling this function with Skype for Business. The set goals also included upgrading and continued implementation of the iRooms. In 2019 the report mentioned that RHDHV puts attention on the use of video conference calls and thereby to limit the CO2 emissions.

Global trends as well as innovations and technological development play a big role in this case. The evolvement of mobile working facilities within RHDHV is related to culture. In the Netherlands it has become normal to work from home, as ‘the new world of working’, of which ‘flex’ working is a part, has become a trend since the 00's. Within RHDHV, ‘flex’ working has gained traction in the past decades, which is related to the facilities and tools that are available for working remotely. Technological and social developments play a role in the developments of mobile working facilities in general, with visual becoming more important, following the trend of social media and for example Youtube, and more possibilities with computers and online working became available.

Problem stream – The problem stream in this case are the CO2 emissions caused by commuting and travelling between offices, within the Netherlands, but also between locations in other countries.
Solution stream – The solution stream is that employees should be able to work remotely and connect with others through online tools, wherefore it becomes possible to travel less. For working remotely, facilities and tools are needed, including a cloud-service, software and hardware.
Participant stream – The participant stream includes the WPS team, board RHDHV and different suppliers of the tools such as Box and Microsoft.

WOO – The coupling of these streams happened gradually, as different tools were implemented in the past decade. It has been possible to work remotely since the introduction of Box, where documents could be accessed remotely, and it has become easier to communicate since the introduction of Skype for business. The increased technical possibilities can be seen as a WOO. What also played a role here is that due to culture change within the Netherlands, where not working in fixed locations became normal, a window opened to develop and improve mobile working facilities.

TP – As this process was gradual, due to the continuous improvements and innovations, no real TP can be identified within this case.

Drivers – The drivers that played a role within this process are the technological developments of the last decades including software and hardware that make working remotely possible, competitive advantage due to digital innovations, and financial benefits due to lower travelling time and costs, because meetings can take place through tele- or video-conferencing. Also, the raised awareness for sustainability has led to employees wanting to travel less and therefore have alternatives for working remotely or having meetings online.
Barriers – The main barrier is the lack of clear strategic goals regarding sustainability, as the main goal of mobile working facilities is not sustainability, other factors might be prioritized.

4.2.6 Pension fund RHDHV

After the episode of Zembla in 2007, where controversial investments of pension funds in the Netherlands were revealed, the opinion of people regarding pension funds changed. Pension funds invest the retirement pensions of many people in the Netherlands, of which the majority does not have a choice in the pension fund, as this is often related to the organization or sector that one works in, and people often do not have a say in the type of investments that the fund makes. Pension funds have the responsibility to make profitable investments in order to provide for the retirement incomes of their participants. Reputation and trust from the participants are important factors within these funds, therefore public opinion is very important to these funds and as said during the interviews: “you do not want to make frontpage news”.

Breaking this down into the streams of Kingdon (2013):
Problem stream – The problem stream here is that pension funds are sensitive for reputational damage. The public opinion on investments of pension funds changed due to the Zembla episode on investments in cluster munition of pension funds in the Netherlands.
Solution stream – The solution for the pension fund of RHDHV was to stop investing in organizations that make controversial products, such as weapons and tobacco. By stopping these types of investments, the chance of having reputational damage would be reduced.
Participant stream – The participant here was the pension fund of RHDHV.
WOO – The problem of possible unsustainable investments became more pressing due to the investigation and episode of Zembla in 2007, where after the public opinion changed. This formed the WOO for the streams to be coupled and was used by RHDHV through making the decision to stop investing in ‘wrong’ things from 2012 onwards. The episode of Zembla formed the TP within this case, where after the board of the pension fund of RHDHV made changes in the policy regarding ESG investments.

In a similar way, a couple of years later, controversial investments of pension funds were revealed, regarding investments in organizations causing harm to the environment. Here again the public opinion played a role in the changes within the investments of pension funds towards ESG investments. As said during the interviews: “ESG was really upcoming, everybody was talking about it.” Since 2017 new policy came into force within the pension fund of RHDHV regarding ESG and responsible investments, which

more pension funds applied since then. Around the same time new regulations for ESG investments from DNB and the government went into force. The combination of these events, the increased attention for sustainability, wrongful things that were revealed and the upcoming regulations, seem to have led to changes within the policy regarding ESG. This is on the one hand reacting to outside events, such as the reaction to the shift in public opinion after the Zembla episode. On the other hand, the changes towards sustainability were made through intrinsic motivation, as the policy changes were ahead of the regulation changes, the pension fund was not obliged to make these changes.

TP – The episode of Zembla caused pension funds to make changes in their investment policies regarding sustainability, however it took several years before these policies were implemented. The Zembla episode can therefore not be seen as TP, but as a cause. The pension fund also made the decision to start impact investments, in projects that had a positive impact on the environment such as in organizations building wind parks. Returns on such projects were not smaller than the returns of other investments. The pension fund of RHDHV has therefore not faced any big decisions yet, whether to go for the returns or for the ESG impact. So on the one hand changes took place regarding ESG investments after the Zembla episode, but this has led to gradual rather than disruptive changes.

Drivers – The shift in public opinion and raised awareness regarding sustainability by the participants in combination with fear for reputational damage and bad publicity, were the main drivers for the pension fund in this case. Adding to this, within the case government regulations also formed a driver to do more.
Barriers – The main goal of the pension fund is to generate sufficient yield to provide for the retirement incomes, therefore sustainability, in the form of ESG investments, is not the main goal. Risk and the lack of priority are therefore the main barriers.

4.2.7 Business flights

Sustainability awareness has undoubtedly increased in the past decades, as people started to get more concerns about the negative impact of certain actions on the environment. Within RHDHV more and more questions came from clients, employees and the board on CO2 compensation of flights. The project team 'Anders Vliegen' within RHDHV was formed and started working on solutions for flight policy changes. New policies were created to reduce the number and the negative environmental impact of flights. Some employees of RHDHV that were concerned with the policy change had the wish for compensation of the CO2 that flights emit. An extra amount of money would be added to every booked flight, that would represent the damage that the CO2 emissions would cause, which would be later invested in projects having positive impact on the environment. This compensation would be built-in the online booking tool for flights and calculated the monetary value for CO2 compensation. AMEX, the travel agent, was asked to create this function, but was not able to deliver this extra function within the tool. The team for business flight decided upon this outcome to perform research for creating this tool within RHDHV, or for another way to calculate the CO2 compensation and to pass on the costs to the business lines.

The goal for mobility-related CO2 emissions for the period between 2012 and 2017 was a reduction of 20%. In 2014 the CO2 emissions caused by flights within the organization increased by 55% in relation to 2012, where a yearly reduction of 4% was desired. In 2015 the CO2 emissions decreased by 7% in relation to 2014, however the reduction goal of 4% each year was thereby not achieved. In 2016 the CO2 emissions increased with 20%. At the end of 2016 new reduction goals were drawn up, being a 10% reduction of CO2 emissions in 2020 compared to 2013. In 2017 a slight reduction in C02 emissions was visible. In 2018 new reduction goals for flights were formed, being a 10% reduction in 2022 compared to 2016, and in the same year the emissions were a little less than those of the year before.

When breaking this process down into the streams of Kingdon (2013), the following streams are identified:
Problem stream – The problem stream is that the CO2 emissions of RHDHV are high, and the business-related flights are the biggest cause of these emissions. The goals for CO2 reduction have been changed in the past few years, but the result is still that the flights make up almost 50% of the current CO2 emissions of the whole organization.
Solution stream – The solution stream involves new policies for flights to reduce the amount of flights, and CO2 compensation measures.
Participant stream – The participant stream includes the coalition 'Anders Reizen & Vliegen', the project team for Anders Vliegen within RHDHV and the board of RHDHV.
The streams were coupled by the fact that more attention went to the negative impact of flights on the environment, this led to a changing public opinion and the start of initiatives such as the coalition 'Anders Reizen'.
WOO – The WOO here was that the mapping of the CO2 emissions of RHDHV, for the CO2 performance ladder, gave insight in how pressing the problem of CO2 emissions resulting from flights was.
TP – The TP seems not to have occurred within this process. However, it can be argued that this is the built-up for a TP, which might follow when the change in flight-policy is adapted.

Drivers – The drivers within this case were raised awareness on the CO2 emissions through the performance ladder and regarding sustainability leading to employees of RHDHV asking for CO2 compensation. Adding to this, demand and pressure from external parties through coalition 'Anders Vliegen' and management support were drivers.
Barriers – Barriers within this case were costs and risk. Most business flights are made for the projects, forming the business for the organization, and adjusting the flight policy and reducing the amount of flights could have consequences for the projects or position of RHDHV. There was no existing software for the CO2 compensation, and lack of support by the travel agent for applying the CO2 compensation in the current booking tool. The lack of priority for the CO2 reduction caused by flights has led to an increase instead of decrease in emissions in the past years.

4.2.8 Solar panels office Amersfoort

As the goal was to increase the use of renewable energy within the offices, research was conducted for generating energy at the offices. Putting solar panels on the roof of the office in Amersfoort was already unsuccessful before research started, as it was already known by the services team of WPS that the construction was not strong enough to hold the weight. The solar foil however was an option, which was researched, forming the main process of this case. This project was not executed in the end, as the problem of enough investment was not solved.

Problem stream – One of the problem streams is that the CO2 emissions of RHDHV are partly made up of the operations of the office buildings, the organization its goal was to reduce these emissions.
Solution stream – The solution was to look for possibilities for reducing the CO2 emissions, by asking a team from the business line I&B for advice. The WPS services team initiated the involvement of the I&B team. The solution was to implement the already existing tool Fastlane to the office building of RHDHV in Amersfoort. This tool however did not yield the desired results, so a specialist of the same business line was involved, who came with the option to implement solar foil.
Participant stream – The participant stream is formed by the services team of WPS and the business line I&B.
WOO – The WOO here was the knowledge that was available within RHDHV. This gave the opportunity to look for fitting options for the office building, as it was in the best interest of WPS and the business line I&B to get the best results. Also, it was an opportunity for I&B to test their tool Fastlane.

Problem stream – Another problem stream was the solar foil option was costly and therefore had a long payback period. The lease contract of the office Amersfoort would only last a few more years, so the board of RHDHV was not willing to invest the whole amount for the solar foil.
Solution stream – The solution stream was formed by the owner of office building being involved, and he was asked to share the investment for the solar foil. The owner was not willing to invest, unless RHDHV wanted to extend their lease contract. RHDHV was not willing to extend contract, as they still wanted the flexibility to leave the building after the first lease contract.
Participant stream – The participant stream included the services team of WPS, the board of RHDHV and owner of the office building.

TP – There was no TP within this case.

Drivers – The main drivers within this case were the raised awareness of sustainability, intrinsic motivation by the services team to improve sustainability performances of the office building in Amersfoort. costs (business case/created Fastlane), internal knowledge.
Barriers – The barriers in the case were the lack of management support, high costs of the measures, and the lack of support from partners. Technological innovation also plays a part here, as the solar foil was a relatively new and therefore expensive option and there were no other compatible and affordable options for generating renewable energy at the office in Amersfoort.

4.3 Comparing the cases

In this section of the results chapter the cases are compared on the basis of the streams model, WOO, TP, D&B in order to identify patterns and salient aspects. The first sub section (4.3.1) of this chapter discusses the comparison of the process maps of the cases. Section 4.3.2 discusses the streams, WOO and TP over all the cases. In section 4.3.2 the comparison of the cases regarding D&B is made, creating insight in what the D&B mean in the cases and in the similarities and differences in their occurrence. In section 4.3.4 conclusions from the patterns and striking observations are presented.

For the comparison of the cases the characteristics, streams, WOO and TP are presented in the word table below (Table 7). The characteristics include the goal of the case regarding sustainability, the central figures and the time period. As can be seen in the table, the TP row is empty. This is because, as followed from the case interpretation section, no remarkable TP occurred within the processes of the cases.

	Waste management	Electrical lease cars	Office Amsterdam	Location management	Mobile working	Pension office	Business flights	Solar panels
Goal regarding sustain-ability	Circular procurement and FM	100% electrical lease cars by the end of 2021	Energy neutral and circular office with wellbeing of employee central	Locations positioned such to stimulate public transport and bikes	Reduce CO2 emissions by travelling less due to good mobile working facilities	ESG investments, sufficient returns, no bad publicity	Reduction of CO2 emissions of flights	Reduction of CO2 emissions of office Amersfoort
Problem stream	CO2 emissions caused by exploitation of offices, partly attributed to waste, which was not separated.	CO2 emissions caused by commuting with fossil fuel cars	CO2 emissions caused by energy use of offices	CO2 emissions caused by commuting	CO2 emissions caused by commuting and travelling between offices and abroad	Pension funds are sensitive for reputational damage and raised attention for ESG investments by Zembla	CO2 emissions caused by business flights	CO2 emissions caused by energy use of office buildings
Solution stream	Development of separation waste bins	Electrical lease cars	Energy efficient or neutral office	Location close to public transport and facilities for cyclists	Mobile working facilities for working and communicating online	ESG investments	Policy changes to reduce amount of flights	Fastlane tool to find possibilities for reducing CO2 emissions
Central figures – internal	Team procurement and FM – Services WPS	CEO RHDHV & Fleet manager	Director Services	Team Services WPS	Team Service Delivery – Services WPS	Director pension fund	Consultant sustainability RHDHV & CG RSB team	Director Services
Central figures – external	Lune GDCI		KVE Wijngaarde BAM AKEF		Software companies	Zembla journalists Government	AMEX Anders Reizen/Vliegen	Owner office building
WOO	New office buildings	Raised awareness – pressing problem	Multiple opportunities and events happening	Raised awareness – pressing problem	Multiple events, raised awareness, flex working trend, technological developments	Revealed issues – changed public opinion – pressing problem	Problem became more pressing through insight in CO2 emissions	Available internal knowledge and tools
TP	--	--	--	--	--	--	--	--
Time period	2013-ongoing	2016-2021	2014-2018	2012-ongoing	2000-ongoing	2007-ongoing	2015-ongoing	2017-2019

Table 7: Cross case synthesis table.

4.3.1 Comparing the process maps

The process maps of the different cases vary in length and number of events. When comparing the process maps visually, it can be seen that the cases of location management and mobile working facilities have a large span in terms of time period. However, the events in these two cases are less spread out. These cases are typically more about continuous policies and cannot be seen as a project with a start and finish. The other process maps are more similar regarding the number of events and the distribution of the events.

Within the cases, there are events and combinations of events that occurred in more than one case. These combinations of events can be seen as patterns of events. The found sequences of events are the following:

The first combination of events involves a pilot project occurred within a case, where after an initiative was implemented. This combination of events occurred in several cases in the following ways:

- In the case of waste management, there was a pilot project of separation waste bins in two offices. After this pilot project the waste bins with separation possibilities were implemented in all offices;
- In the case of electrical lease cars, there was a pilot project where a group of employees of RHDHV started driving an electrical lease car. After the pilot, which lasted a year, the policy for all lease cars was modified such that electrical lease cars became the standard;
- In the case of location management, the Amsterdam office can in some way be viewed as a pilot for the new approach for office buildings. This new approach is worked on further, and all new offices to be built follow this new approach.

The second combination of events involves an external event that triggered change. This combination of events occurred in several cases in the following ways:

- In the case of the pension fund, the Zembla episode on cluster munition triggering the changed public opinion regarding ESG investments. As a result of this episode, the policies regarding ESG investments was changed;
- Within the case of the business flights, the development and emergence of the C02 performance ladder created more urge to create insight in the emissions. The ladder led to insight in the large contribution of flights to the emissions;
- Coalitions were formed externally and were followed by an internal implementation. This was the case in two of the researched cases:
    - In the case of waste management, the start of the GCDI, led to the start of circular procurement, of which the waste management was one part;
    - Within the case of the business flights, the start of the ‘Anders Reizen’ and ‘Anders Vliegen’ coalitions formed the start of the research for changes in the policy.

The third combination of events included the demand or support from employees or from partners, which led to change. This third combination occurred in two cases, in the following ways:

- Within the case of business flights, more and more questions about and demand for compensation of the CO2 emissions have among other things led to changes regarding the policy;
- In the case of the pension fund, the change in public opinion, which was in turn caused by the Zembla episode, has led to changes in the policy. Furthermore, the opinion of employees of RHDHV also changed as a result of more awareness, leading to more questions that were asked to the pension fund about the sustainability of the funds.

4.3.2 Comparison regarding Streams, WOO and TP

In all cases the problem, solution and participant streams can be identified. In some cases, multiple sets of streams can be identified. The reasons why the streams were coupled could not in all cases be identified in hindsight.

The problem stream in many cases involves the CO2 emissions. The CO2 performance ladder plays a role here, as in the yearly CO2 report of RHDHV the goals and problems are operationalized regarding the emissions. The other problems and goals regarding sustainability remain rather general or are not clearly described otherwise. What also plays a role here is that sustainability is generally hard to quantify. CO2 is however one of the options through which this can be quantified, which makes comparing easier.

Regarding the solution stream: a solution must already be developed, as criteria for the solution stream. It can be argued whether this is possible to identify in hindsight, as it might be the case that solutions were developed for specific problems, after learning about the problem. Also, it sounds more logical to start creating a custom solution to solve a specific problem, after it is known. An example here for is in the case of the pension fund: the problem was the shift in public opinion after the revelations of Zembla, the solution was to stop investing in things that could result in bad publicity. This solution was already available to the pension fund before 2007. However, it was not fully implemented at that time, but the problem only became pressing after the episode of Zembla. After this episode the pension fund decided to apply the policy shift.

WOO appeared in different cases and resulted in decisions being made. In some cases, multiple WOO appeared. Some of these grasped opportunities seem to involve taking advantage of external events, that seem to be related to reacting or hooking onto trends or initiatives from outside the organization. A WOO that seemed to occur more often was a problem becoming more pressing due to raised awareness. Raised awareness was caused by events changing public opinion or creating more insight in a certain problem. Another WOO that reoccurred was an occurrence or event that was used as a steppingstone for change. An example of this are the new offices in the Hague and Nijmegen, or the outdated office in Duivendrecht.

When comparing the processes of the cases to the characteristics of TP (as listed in Table 1), there seem to be no TP at all. TP seem to be lacking as most processes in the cases seem to have progressed linearly or gradually, and not exponential or abrupt. For sustainability in general it can be argued whether sustainable practice is reversible on a scale relevant for human societies. It seems logical that when invested in sustainable solutions, one will not reverse these investments and restart unsustainable practice. Looking at the cases, the actions could all be reversible, but it seems illogical for the pension fund to start investing in weapons and oil again, or for RHDHV to increase the CO2 emissions. The other characteristics of TP include multiple stable states, which occurred in most of the cases, and feedbacks, that are irrelevant in the cases.

Within the whole of enhancing sustainability, the TP can be seen as the point where sustainability was a normal, well-accepted concept and integrated in all decisions. As in the spread of a virus, when a few isolated cases suddenly shift towards a lot of cases appearing in many different locations. This is how sustainability awareness has spread throughout society in the past decades. Within RHDHV there were a few sustainability projects and initiatives before ten years ago. However, in the last decade awareness grew and there were multiple initiatives regarding enhancing sustainability. It was often said during the interviews that sustainability was ‘ticking a box’ before approximately ten years ago but is now an integrated part within processes. The question arises whether the TP has actually already occurred and whether sustainability is really an integrated part of processes, as is implied by these statements.

4.3.3 Comparison regarding Drivers and Barriers

In this part of the comparison, the D&B for sustainability within the cases are described. The first table (Table 8) describes the driver category with the connected drivers that occurred within the cases. The second table (Table 9) shows the occurrence of the drivers in each of the cases. The same is given for the barriers in Table 10 and Table 11.

Drivers

	Category	Drivers within the cases
D1	Costs	Some sustainability initiatives also included efficiency improvements, that had the ability to lower costs, such as the replacement of small bins by larger separation bins, reducing the cleaning time and therefore costs. Travelling abroad for projects or between offices is time consuming and costly, so by improving mobile working facilities, these costs could be decreased. Also, value could be created from projects such as the iRooms, CO2 compensation tool, electrical lease cars and the offices, by giving advice or selling products.
D2	Management Support	Management support is in some cases necessary for the approval of initiatives or investments. Also, the support seems important in giving the good example, such as in the pilot project of electrical lease cars and the management meetings being done through tele- or videoconferencing.
D3	Government	The start of an initiative by the government can form a driver, such as the GD for the waste management case. Financial benefits or relaxation of regulations formed a driver during the case of electrical lease cars.
D4	Awareness	The raised awareness about sustainability formed a driver in many of the cases, as this led to more questions from employees in the cases of business flights and location management and more pressure due to a shift in public opinion in the case of the pension office.
D5	Technology	Technological innovations formed the driver in the electrical lease cars as it was possible to start such a pilot due to recent innovations with electrical cars. This is also relevant for the mobile working facilities, as working remotely has become possible due to innovation.
D6	Competition	RHDHV is a relatively small player in the world within its field and because it is such a small player it wants to be frontrunner in the niche market to keep good competitive position. Competition formed a driver in the case of mobile working facilities, as RHDHV has distinguish itself in the niche market they are active and does this by creating a competitive advantage through technological innovations. RHDHV wants to be located in such places that are easily accessible, for competitive advantage regarding attracting the right employees.
D7	Reputation	RHDHV wants to position itself as a sustainable organization and therefore driving electrical cars fits with that image. This also accounts for location management, as good positioned offices may result in more use public transport, which is good for the reputation. For visible measures, such as the separation bins and the office in Amsterdam, reputation also formed one of the drivers.
D8	Demand/Pressure External Parties	The project of the office in Amsterdam was partly initiated by the involvement of KVE, an external party wanting to collaborate. The pension office was driven to make changes by the episode of Zembla, and the business flights accelerated when the coalition 'Anders Vliegen' organized events and created the best practices rules. Also, the CO2 performance ladder played a role in many of the cases, which can be seen as a form of peer pressure.
D9	Intrinsic Motivation	Many of the cases were initiated by intrinsic motivation of individuals, or this driver had a role in another part of the process, as it fit within the vision and strategy of the organization. For the electrical lease cars there was a clear goal to be achieved, that fit within the company image, which formed an important driver.

Table 8: Drivers for sustainability of the cases.

	D1	D2	D3	D4	D5	D6	D7	D8	D9
Waste management	X	X	X				X		X
Electrical lease cars		X	X	X	X		X		X
Office Amsterdam		X					X	X	X
Location management				X		X	X		
Mobile working	X			X	X	X			
Pension office			X	X			X	X	X
Business flights		X	X	X				X	X
Solar panels				X					X

Table 9: Occurrence of drivers for sustainability of the cases.

Barriers

	Category	Barriers within the cases
B1	Costs	Costs play a big role in enhancing sustainability within the SA of RHDHV. Generally, RHDHV is not willing to spend too much on this transition, as it does not generate direct returns.
B2	Management Support	A lack in management support might lead to a project not being successful, this might be the case for the solar panels. If there was enough management support, the solar foil might have been placed, despite the high costs.
B3	Government	Regulations of the municipality has been a barrier in the progress of the rebuilding of the office in Amsterdam.
B4	Awareness	The lack of awareness on sustainability has led to negative attitudes about the waste management, as some employees did not understand the relevance of the measures.
B5	Technology	The scarcity of batteries and capacity of power were technological barriers within the case of electrical lease cars. Tools for CO2 compensation being unavailable formed a barrier within the business flight case.
B6	Knowlegde, Skill and Information	The lack of knowledge or information formed a barrier in the case of waste management and mobile working facilities, as this has led to wrong waste separation and the stream not being clean at first, and in unclarity about what software to use for what purpose.
B7	Time	Time has not shown to be an important barrier within these cases.
B8	Support (Employee/Partner)	The lack of support from employees is a barrier in the case of waste management; employees were complaining about separation of the waste. Negative attitudes about the functionality of the electrical cars also formed a barrier.
B9	Competition	Competition has not shown to be an important barrier within these cases.
B10	Risk	RHDHV wants to be frontrunner, but not willing to take much risk, so as a criterion for RHDHV, solutions have to be proven working well in order to be implemented. They want to be frontrunner, but not willing to spend too much money or willing to experiment and take too much risk. Risk is a barrier for the pension fund for investing more in sustainable projects, as their main goal is to have enough returns on the investments.
B11	Intrinsic Motivation	A lack of vision, priority and incentives for sustainability has formed a barrier in multiple cases. Within the business flights, location management and mobile working facilities sustainability does not seem to have a high priority.

Table 10: Barriers for sustainability of the cases.

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Waste management				X		X		X			X
Electrical lease cars	X				X			X			
Office Amsterdam	X		X								
Location management											X
Mobile working						X					X
Pension office										X	X
Business flights	X				X			X			X
Solar panels	X	X						X		X	

Table 11: Occurrence of barriers for sustainability of the cases.

4.3.4 Patterns and striking observations

Patterns and striking aspects are identified by comparing the cases. In this section the found patterns and most striking observations are elaborated on. Patterns can be sequences of events or multidimensional. As followed from the methodology chapter (section 3.3.4) the patterns that have been chosen to focus on are the sequences of events. First the patterns of events that followed from the analysis of the process maps are explained. Second, the striking observations are elaborated on, which are split up into observations regarding the characteristics of the cases; streams, WOO and TP; and D&B.

There are probably more patterns and striking observations to be found within the cases, but here is focused on the most important patterns and observations. The outcomes of the striking observations, including the contextual aspects, were remarkable and could be better distinguished. Therefore, it was chosen to focus on the striking observations for the narratives. The narratives of two of the cases are explained in the next section of this chapter and will serve as examples to create a better understanding of the striking observations. The most important observations and the occurrence of these observations in the cases are presented in Table 12.

Patterns – Process maps

Following the analysis of the process maps of the cases, combinations of events seem to reoccur. These sequences of events that reoccur, as discussed in section 4.3.1, are the following:

- A pilot project occurred within a case, where after an initiative was implemented. The implementation was either the rolling out of the pilot project or change of policy. In all cases where this sequence of events occurred, this led to change;
- An external event that triggered change within RHDHV. The trigger was an externally formed coalition or an event that caused more awareness, which led to changes within the way of working;
- Demand or support from employees or from partners which led to change. More questions or a changed opinion, as a result of raised awareness regarding sustainability had caused changes in policies.

Striking observations

Apart from the patterns, observations were made which can be categorized in characteristics of the cases; streams, WOO and TP; and D&B. These observations are contextual aspects and observations that stood out when comparing the analyzed cases.

Characteristics of the cases

The goals of the cases regarding sustainability were not clearly presented in the case documentation. Moreover, during the interviews the goals were asked about and in some of the cases no clear goals were present regarding sustainability. Therefore, some of the goals were derived from general documentation regarding sustainability of the organization, such as the CO2 performance ladder. Also, goals were interpreted from the given information. The goal in each case is different, but many involve the CO2 emissions, which also forms the problem stream in most cases. The striking observation here is that the goals of RHDHV for reducing the CO2 caused by business flights have been adjusted downwards several times in the past years.

The involved parties show similarities because the services team (part of SA WPS) is often involved and plays a key role. The external parties differ, but in two of the cases these involve coalitions involving the government.

Part of the cases are long-lasting processes, over several years, such as the location management and mobile working facilities, which are processes of continuous improvements. Other cases are more in project form, with a clear beginning and end. Examples of this type are the office in Amsterdam and the electrical lease cars, which seem to be related to having a clear goal. Some cases are in between, such as the business flights and pension fund. These have clear goals but are also long-lasting and ongoing.

Streams, WOO and TP

When overseeing the different streams of all the cases, some patterns and striking observations that can be identified. The problem streams of most cases involve the need to reduce the CO2 emissions caused by either mobility or offices. This is in most cases the underlying problem, as the CO2 emissions need to be reduced in order to increase the sustainability performance. The solution stream comprises the use of technical innovations and policy changes. Regarding the participant stream: some participants or teams had an important role in multiple cases, of which the services team of WPS had an important role in most cases.

Raised awareness can be caused by an event putting more attention to a problem, and in some cases causing a problem to become more pressing. Raised awareness as such is the most common WOO that enabled streams to couple. In such an instance, more people are aware of a certain problem, which can cause more questions to the management or other people who responsible for the matter. Apart from more questions, raised awareness also causes actions immediately. For example, if people disagree with certain issues, they can decide to leave the organization. Also, combinations of events and causes formed the WOO, such as in the case of mobile working. In the last-mentioned case, multiple events formed the WOO, among which is the trend of remote working; the technological innovations in software; and raised sustainability awareness leading to people wanting to fly and travel less.

Drivers & Barriers

An interesting aspect that can be identified in the analysis regarding the D&B from the literature is that all the drivers from the selection of most relevant drivers (Table 14) occur at least in two of the cases. Generally, two or more drivers are found per case. Costs, technology and competition occur as important driver in least cases, whereas awareness and intrinsic motivation form a driver for sustainability in almost all of the cases. The driver of intrinsic motivation is explained as sustainability fits within the culture of the organization or that the organization feels a moral or ethical obligation to act sustainably.

Costs, the lack of support from employees or partners and the lack of intrinsic motivation are the most common barriers throughout the cases. The barrier of a lack of intrinsic motivation is explained as a lack of vision or priority for sustainability within the organization. The barriers time and competition do not seem to play a role. Some cases involve few barriers whereas other cases had four distinct barriers. The solar panel case was not executed in the end, and the business flight case is not fully executed yet. Both of these cases involve four different barriers. As the case of waste management also involved four barriers, an initiative being less successful cannot be attributed to the number of barriers.

Most striking observations

Following the above-mentioned observations, the selection of the most relevant observations and contextual aspects are the following:

1. Intrinsic motivation from individuals to start initiatives or projects for enhancing sustainability. Within the case of solar panels to search for more options than the suggested options by Fastlane. Within the case of the Amsterdam office it was the motivation of the services team to create ambitions regarding sustainability and circularity for the offices. In the case of the electric cars the CEO had the wish to start this project. Within the business flights-team there were individual who were motivated to change the current situation. All these motivations are not the only driver within the cases but are important for the progress of the cases.
2. Trends or external events are hooked onto. Within the case of the business flights this was the 'Anders Reizen' coalition. Change within the pension fund followed the change in public opinion caused by revelations about cluster munition. Also, the pension fund was a little ahead the implementation of laws regarding ESG investments. This however can be characterized as following the flow of change, rather than pro-actively taking steps.
3. In some cases, if changes were already taking place or decisions already needed to be made a sustainable alternative is chosen. For the Amsterdam office-case this is that the Amsterdam Duivendrecht office was outdated so needed to be moved. Another example is the implementation of the separation waste bins, which were bought when new bins were required for the new offices in Nijmegen and The Hague. This shows that low hanging fruit is picked with small risk, instead of taking big steps towards sustainability with possibly more risk.
4. The lack of a clear vision for enhancing sustainability and priority regarding achieving sustainability. This leads to some cases seeming to be unorganized and include many separate projects of measures with different sub-goals, instead of one clear goal to be achieved. Location management and mobile working facilities are subjects that are logically linked to enhancing the sustainability performance. But within both cases sustainability does not seem to be the main driver for change. Furthermore, the lack of priority for sustainability can be seen in the case of business flights, whereas there was a long period of time within this case where not much happened regarding reducing the already known CO2 emissions.

	Observation 1	**Observation 2**	**Observation 3**	**Observation 4**
Waste management	X	X	X	X
Electrical lease cars	X			
Office Amsterdam	X		X	
Location management				X
Mobile working				X
Pension office		X		
Business flights	X	X		
Solar panels	X			

Table 12: Most striking observations of the cases.

4.4 Narratives of two cases

In this part of the chapter on results, two of the eight cases are zoomed into. This has the goal to create a better understanding of the processes, patterns and observations. By creating the narratives, the observations that are mentioned in the previous section are further explained. The previous sub-chapter focused on the identification of the patterns and the general descriptions of the observations. This part is focused on the narrative of these aspects within the selected cases.

The two chosen cases are waste management and the electrical lease cars. The case of waste management comprises many separate projects and initiatives all under the title waste management. This is a case in which a lot of employees are involved on a daily basis. The separation of waste needs cooperation, and many employees as well as partners have opinions regarding this in the form of negative attitudes or a lack of cooperation. The electrical lease cars form a case which is seen as the showpiece for successfully enhancing sustainability. It is a clear project with a set goal, budget, planning and clear responsibilities. The two cases are a representation of the eight cases, as they have different processes and different characteristics. One is an ongoing process of improvements commenced by the commitment to a government initiative, whereas the other is more of a project, started through the vision and motivation of the CEO.

4.4.1 Waste management

The case of waste management concerns many separate projects and initiatives all under the title waste management. This case was set up as having one main subject, being waste management. During the interviews the team that is responsible for procurement and FM was asked specifically for the processes concerning the waste stream. There is not one team that is solely responsible for the management of the waste, as this is a part of the procurement and FM. The team is part of the services part of SA WPS and is also responsible for the contracts with several suppliers in which waste management also plays a role.

Process map

Within the mapped process of the case of waste management (C1. Waste management) the most important identified streams cannot be directly identified when looking at the map. The streams can be linked to a combination of events and the reasons these events happened, rather than to single events. The problem stream involves the waste not being separated and therefore not circular, this is not a single event but involves the whole waste management as it was before. The solution stream involves innovations regarding waste separation, which is an external series of events. The participants included several parties that were involved in the waste management internally and externally.

The WOO within the waste management case was that the new offices in The Hague and Nijmegen needed new waste bins. This WOO can therefore be partly assigned to the event of the relocation of the offices in The Hague and Nijmegen. This relocation is an event that was explained in the organization-wide context, as this affected multiple cases.

Striking observations

The striking observation comprising a lack of a clear vision and priorities regarding sustainability (observation 4) can be identified in this case. RHDHV has had a general sustainability policy and goals regarding sustainability for the whole organization since the merge, in which the SA, amongst which is the FM, have played a part. However, no clear goal was described regarding the circularity of the procurement and FM, or more precisely about the waste management.

Intrinsic motivation from individuals is another observation that was made (observation 1). This motivation to start initiatives or projects for enhancing sustainability, or to make improvements during the process, is seen as an important driver. In this case of waste management this was through the

intrinsic motivation of the team of procurement and FM towards circularity. This motivation is not the only driver within the case, but this led to the circularity being integrated in many more parts of the procurement and FM.

Another observation that was made was that of the trends or external events that are hooked onto (observation 2). Within the case of the waste management case this was the GCDI. The GDCI is an initiative by different organizations and the Dutch government in 2013, to which RHDHV committed from the start. The GDCI implementation commenced in 2014 and includes the implementation of at least trajectories for circularity within the organization. Waste is one of the pillars within the GDCI, as circular procurement includes the reuse and recycling of waste.

Adding to this, within this same observation, different trends and events that occurred in the last decades have led to the enhancement of sustainability within the waste management of the offices. It is therefore a combination of events and factors that lead to the decisions in this case. One of these trends was more awareness and attention that came for sustainability and circularity in the past decades, leading to innovation and the development of sustainable solutions. One of these innovations was the Split-3 waste bin, developed in 2014 by Lune. In 2016 the Split-3 bins were replaced with Split-4 bins and were implemented in all offices, together with the organization and implementation of separation and recycling in the whole waste stream.

Another trend was a new way of working, partly fed by Microsoft head Bill Gates, arose (Peters, Bruijn, Bakker, & van der Heijden, 2011). Part of this 'new world of work' is the trend of 'flex' working, which means that employees do not have a fixed desk within the office but can sit at any desk that is available. This trend was upcoming in the Netherlands and led to RHDHV applying this concept of unfixed desks in the design of the new offices in The Hague and Nijmegen in 2014.

For the new offices in The Hague and Nijmegen, new waste bins had to be bought. It was no longer desired to have a waste bin for every desk, but larger bins every so many desks, for reducing the emptying time and therefore costs, and because of the unfixed desks. This opportunity was taken to buy waste bins with separate compartments so that waste separation and recycling could become possible. The observation that is made here is when changes are already taking place, or decision already needed to be made, a sustainable alternative is chosen (observation 3).

4.4.2 Electrical lease cars

Before 2012, a goal within Haskoning was to reduce the emissions of mobility by 5%. Within DHV there was a goal, to be reached in 2015, to start using alternative fuel cars and another to use more fuel-efficient cars. With the merge of the organizations Haskoning and DHV in 2012, new policy and goals for RHDHV were created. The footprint of the whole organization was analyzed, leading to insight that the footprint is for a great part comprising the emissions from fossil fuel lease cars. To reduce these emissions, innovation within the mobility of RHDHV was needed. In 2013 the emissions from mobility increased with 5%, and in 2014 and 2015 the reduction goals were also not achieved.

Process map

When looking at the process map of this case (C2. Electrical lease cars), some of the streams that flow through the process can be observed. The problem streams, including the CO2 emissions, technical issues and lack support from the employees, cannot be attributed to single events in the maps. One of the solutions streams, being the implementation of electrical lease cars, can be linked to the event of the expressed wish by the CEO. The set of streams including this solution stream is depicted in Figure 17. The other solutions streams: the software solutions and the pool of fossil fuel cars, cannot be linked directly to events in the map. The same is true for the participants, who were involved throughout the project, and cannot be attributed to single events.

The three WOO that are identified within the process have different forms and scales. The first WOO is the insight in the CO2 emissions, by the CO2 performance ladder, that is reported since 2012. This cannot be identified in the process map, but is part of the organization-wide context, because it has influence on multiple cases. The CO2 performance ladder is therefore an indirect reason for this case. The other two WOO are a combination of internal and external events, including the problem to become more pressing and several innovations, and cannot be directly identified in the process map as single events.

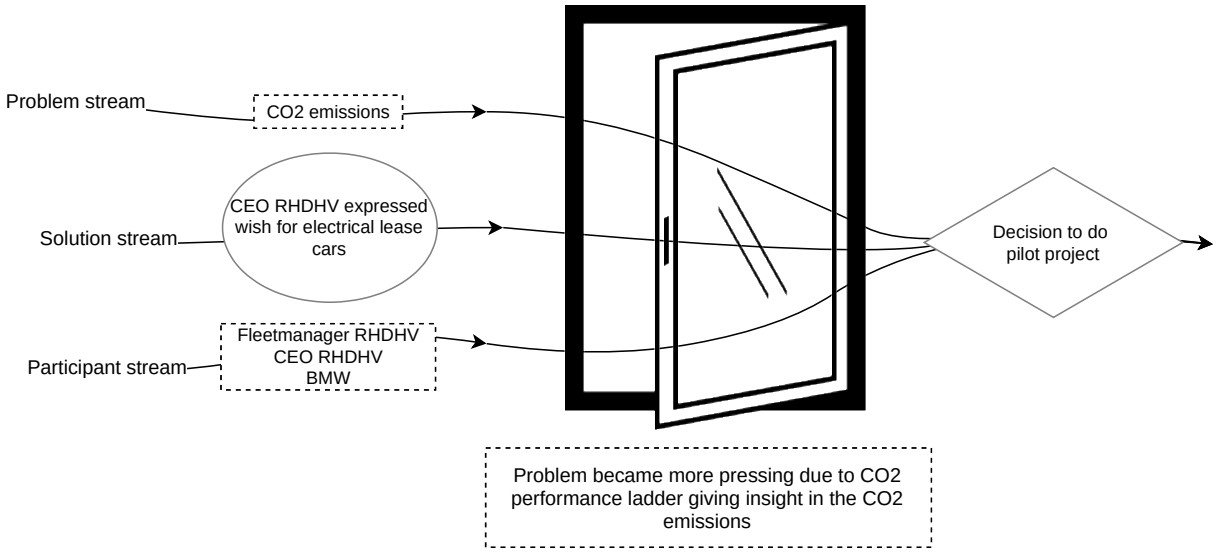


Figure 17: Set of streams and WOO.

Striking observations

The CEO of RHDHV has the wish to turn the lease fleet 100% electrical, as one of the ways to reach the CO2 goals, which he expressed in 2015. The most striking observation within this case is therefore the intrinsic motivation (observation 1). This intrinsic motivation of the CEO marks the start of the project for electrical lease cars, starting with research, a pilot project and eventually a change in the policy of lease cars. This also shows the importance of the management support, as the CEO has the leverage and decision power. The intrinsic motivation is a powerful mean to get changes to take place.

From the surveys that were held amongst the participants of the pilot project, the outcome was that generally employees are enthusiastic about driving the cars and about the pilot project. They felt that this fits within 'Practice what you preach' and the companies' goal of 'Enhancing Society Together'. Not all employees of RHDHV with a lease car are enthusiastic about the electrical cars, as some are dissatisfied by the functionalities of the cars. The lack of support from employees was a barrier, but this was overcome by creating short-term and long-term solutions. A short-term solution was that for these employees, there was still the possibility to use a fossil fuel car, from the pool of cars with unfinished lease contracts. The long-term solution was that since the start of the project, technological innovation has led to improvements in the functionalities of the cars. Another barrier that was present in the case is that batteries of electrical cars are scarce, forming a technological barrier. This however did not form a large barrier that endangered the process, however it slowed down the growth of the number of electrical cars.

Concluding, in the case of electrical lease cars there was a clear goal, and powerful drivers such as management support and intrinsic motivation that have led to a successful result for this case.

5. Discussion

This chapter focusses on the fourth sub-research question: '*How can the findings of the case study contribute to enhance sustainability in supporting activities of Engineering Consultant Organizations?'*. The chapter starts with the discussion of the research findings, related to the found literature. Subsequently, the implications for engineering consultant organizations (section 5.2) is discussed. The coronavirus in relation to this research is discussed in section 5.3. The discussion chapter is concluded with the limitations of this research (section 5.4).

5.1 Implications for theory

The research gap that was identified and mentioned in the first chapter included the need for more research regarding D&B for sustainability in organizations. It also included the lack of research regarding sustainability in the SA of organizations. This research has tried to contribute to both of these gaps, through using the existing literature on D&B and examining the occurrence of these within one organization its transition towards sustainability. Furthermore, the focus on the SA has formed an addition to the little available literature on this.

When summarizing the found observations, the intrinsic motivation of individuals (observation 1) seems to play a big role in the enhancement of sustainability within RHDHV's SA. This is on the one hand a positive aspect, that employees are intrinsically motivated to make improvements regarding sustainability. On the other hand, it can be argued whether the enhancement of sustainability would also be continued if these individuals were not proceeding their ideas. The question arises whether the motivation for sustainability comes from individuals or is embedded in the organization's vision and strategy. RHDHV seems to hook onto trends and external events (observation 2), such as the coalition 'Anders Vliegen' or the GDCI. RHDHV makes use of changes that are already taking place (observation 3), such as items that were already planned to be replaced, or of a move that was already planned. It seems as if RHDHV is going with the flow of external events and trends or is only picking low hanging fruit, which leads to the assumption that there is a lack of vision and priority regarding sustainability (observation 4).

When we relate these findings to literature, we find relations with the strategy theory of Whittington (2001). Whittington (2001) built on theories about strategies, amongst which was Mintzberg's, and categorized the different theories into 4 types of strategic management, being classical, evolutionary, processual and systemic, depicted in Figure 18. Comparing the most striking observations of the case study to the strategies in organizations by Whittington (2001), the processual strategy seems to be relevant. The processual strategy has multiple goals, such as ethical, social or stakeholder interests, rather than the main goal of profit maximizing (Pilbeam & Corbridge, 2006). Moreover, knowledge-based organizations often have a processual strategy (Pilbeam & Corbridge, 2006), which RHDHV is. Processes within the case study of RHDHV seem to be emergent rather than deliberate, as trends and external events are used as a stepping-stone for sustainability. The implications of the processual strategy, comprising staying low and going with the flow (Whittington, 2001), match with the hooking onto trends and using already planned changes to apply sustainability initiatives.

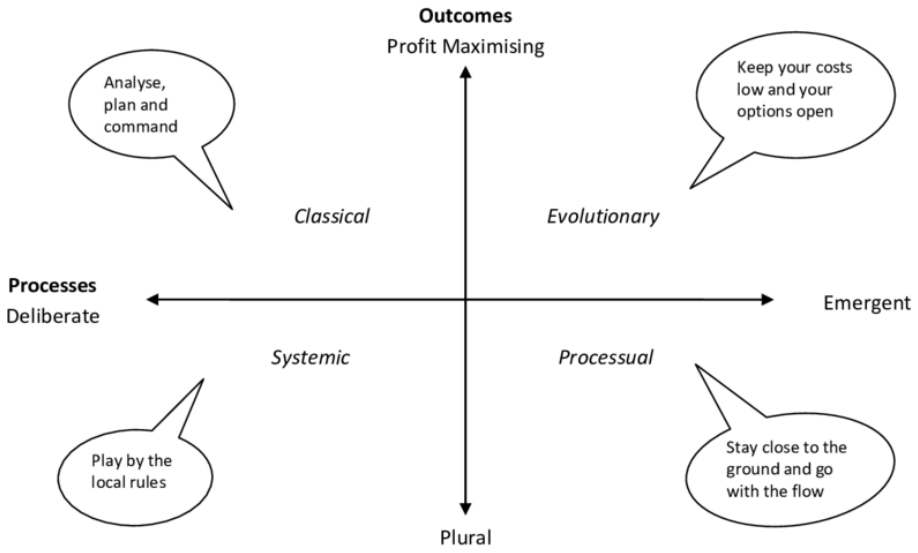


Figure 18: Generic perspectives on strategy and summary implications (Whittington, 2001, p. 10).

5.1.1 Drivers & Barriers

Through the literature review nine categories of drivers and eleven categories of barriers for sustainability in organizations were identified as the most common in the reviewed articles. In the analysis of the cases all categories of drivers were found to be relevant, but only nine of the eleven categories of barriers matched the findings of the cases. The two categories that were not identified as important barriers in the cases were time and competition, which in literature included barriers as a lack of time, time consuming, lack of competitiveness and unwilling to exchange information. The drivers that occurred the most within the cases are the awareness, intrinsic motivation and reputation. The barriers that were most relevant are the lack of intrinsic motivation, costs and the lack of support of employees or partners.

The patterns and striking observations that were found in the analysis regarding D&B are related to the literature on D&B for sustainability. Orji (2019) identifies inadequate proactive plans as a barrier for sustainability in organizations, which connects to the observation describing the lack of vision and priority (observation 4) that is occurring in multiple cases. Stewart et al. (2016) agrees and adds to this that the lack of goal translation to functional and department basis also forms a barrier, as well as the lack of function integration and cooperation. Others describe similar barriers, which are all categorized under the lack of intrinsic motivation, including a lack of vision, priority, proactive plans, strategic goals, responsibility distribution and clear incentives. However, there are scholars that do not mention the lack of intrinsic motivation as an important barrier for sustainability in organizations (Domingues et al., 2017; Muduli, Govindan, Barve, & Geng, 2013; Walker, Di Sisto, & McBain, 2008). Adding to this, the driver 'intrinsic motivation' matches the observation describing intrinsic motivation from individuals to start initiatives or projects for enhancing sustainability (observation 1), that occurred in multiple cases.

The striking observation of trends or external events being hooked onto (observation 2), can be seen as a driver. Looking into the literature on D&B for sustainability in organizations, an increased level of social awareness regarding sustainability (Lozano, 2015; Lozano & von Haartman, 2018; Tura et al., 2019), increased internationalization (Tura et al., 2019) and crises (Lozano, 2015; Lozano & von Haartman, 2018) can be seen as trends or external events that drive sustainability.

Some scholars categorize drivers in internal, external or connecting drivers (Lozano, 2015; Lozano & von Haartman, 2018; Walker et al., 2008). The internal drivers include the intrinsic motivation, risk and management support, connecting drivers comprise crises and reputation. Among the external drivers

are regulations and demand, and pressure from external parties. This also plays a role in the observations, as there can be made a distinction between internal, as well as external observations. Internal observations include the intrinsic motivation (observation 1), sustainable alternative of already planned changes (observation 3), and lack of vision and priority (observation 4). Trends and external events being hooked on (observation 2) can be seen as external observation.

5.1.2 Decision making theory – streams, WOO, TP

Streams model

Relating the findings of this research to the literature on the streams model, the streams that were found relate to those described in literature. The process in each of the cases was linked to the streams model, identifying problem, solution and participant streams in each of the cases. What relates is that when the streams meet, progress is made. However, Teisman (2000) states that streams are mostly independent of each other, whereas the findings in some cases do not support this statement. Also, the solution must be already prepared before the problem appeared according to (Kingdon, 2013), which is not always the case within the processes.

The streams that were found through the analysis of the processes, do not always seem to be logical when reflecting on the processes. It seems a logical consequence to start creating a custom solution to solve a specific problem, after that specific problem became apparent. This appears in the case of the office in Amsterdam, where the solution to the problem of high CO2 emissions cause by the offices was solved by creating an energy neutral office. The solution of energy neutral offices already existed before this time, but the specific solution of the office in Amsterdam was only designed when the problem appeared, and the streams were coupled.

Windows of Opportunity

There is a relation between drivers for sustainability and WOO, as mentioned earlier in the literature chapter regarding crises. Examples of these are crises, regulations and legislations, and the raise of awareness. This relation is also apparent in the drivers for sustainability and the WOO that were identified in the case study. Trends and external events being hooked on is found to be one of the striking observations throughout the cases (observation 2). This observation can also be seen as WOO of a problem becoming more pressing through increased attention to a specific problem.

There also seems to be a relation to the found WOO and barriers for sustainability in organizations. Increased pressure from peers, the market, or from society in the form of a change in public opinion can be seen as a WOO. On the contrary, the lack of, or insufficient, pressure from society is seen as a barrier for sustainability in organizations (Muduli et al., 2013).

Tipping Point

The presence of TP in the case study is very limited. Characteristics of a TP include the abruptness and limited reversibility. When looking at the results of the case study, it is mainly the abruptness, which should cause circumstances that are out of proportion, that cannot be detected. When looking at the definition of TP, it might be questioned whether these can be identified in such a context at all. TP make sense when researching epidemiology or worldwide trends, but in the context of organizations the characteristics of TP seem out of proportion.

The lack of TP could be a case of ‘no pain, no gain’, whereas in transition theory it is stated that transition supposed to cause ‘pain’. When no or not enough ‘pain’ is experienced, there might be not sufficient change taking place to reach the goal. Times of transition, especially transitions regarding sustainability, go hand in hand with uncertainty, disturbance and fear (Grin et al., 2010). Generally transitions do not proceed smoothly, as many barriers and problems will appear on the path towards transition (Grin et al., 2010).

Regarding sustainability within the organization or RHDHV in general it can be argued whether the TP has already been reached. Sustainability has become a more important part of the SA of RHDHV, as the CO2 performance ladder is a recurrent report, and several initiatives have been taken in the different parts of the SA. However, the responsibilities are sometimes unclear and the goals for CO2 reduction have not been reached and even been adjusted downwards several times in the past 10 year. This leads to the assumption that the strategy and execution of sustainability performance improvements does not seem to be an integrated whole within RHDHV. The TP of general awareness and understanding of the importance of sustainability might have been reached. However, the TP for sustainability performance within the organization of RHDHV might not have been reached yet.

5.2 Implications for engineering consultant organizations

The organization of the case study, RHDHV, is an engineering consultant organization, providing advice for clients. What characterizes such an organization is be up to date on trends, as these trends play a big role in their advice to others. This characteristic can be related to hooking onto trends and events, as seen in observation 2.

This research is relevant for all organizations that want to improve the sustainability performance of their SA. By looking at the processes regarding sustainability within the SA of any organization, important D&B for sustainability can be identified. By looking at decision making processes, possible WOO and TP can give more insight in the D&B.

The findings of this research can be applied in other organizations, as the patterns and observations that were found in this case study might be occurring in other organizations. By the insight in these patterns and observations that this research has created, it might become easier to identify these patterns and make the observations within another organization. Through this insight, processes of enhancing sustainability can be improved, possible drivers can be strengthened, and possible barriers can be overcome.

5.3 Coronavirus

Crises can be seen as an opportunity for change (Grin et al., 2010). Lozano and von Haartman (2018) and (Lozano, 2015) mention economic or social crises as drivers for sustainability in organizations. The outbreak of the coronavirus, or SARS-CoV-2, causing the disease COVID-19, can be viewed as a social crisis (Simoni & Hofmann, 2020). As described in the literature chapter on WOO, a crisis such as the corona-crisis can cause a window to open, or by changed priorities cause a window to close (Moser & Dilling, 2007). The TP of the virus outbreak, described earlier in the literature chapter as the moment in an epidemic when a certain virus has affected a critical amount of people, has been reached and even developed to be a pandemic. As the corona-pandemic is still ongoing at the moment of writing, the consequences of this virus cannot yet be overseen.

During the last round of the interviews, which took place during the outbreak when most of the interviewees were working from home, according the advice of the national government, the impact of the coronavirus on sustainability in organizations was discussed. The virus was on the one hand seen as an opportunity, for example for working from home. Employees of RHDHV were forced by the pandemic to work from home, and employees who did not work from home yet due to various reasons, might have installed all the necessary software and acquired the appropriate furniture. Some of the possible barriers for working from home have therefore been taken away, creating an opportunity for working from home more often in the future. Also, during the pandemic more use was made of mobile working facilities, and a new tool that was planned to be gradually implemented experienced an accelerated

application. Moreover, the pension fund was forced to change one of their procedures, digitalizing their signature procedure, which was ready to be implemented, but the priority was not high enough before. The crisis formed the window to implement this new procedure. On the other hand, ways of working had to be modified as a result of the pandemic, costing time and caused priorities to shift. An example of this was the change in flight policy, which was about to be presented to the board when the government announced corona-related measures, leading to a shift in priority. Also, as there were hardly any business flights made, goals for CO2 emission reductions of RHDHV automatically came closer, so the urge was less.

5.4 Limitations of this research

Within the amount of time taken for this research, there was chosen for eight cases within one organization. To make even more solid conclusions, more cases could be looked at. Only one organization was focused on in this research, whereas multiple engineering consultants have to be looked at to draw conclusions for sustainability in the whole sector. This forms a limitation, as it provides only the views and processes of one organization. Another limitation of this research is the documentation of the cases being limited for some cases. Meeting minutes were not always made for internal meetings regarding the SA. This can be attributed to the fact that most decisions were made internally within RHDHV and did therefore not always require official documentation. Also, as there are fluctuations in the staffing within the SA, some information or documentation got lost.

6. Conclusion

In this chapter the conclusions of this research are described on the basis of the sub research questions, followed by answering the main research question. Recommendations for engineering consultant organizations and ideas for further research conclude this chapter.

Literature

The research question that was the main focus in the literature review is: *What are the most important drivers and barriers for sustainability in the supporting activities of an organization?* As there is no literature on D&B for sustainability specifically focused on the SA of an organization, the D&B for sustainability regarding organizations in general were identified. This resulted in nine categories of drivers, including: costs; management support; government; awareness; technology; competition; reputation; demand or pressure from external parties; and intrinsic motivation. Eleven categories of barriers were identified, including: costs; management support; government; awareness; technology; knowledge. skill and information; time; support from employee or partners; competition; risk; and intrinsic motivation. Above mentioned categories include the most important D&B for sustainability in organizations, forming part of the theoretical framework for the case study.

Methodology

The second sub-question, focusing on the methodology of the research, is: *How can be established how the process of enhancing sustainability in the supporting activities within an organization takes place?* To understand how an organization enhances sustainability, a case study was performed. The case study consisted of eight initiatives for enhancing sustainability within one case company. The D&B for sustainability in organizations form the theoretical framework for the case study, as these were the most important factors that played a role in motivating and hindering transitions regarding sustainability. Within the case study a process research method was used, to create an understanding of the processes of sustainability initiatives. The processes were mapped through interactive interviews and collecting relevant documentation. The process maps gave the insight to understand the decision-making processes, which were analyzed using the streams model. Through this analysis, the WOO were identified, giving insight in what led to decisions, and possible TP could be identified to see whether decisions led to big transitions. This method created an understanding of the process of enhancing sustainability within an organization, with the related D&B that played a role in the process.

Results

The third sub-question, looking into the results of the case study, is: *How is sustainability enhanced in the supporting activities of an Engineering Consultant Organization?* The case study resulted in eight mapped processes, in which decision-making streams, WOO and TP were identified. The use of the streams model as mode of analysis split up the decision-making process, identifying the most important problems, solutions and stakeholders. In most cases, the problem stream comprised reducing the CO2 emissions. The solutions involved technical innovations and new policies. The participant stream in most cases included the services team from RHDHV's SA and the management of RHDHV. There were some individuals within the services team who were paramount in the process of cases, who's intrinsic motivation for sustainability played a big role in the success of the case.

Analyzing the coupling of the streams made it possible to identify the WOO. The main WOO that were identified involve problems becoming more pressing, through raised awareness or through an event that put more attention to a certain problem. Also, it was more than once a combination of several events that formed the coupling of the streams. Decisions that were made, as a result of streams being coupled and through WOO that opened, could have led to TP in the processes. However, when looking at the definition and the characteristics of a TP in literature, no convincing TP occurred within the cases.

The occurrence of D&B, that were identified from literature and formed the theoretical framework for the data collection, was also analyzed. This led to the insight that the drivers awareness and intrinsic motivation were important in the majority of the cases, and barriers costs, the lack of support from employees or partners and the lack of intrinsic motivation were most common.

Through these analyses, different patterns could be identified, and observations could be made. There were four most striking observations selected, of which the first and most occurring observation is intrinsic motivation from individuals within the case as an important driver; The second observation is that of trends or external events being connected to; The third observation involves changes that are already planned to take place, or that for decisions that already needed to be made, the sustainable alternative was chosen; The fourth observation is a lack of vision and priorities regarding sustainability, which is also related to the barrier category intrinsic motivation. Some cases included more than one of the striking observations, such as the case of waste management, whereas others only contained one pattern, such as the case of electrical lease cars.

Related to the fourth observation that was identified, an integral perspective for sustainability within the organization is missing. RHDHV wants to be a frontrunner regarding sustainability within their organization, under the motto of 'practice what you preach'. This study discussed that RHDHV connects to initiatives that occur outside of the organization and implements these in some version within the organization. Already needed changes, such as the new waste bins, are used as an opportunity to implement sustainability by choosing sustainable alternatives. It can be argued whether the current path is the way towards reaching the sustainability goals, and if this is what being a frontrunner is. Some of the cases following the current strategy are successful, however this does not seem like an integral approach in which the goal of being a frontrunner in sustainability will be achieved. It seems that within the cases difficult decisions were not made. Related to this, no clear TP appeared in the cases. It can be concluded that only low hanging fruit is picked, because no really exciting or difficult choices are made. This seemed to be a case of 'no pain, no gain' whereas transition supposed to cause 'pain' and when no pain is experienced, there might be not sufficient change taking place to reach the goal.

Discussion

The implications of this study for research and practice were discussed in chapter 5, in which the focus was on the sub-question: *How can the findings of the case study contribute to enhance sustainability in supporting activities of Engineering Consultant Organizations?* The contribution of this study for theory is that this research offers another perspective on D&B than to date is researched, as they are related to DMT, WOO and TP. This research questions the logic of the streams and the applicability of TP within the context of organizations.

The implications regarding practice involve the specific lessons learned from the case study, implying specific D&B being more common. Adding to this, the most striking observations that were made in the case study could be seen as lessons learned, of which the applicability within other organizations can be researched. Also, this research is transferable to other organizations, by applying the methodology of mapping the process; understanding the streams, WOO and possible TP; and relating these findings to the D&B for sustainability from literature.

Main research question

The main research question of this study is: *What are the defining moments in the enhancement of sustainability in the SA of an engineering consultant organization?* The answer to this main research question can be divided into three parts.

The first part of the answer involves the found observations of the case study, as these form the defining moments. This research has looked into one organization in which sustainability has been enhanced. This case study has led to four main observations within the processes of enhancing sustainability in SA. The observations itself can help engineering consultant organizations to enhance sustainability in their SA. Looking at the striking observations, the motivation of individuals for sustainability within the organization plays an important role. Also, external events regarding sustainability or trends can be used to implement certain sustainability initiatives. Low hanging fruit regarding sustainability can be 'picked' by using plans that were already going to be executed to push sustainable alternatives. Adding to this, a vision and integral strategy for sustainability is an important factor forming the intrinsic motivation of the organization.

The second part of the answer comprises the conclusions and recommendations following the defining moments. Recommendations that follow from the first striking observation is to create an environment in which individuals that are motivated to enhance sustainability can thrive. The individuals should have the opportunity to proceed their ideas regarding sustainability, by for example an open and innovative environment. Regarding the second observation, it is recommended to make use of external events and trends, but to not let these external occurrences determine the path towards sustainability. The third striking observation involves implementing sustainable alternatives in changes that were already lined up. Regarding this observation, the recommendation is similar to the one from the second observation Namely, to make use of these openings, but to not let these determine the course towards sustainability. Apart from these trends, external events and already lined up changes, a strategy for sustainability specifically for the SA of an organization is needed. This relates to the fourth observation, for which the recommendation is to develop clear goals and a strategy for sustainability in the SA, for a more integral approach.

The third part of the answer involves the methodology of this research. Organizations can create insight in their specific situation regarding the enhancement of sustainability through applying the methodology of this research. This has to main goal to create an understanding of the processes within their SA. Through analysing the processes using the streams model, the WOO and possible TP can be identified. By this methodology, the D&B for sustainability within an organization can not only be identified, but also better understood too.

Recommendations

The recommendations are split up into recommendations for the engineering consultant organization of the case study and recommendations for future research on this topic. There are three recommendations for the engineering consultant organization that formed the case study.

The first recommendation is to promote the integrality of sustainability initiatives and projects, which leads to bigger steps forward. In the current processes, the responsibility for sustainability within the organization is spread, which in some cases led to unclarity who to turn to for what. A recommendation is for example to assign one responsible director or manager for sustainability within the organization, who is solely responsible for the sustainability performance of the organization itself.

The second recommendation is to develop a strategy for sustainability specifically for the SA, including a clear vision and goals. In such a way, future trends are adapted within the strategy, but these trends than do not determine the course of the progress towards being a frontrunner in sustainability.

The third recommendation is to create an environment in which there is room and space for ideas regarding sustainability within the organization. The intrinsic motivation within the cases has turned out the be an important driver for sustainability, so this should be strengthened. Individuals who are intrinsically motivated for sustainability can in this way be stimulated to start or further work out sustainable initiatives.

For future research, it could be interesting to look at organizations from another sector enhancing sustainability in their SA, using the same methodology. It would be interesting to see whether the implications for the engineering consultant organizations also hold in other sectors. Another recommendation for further research involves the used model for analysis of the processes. In this research was chosen to make use of only the streams model. However, there were two more models for analysis of decision-making processes. It could be interesting to research a similar process towards sustainability in an organization using the rounds or phase model.

7. Literature List

Baumgartner, R. J., & Rauter, R. (2017). Strategic perspectives of corporate sustainability management to develop a sustainable organization. *Journal of cleaner production, 140*, 81-92.

Béland, D. (2016). Kingdon reconsidered: ideas, interests and institutions in comparative policy analysis. *Journal of Comparative Policy Analysis: Research and Practice, 18*(3), 228-242.

Bennet, A., & Bennet, D. (2008). The Decision-Making Process for Complex Situations in a Complex Environment, First chapter in Burstein, F. and Holsapple, CW. *Handbook on Decision Support Systems*.

Bhanot, N., Rao, P. V., & Deshmukh, S. (2017). An integrated approach for analysing the enablers and barriers of sustainable manufacturing. *Journal of cleaner production, 142*, 4412-4439.

Birkmann, J., Buckle, P., Jaeger, J., Pelling, M., Setiadi, N., Garschagen, M., . . . Kropp, J. (2010). Extreme events and disasters: a window of opportunity for change? Analysis of organizational, institutional and political changes, formal and informal responses after mega-disasters. *Natural hazards, 55*(3), 637-655.

Blaikie, N. (2007). *Approaches to social enquiry: Advancing knowledge*: Polity.

Cairney, P. (2018). Three habits of successful policy entrepreneurs. *Policy & Politics, 46*(2), 199-215.

Cakmak, E., & Cakmak, P. I. (2014). An analysis of causes of disputes in the construction industry using analytical network process. *Procedia-Social and Behavioral Sciences, 109*, 183-187.

Caldera, H., Desha, C., & Dawes, L. (2019). Evaluating the enablers and barriers for successful implementation of sustainable business practice in 'lean'SMEs. *Journal of cleaner production, 218*, 575-590.

Cohen, M. D., March, J. G., & Olsen, J. P. (1972). A garbage can model of organizational choice. *Administrative science quarterly*, 1-25.

Collin, C., Linnet, A., & Secher, A. Q. (2018). Life Cycle Engineering from the Perspective of an Engineering Consultancy. *Procedia CIRP, 69*, 49-53.

Cox, R. H., & Béland, D. (2013). Valence, policy ideas, and the rise of sustainability. *Governance, 26*(2), 307-328.

Cumming, K., & Findlay, C. (2010). Digital recordkeeping: are we at a tipping point? *Records Management Journal*.

Cushman, M., Cornford, T., & Venters, W. (2005). Knowledge about sustainability: SSM as a method for conceptualising the UK construction industry's knowledge environment. *Journal of computing and information technology, 13*(2), 137-148.

Daddi, T., Ceglia, D., Bianchi, G., & de Barcellos, M. D. (2019). Paradoxical tensions and corporate sustainability: A focus on circular economy business cases. *Corporate Social Responsibility and Environmental Management*.

Daft, R. L., & Lane, P. G. (2007). *Understanding the theory and design of organizations*: Thomson South-Western Mason, OH.

De Jesus, A., & Mendonça, S. (2018). Lost in transition? Drivers and barriers in the eco-innovation road to the circular economy. *Ecological economics, 145*, 75-89.

de Paula, N., Arditi, D., & Melhado, S. (2017). Managing sustainability efforts in building design, construction, consulting, and facility management firms. *Engineering, Construction and Architectural Management, 24*(6), 1040-1050.

Domingues, A. R., Lozano, R., Ceulemans, K., & Ramos, T. B. (2017). Sustainability reporting in public sector organisations: Exploring the relation between the reporting process and organisational change management for sustainability. *Journal of environmental management, 192*, 292-301.

Draft National Climate Agreement - The Netherlands. (2019). The Hague Retrieved from https://www.klimaatakkoord.nl/documenten/publicaties/2019/06/28/national-climate-agreement-the-netherlands

Engert, S., Rauter, R., & Baumgartner, R. J. (2016). Exploring the integration of corporate sustainability into strategic management: a literature review. *Journal of cleaner production, 112*, 2833-2850.

Epstein, M. J., & Roy, M.-J. (2001). Sustainability in action: Identifying and measuring the key performance drivers. *Long range planning, 34*(5), 585-604.

Fouqueray, T., Charpentier, A., Trommetter, M., & Frascaria-Lacoste, N. (2020). The calm before the storm: How climate change drives forestry evolutions. *Forest Ecology and Management, 460*, 117880.

Gabriel, Y., & Griffiths, D. S. (2004). Stories in Organizational Research. In C. Cassell & G. Symon (Eds.), *Essential guide to qualitative methods in organizational research* (pp. 114-126): Sage.

Garmestani, A. S. (2014). Sustainability science: accounting for nonlinear dynamics in policy and social–ecological systems. *Clean Technologies and Environmental Policy, 16*(4), 731-738.

Giunipero, L. C., Hooker, R. E., & Denslow, D. (2012). Purchasing and supply management sustainability: Drivers and barriers. *Journal of Purchasing and Supply Management, 18*(4), 258-269.
Grin, J., Rotmans, J., & Schot, J. (2010). *Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change*: Taylor & Francis.
Guldbrandsson, K., & Fossum, B. (2009). An exploration of the theoretical concepts policy windows and policy entrepreneurs at the Swedish public health arena. *Health promotion international, 24*(4), 434-444.
Hahn, T., Pinkse, J., Preuss, L., & Figge, F. (2015). Tensions in corporate sustainability: Towards an integrative framework. *Journal of Business Ethics, 127*(2), 297-316.
Jaffee, D. (2001). *Organization theory: Tension and change*: McGraw-Hill Humanities, Social Sciences & World Languages.
Kim, W. C., & Mauborgne, R. (2003). Tipping point leadership. *Harvard business review, 81*(4), 60-69.
King, N. (2004). Using Interviews in Qualitative Research Essential guide to qualitative methods in organizational research. In C. Cassell & G. Symon (Eds.), *Essential guide to qualitative methods in organizational research* (pp. 11-22): Sage.
King, N., & Horrocks, C. (2010). *Interviews in Qualitative Research*: SAGE Publications.
Kingdon, J. W. (2013). *Agendas, Alternatives, and Public Policies, Update Edition, with an Epilogue on Health Care: Pearson New International Edition*: Pearson Education Limited.
Kiron, D., Kruschwitz, N., Haanaes, K., & von Streng Velken, I. (2012). Sustainability nears a tipping point. *MIT Sloan Management Review, 53*(2), 69-74.
Knaggård, Å. (2015). The multiple streams framework and the problem broker. *European Journal of Political Research, 54*(3), 450-465.
Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners*: Sage Publications Limited.
Kutz, M. (2018). *Handbook of Environmental Engineering*: John Wiley & Sons.
Laftchiev, E., & Liu, Y. (2018). *Finding multidimensional patterns in multidimensional time series.* Paper presented at the KDD workshop on MiLeTS '18, London.
Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management review, 24*(4), 691-710.
Large, R. O., & Thomsen, C. G. (2011). Drivers of green supply management performance: Evidence from Germany. *Journal of Purchasing and Supply Management, 17*(3), 176-184.
Linnenluecke, M. K., Russell, S. V., & Griffiths, A. (2009). Subcultures and sustainability practices: The impact on understanding corporate sustainability. *Business Strategy and the Environment, 18*(7), 432-452.
Lozano, R. (2015). A holistic perspective on corporate sustainability drivers. *Corporate Social Responsibility and Environmental Management, 22*(1), 32-44.
Lozano, R. (2018). Proposing a definition and a framework of organisational sustainability: a review of efforts and a survey of approaches to change. *Sustainability, 10*(4), 1157.
Lozano, R., Nummert, B., & Ceulemans, K. (2016). Elucidating the relationship between sustainability reporting and organisational change management for sustainability. *Journal of cleaner production, 125*, 168-188.
Lozano, R., Suzuki, M., Carpenter, A., & Tyunina, O. (2017). An analysis of the contribution of Japanese business terms to corporate sustainability: Learnings from the "looking-glass" of the East. *Sustainability, 9*(2), 188.
Lozano, R., & von Haartman, R. (2018). Reinforcing the holistic perspective of sustainability: analysis of the importance of sustainability drivers in organizations. *Corporate Social Responsibility and Environmental Management, 25*(4), 508-522.
Lu, Y., & Zhang, X. (2016). Corporate sustainability for architecture engineering and construction (AEC) organizations: Framework, transition and implication strategies. *Ecological indicators, 61*, 911-922.
Maletič, M., Maletič, D., & Gomišček, B. (2018). The role of contingency factors on the relationship between sustainability practices and organizational performance. *Journal of cleaner production, 171*, 423-433.
Milkoreit, M., Hodbod, J., Baggio, J., Benessaiah, K., Calderón-Contreras, R., Donges, J. F., . . . Werners, S. E. (2018). Defining tipping points for social-ecological systems scholarship—an interdisciplinary literature review. *Environmental Research Letters, 13*(3), 033005.
Mintzberg, H. (1979). *The Structuring of Organizations: A Synthesis of the Research*: Prentice-Hall.
Mintzberg, H. (1993). *Structure in fives: Designing effective organizations*: Prentice-Hall, Inc.
Moser, S. C., & Dilling, L. (2007). Toward the social tipping point: Creating a climate for change. *Creating a climate for change: Communicating climate change and facilitating social change*, 491-516.
Muduli, K., Govindan, K., Barve, A., & Geng, Y. (2013). Barriers to green supply chain management in Indian mining industries: a graph theoretic approach. *Journal of cleaner production, 47*, 335-344.

Orji, I. J. (2019). Examining barriers to organizational change for sustainability and drivers of sustainable performance in the metal manufacturing industry. *Resources, Conservation and Recycling, 140*, 102-114.
Ortiz, O., Castells, F., & Sonnemann, G. (2009). Sustainability in the construction industry: A review of recent developments based on LCA. *Construction and building materials, 23*(1), 28-39.
Peters, P., Bruijn, T. d., Bakker, A., & van der Heijden, B. (2011). Plezier in het nieuwe werken?
Pilbeam, S., & Corbridge, M. (2006). *People Resourcing: Contemporary HRM in Practice*: Financial Times/Prentice Hall.
Poole, M. S., Van de Ven, A. H., Dooley, K., & Holmes, M. E. (2000). *Organizational change and innovation processes: Theory and methods for research*: Oxford University Press.
Porter, M. E. (2011). *Competitive advantage of nations: creating and sustaining superior performance*: simon and schuster.
Prorail draagt succesvolle CO2 prestatieladder over. (2011). Retrieved from https://www.duurzaam-ondernemen.nl/prorail-draagt-succesvolle-co2prestatieladder-over/
Ramirez, R., Selsky, J. W., & Van der Heijden, K. (2010). *Business planning for turbulent times: new methods for applying scenarios*: Routledge.
RHDHV. (2020). Mission Retrieved from https://www.royalhaskoningdhv.com/en-gb/about-us/our-values
Rizos, V., Behrens, A., Van Der Gaast, W., Hofman, E., Ioannou, A., Kafyeke, T., . . . Hirschnitz-Garbers, M. (2016). Implementation of circular economy business models by small and medium-sized enterprises (SMEs): Barriers and enablers. *Sustainability, 8*(11), 1212.
Rogers, E. (1983). Diffusion of innovations. In: The free press.
Scheffer, M. (2010). Foreseeing tipping points. *Nature, 467*(7314), 411-412.
Scheffer, M., Carpenter, S. R., Lenton, T. M., Bascompte, J., Brock, W., Dakos, V., . . . Van Nes, E. H. (2012). Anticipating critical transitions. *science, 338*(6105), 344-348.
Seidel, S., Recker, J. C., Pimmer, C., & vom Brocke, J. (2010). *Enablers and barriers to the organizational adoption of sustainable business practices.* Paper presented at the Proceeding of the 16th Americas conference on information systems: sustainable IT collaboration around the globe.
Shapiro, A. (2010). *Creating contagious commitment: Applying the tipping point to organizational change*: Strategy Perspective.
Simoni, M., & Hofmann, M. C. (2020). The COVID-19 pandemics: shall we expect andrological consequences? A call for contributions to ANDROLOGY. *Andrology*.
Stel, R. (2019). *Towards sustainable projects: A research into the reasons influencing the integration of sustainability aspects into projects within the engineering sector.* Retrieved from http://resolver.tudelft.nl/uuid:d8bdff31-122e-42f0-86ac-766eb9320426
Stewart, R., Bey, N., & Boks, C. (2016). Exploration of the barriers to implementing different types of sustainability approaches. *Procedia CIRP, 48*, 22-27.
Støre-Valen, M., & Buser, M. (2019). Implementing sustainable facility management: Challenges and barriers encountered by Scandinavian FM practitioners. *Facilities*.
Teisman, G. R. (2000). Models for research into decision-makingprocesses: on phases, streams and decision-making rounds. *Public administration, 78*(4), 937-956.
Thompson, R., & Green, W. (2005). When sustainability is not a priority. *International Journal of Sustainability in Higher Education*.
Tipping point. Retrieved from https://www.forbes.com/sites/uhenergy/2017/03/16/have-we-passed-the-climate-change-tipping-point/#3ebdd6237e12
Tolbert, P. S., & Hall, R. H. (2015). *Organizations: Structures, processes and outcomes*: Routledge.
Tura, N., Hanski, J., Ahola, T., Ståhle, M., Piiparinen, S., & Valkokari, P. (2019). Unlocking circular business: a framework of barriers and drivers. *Journal of cleaner production, 212*, 90-98.
Van de Ven, A. H. (2007). *Engaged scholarship: A guide for organizational and social research*: Oxford University Press on Demand.
Verschuren, P., Doorewaard, H., & Mellion, M. (2010). *Designing a research project* (Vol. 2): Eleven International Publishing The Hague.
Walker, H., Di Sisto, L., & McBain, D. (2008). Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. *Journal of Purchasing and Supply Management, 14*(1), 69-85.
Westbrook, L. (1994). Qualitative research methods: A review of major stages, data analysis techniques, and quality controls. *Library & information science research, 16*(3), 241-254.
Whittington, R. (2001). *What is strategy-and does it matter?* : Cengage Learning EMEA.

Witjes, S., & Lozano, R. (2016). Towards a more Circular Economy: Proposing a framework linking sustainable public procurement and sustainable business models. *Resources, Conservation and Recycling, 112*, 37-44.

Yazan, B. (2015). Three approaches to case study methods in education: Yin, Merriam, and Stake. *The qualitative report, 20*(2), 134-152.

Yin, R. K. (2009). *Case Study Research: Design and Methods*: SAGE Publications.

Zuidema, J. (2020). *Jaarrapportage CO2 prestatieladder*. Retrieved from https://www.royalhaskoningdhv.com/-/media/royalhaskoningdhvcorporate/files/global/about-us/corporate-responsibility/co2-prestatieladder/1a2--2a1-rhdhv-jaarrapportage-co2-prestatieladder-2019-final.pdf?la=en-gb

Appendices

A. Drivers and Barriers for sustainability

Author	Title	Description
Orji (2019)	Examining barriers to organizational change for sustainability and drivers of sustainable performance in the metal manufacturing industry	Identified barriers and drivers in regard to change towards sustainability in organizations in the Chinese metal industry, sourced from relevant literature and then selected based on literature and expert views.
Lozano and von Haartman (2018)	Reinforcing the Holistic Perspective of Sustainability: Analysis of the Importance of Sustainability Drivers in Organizations	Ranking of the most important drivers for change management in organizations for sustainability.
Stewart et al. (2016)	Exploration of the barriers to implementing different types of sustainability approaches	Barriers to implementing long-lasting sustainability approaches in companies.
Engert et al. (2016)	Exploring the integration of corporate sustainability into strategic management: a literature review	Exploration of the integration of CS into strategic management, resulting in internal and external drivers, and factors supporting or hindering the integration of CS into strategic management.
Tura et al. (2019)	Unlocking circular business: A framework of barriers and drivers	Introduction of a framework of drivers supporting new business concepts for circular economy and drivers hindering innovation in organizations.
Lozano (2015)	A Holistic Perspective on Corporate Sustainability Drivers	Study on the drivers for change in large corporations towards sustainability, focusing not only on internal and external perspectives, but finding a more holistic perspective.

Table 13: Overview relevant literature for drivers and barriers for sustainability in organizations.

	Category	Drivers	Sources
D1	Costs	Financial Benefits, Cost Reduction, Subsidy, Funds	(Engert et al., 2016; Epstein & Roy, 2001; Giunipero et al., 2012; Lozano, 2015; Lozano & von Haartman, 2018; Orji, 2019; Tura et al., 2019; Walker et al., 2008)
D2	Management Support	Support from Management, Proactive Leadership	(Epstein & Roy, 2001; Giunipero et al., 2012; Lozano, 2015; Lozano & von Haartman, 2018; Walker et al., 2008)
D3	Government	Regulations, Legislations, Policies	(Domingues et al., 2017; Epstein & Roy, 2001; Giunipero et al., 2012; Lozano, 2015; Lozano & von Haartman, 2018; Orji, 2019; Tura et al., 2019; Walker et al., 2008)
D4	Awareness	Raising Awareness	(Lozano, 2015; Lozano & von Haartman, 2018; Orji, 2019; Tura et al., 2019)
D5	Technology	Innovation, New Technologies	(Engert et al., 2016; Lozano, 2015; Tura et al., 2019)
D6	Competition	Market Position, Competitive Advantage	(Engert et al., 2016; Epstein & Roy, 2001; Giunipero et al., 2012; Lozano, 2015; Lozano & von Haartman, 2018; Tura et al., 2019; Walker et al., 2008)
D7	Reputation	Reputation of Company, Press	(Engert et al., 2016; Lozano, 2015; Lozano & von Haartman, 2018)
D8	Demand/Pressure External Parties	Peer Pressure, Market Demand, Customer Demand	(Domingues et al., 2017; Epstein & Roy, 2001; Giunipero et al., 2012; Large & Thomsen, 2011; Lozano, 2015; Lozano & von Haartman, 2018; Walker et al., 2008)
D9	Intrinsic Motivation	Culture of Company, Moral/Ethical Obligation	(Domingues et al., 2017; Engert et al., 2016; Large & Thomsen, 2011; Lozano, 2015; Lozano & von Haartman, 2018)

Table 14: Overview of drivers.

	Category	Barriers	Sources
B1	Costs	High Costs, Lack of Financial Resources	(Bhanot, Rao, & Deshmukh, 2017; Caldera et al., 2019; Giunipero et al., 2012; Orji, 2019; Rizos et al., 2016; Stewart et al., 2016; Tura et al., 2019; Walker et al., 2008)
B2	Management Support	Lack of Managementsupport	(Bhanot et al., 2017; Caldera et al., 2019; Domingues et al., 2017; Giunipero et al., 2012; Orji, 2019; Stewart et al., 2016; Tura et al., 2019)
B3	Government	Inefficient Legal Framework: Limiting, Unclear, Lack Support	(Bhanot et al., 2017; Caldera et al., 2019; Domingues et al., 2017; Giunipero et al., 2012; Muduli et al., 2013; Orji, 2019; Rizos et al., 2016; Stewart et al., 2016; Tura et al., 2019; Walker et al., 2008)
B4	Awareness	Lack of Awareness	(Bhanot et al., 2017; Caldera et al., 2019; Orji, 2019; Stewart et al., 2016)
B5	Technology	Lack or Inefficiency of Technology	(Orji, 2019; Rizos et al., 2016; Stewart et al., 2016; Tura et al., 2019)
B6	Knowlegde, Skill and Information	Lack of Knowledge, Skill and Information within Company	(Bhanot et al., 2017; Caldera et al., 2019; Domingues et al., 2017; Muduli et al., 2013; Orji, 2019; Rizos et al., 2016; Stewart et al., 2016; Tura et al., 2019; Walker et al., 2008)
B7	Time	Time Consuming	(Bhanot et al., 2017; Muduli et al., 2013; Stewart et al., 2016)
B8	Support (Employee/Partner)	Lack of Support from Employees and Network, Negative Attitudes	(Bhanot et al., 2017; Rizos et al., 2016; Stewart et al., 2016; Tura et al., 2019)
B9	Competition	Unwillingness to share Information, Low Competitiveness	(Stewart et al., 2016; Walker et al., 2008)
B10	Risk	Lack of Risk Management Methods, High Financial Risk due to Company Size, Fear of Competitors Taking Advantage	(Bhanot et al., 2017; Caldera et al., 2019; Stewart et al., 2016; Tura et al., 2019)
B11	Intrinsic Motivation	Lack of Vision, Priority, Incentives	(Bhanot et al., 2017; Stewart et al., 2016; Tura et al., 2019)

Table 15: Overview of barriers.

B. Interview Protocol

Case: …
Short description of the case: …
Role of interviewee:

- What is your role within RHDHV?
- What was your role in the case?
- Which part of the organization was (mainly) involved in the case? (to create first understanding of the perspective)

Explanation of card-system: During this interview we are going to (re)construct the timeline of the case, with the most important moments that decided the course of the project, in order to create an understanding of the process of the project. I will ask questions about the project, through which we will together identify the important moments and for these important moments you will take a card and describe the moment through keywords and place it in chronological order on the table before you.

Interview in 5 steps: In the first step an event is established, this will be established through asking different questions for every phase. The event will be written down on a card. In the second step a position for the card within the timeline on the table is established. In the third step more in depth questions on each event will create a better understanding of the event. The drivers and barriers from literature will not be explicitly mentioned here, in order not to bias the interviewee, and to come up with the most important aspects themselves. The idea in this step is to establish what the most important drivers and barriers were in the different events. In the fourth step the perspective of the event will be established, using Mintzberg's model for different parts of the organization.

1. Establish important event, by asking questions such as:
    a. Initiation phase:
        i. When did the project start? or When was the first moment you heard about the project or about the idea for this project? or When did you get involved with the project?
        ii. Where did the idea come from? or By who was the project initiated? Was the initiation internal or external?
        iii. What already happened before you heard about the project?
        iv. Was research conducted on the idea in the initiation phase? By who? What was the outcome?
        v. Were there external events that influenced the course of the initiation phase?
    b. Development phase:
        i. How did the development of the project go? What were the most important moments within this?
        ii. How was decided to continue with the project? By who? On the basis of what was the project continued, or stopped?
        iii. Who decided what the project exactly looked like? Who designed/developed the project?
        iv. Were there external events that influenced the course of the development phase? Did other events or decisions influence what the project looked like?
    c. Execution phase:
        i. Can you tell me how the execution/implementation of the project went?
        ii. When was started with the implementation of the project?
        iii. Who made the decision to start with the execution?
        iv. Was there a test period, or pilot project before implementation?
        v. Did the execution go as planned? What were the setbacks?

vi. How was the project received by the employees of RHDHV?

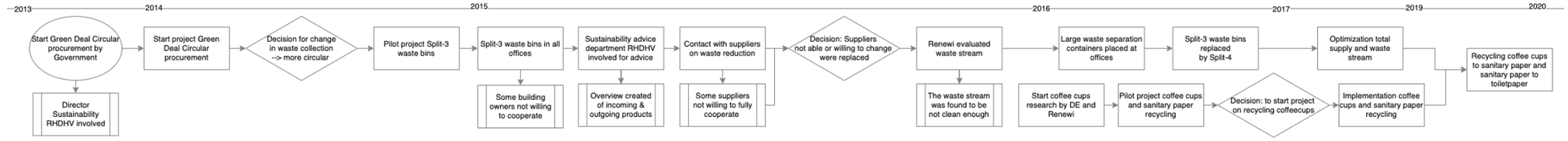
2. Establish place in timeline, by asking questions such as:
    a. When did it take place?
    b. What happened just before and just after?
3. Identify meaning, by asking additional questions such as:
    a. What exactly happened? or Can you explain a little more about the event?
    b. Why did this happen?
    c. What caused this to happen?
    d. What was the result?
    e. What was difficult within the event? or Were there any setbacks?
4. Identify perspective (Mintzberg), by asking questions such as:
    a. Who were involved in the event?
    b. Who were the most important stakeholders in the project?
    c. Who made the decision?
    d. Which part of the organization was involved?
    e. Were there external or only internal people involved?

The fifth step, in order not to miss any important factors: As the end of the hour is approaching, the interviewer might intervene by asking about the drivers and barriers from literature directly, whether they have played a role within the case and in what way.

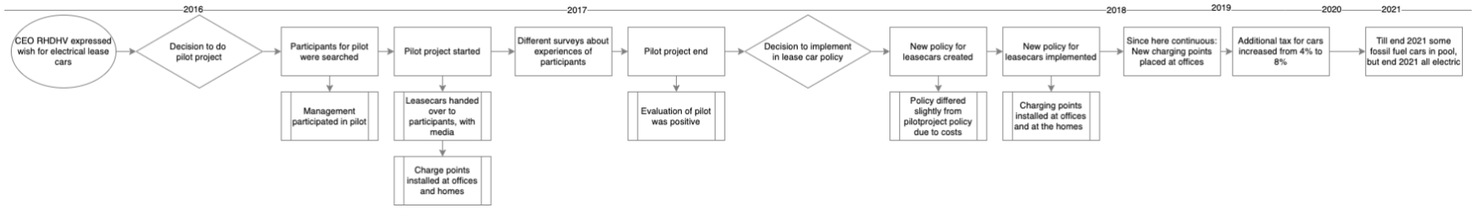
5. To understand the role within the case of important drivers and barriers from literature:
    a. What role did … play within the project? (costs, technology, knowledge, awareness, risk, time)
    b. Did … play a role in the project?
    c. Was the project supported within/outside the organization? (management support, support of employees/clients/stakeholders, government, peer pressure)
    d. What was the reaction to the project? (competition, support, press, employees)

C. Process maps

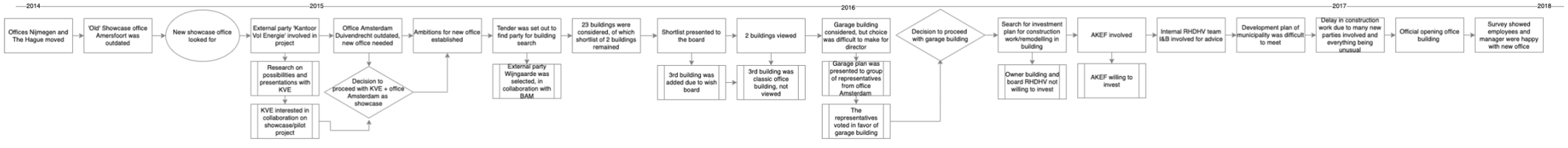
C1. Waste management



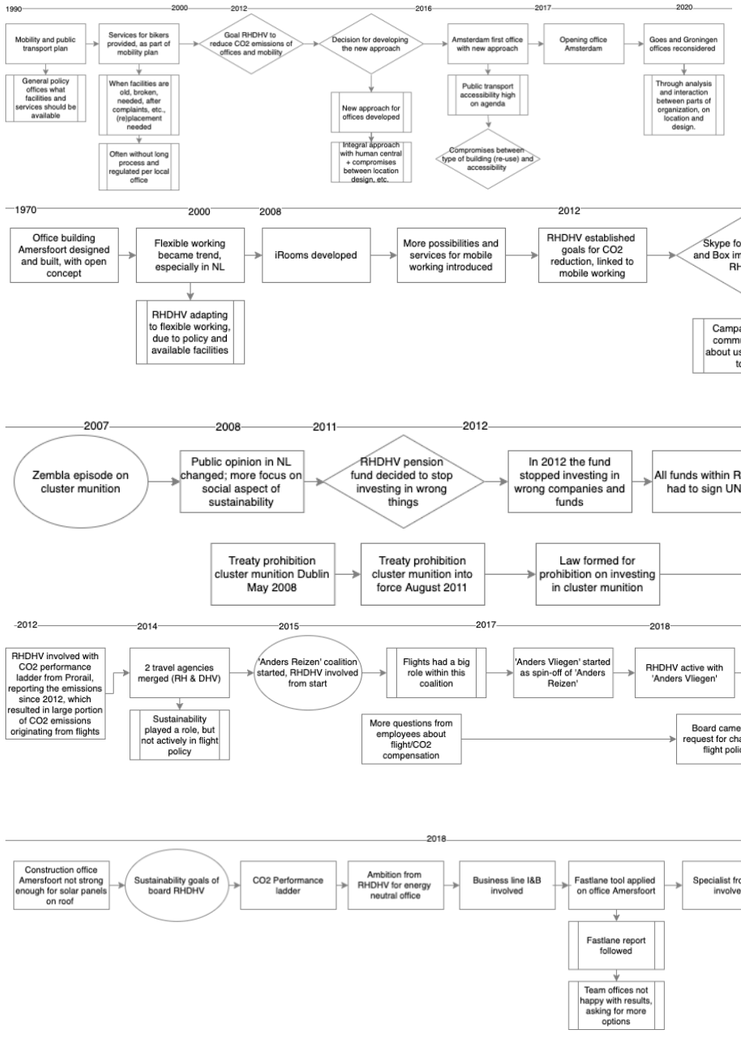
C2. Electrical lease cars



C3. Office Amsterdam

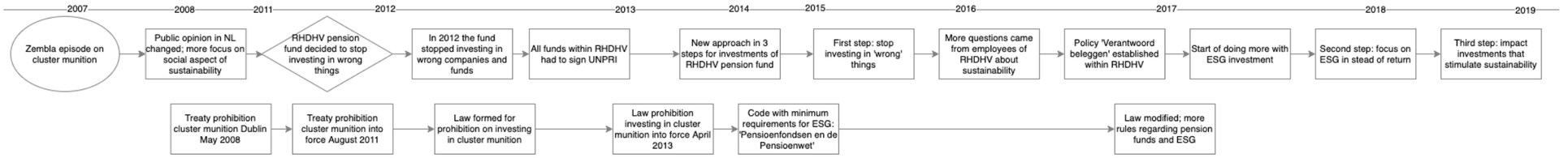


C4. Location management

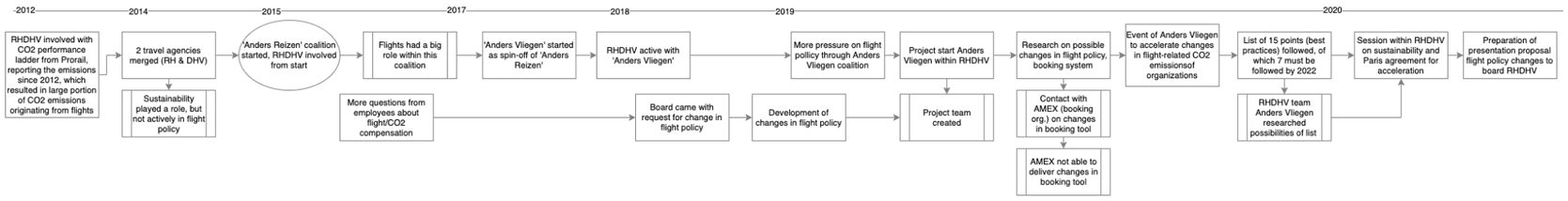


C5. Mobile working facilities

C6. Pension fund RHDHV



C7. Business flights



C8. Solar panels office Amersfoort