A Stepping Stone to Enhance Competitiveness through Sustainable Development

A preliminary design for prioritizing between sustainable development activities to enhance the competitiveness of Dutch real estate developers.

Pim P. Lambert

MSc. Architecture, Urbanism, and Building Sciences
Management in the Built Environment

P5

01-07-2021

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"…more and more corporations in every industry are incorporating sustainability and social responsibility issues into their goals for the future. They have accepted that they must do so if they wish to survive and thrive in the tumultuous times ahead."

(Senge, Smith, Kruschwitz, Laur, & Schley, 2010, p. 101)

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Student info:

Name:	Pim Lambert
Student number:	4988531
Institution	TU Delft
Master:	MSc Architecture, Urbanism and Building Sciences
Master track:	Management in the Built Environment
Graduation lab	UDM – Urban Development Management

Mentors:

1st Mentor	Dr.ir. E.W.T.M. (Erwin) Heurkens
2nd Mentor	Ing. P. (Peter) de Jong

Graduation Organization

Organization	NEOO
Type of organization	Real estate developer
Location	A.J. Ernststraat 595-E, Amsterdam
e-mail:	info@neoo.nl

NEOO
SHAPING DEVELOPMENTS

Preface

Before you lies my master thesis discussing the impact of obtaining a sustainable corporate strategy on the competitiveness of Dutch real estate developers. There were a multitude of reasons why I chose this topic. First, my growing interest in real estate development. Before starting my studies at the Technical University of Delft I worked as a planner for a contractor. It was here that I realized I had a desire to work in the earlier stages of real estate projects, preferably in the development phases. For this reason I transitioned back to studying and starting working part time for a real estate developer. My earlier interest in real estate development was confirmed, and therefore I chose to pursue a career in this field. Second, my growing interest towards the topic of sustainability. In our studies sustainability is a broadly discussed topic, yet in practice I had the impression that the implementation, apart from the awareness, of sustainability was sometimes lacking. I found this interesting because certain real estate developers were using sustainability as one of their main pillars as a firm and becoming successful in doing so. Therefore I decided to dedicate my thesis towards combining these interests.

Also, it can no longer be ignored that our environment finds itself in vulnerable state and that the real estate sector is making a significant contribution to this problem. Even though this thesis is focused on the competitiveness gained through sustainability, I hope it will contribute to changing the perspective towards sustainability and motivate real estate developers to start obtaining a more sustainable corporate strategy. I am a strong believer that proactively operating in a sustainable manner in the real estate industry is becoming a must for environmental, social, and economic reasons.

The end result of this thesis could not have been achieved without the help of others. I would like to take this opportunity to thank my mentors Erwin Heurkens and Peter de Jong from the TU Delft for the inspiring, critical, and motivational feedback given throughout the process. Secondly, I would also like to thank the firm who also supported me throughout the process, NEOO, especially Peter Horst and Arjen Seckel. Their support and critical view from practice allowed me to gain a much better understanding of the way real estate developers operate. Lastly, I would like to thanks all the participants that allowed me to gain the data needed to write this thesis. The survey, interviews, and focus group have given me an incredible amount of new insight towards this topic.

Pim P. Lambert
July 2021

Executive Summary

Introduction

The necessity for sustainable solutions can no longer be ignored in today's environment. The built environment generating nearly 40% of global energy consumption and approximately one-third of global CO_2 emissions (JLL, 2020), also needs to start operating in a more sustainable manner. As indicated by Annemarie van Doorn, director of the Dutch Green Building Council, the problems concerning sustainability need to be answered now and the transition towards a more sustainable built environment is something that cannot wait any longer (Vastgoed Journaal, 2020). Moreover, Senge et al. (2010), indicate that an increasing amount of firms are acting in a sustainable manner because they have accepted that they must do so to thrive or even survive as an organization.

This contextual pressure is recognized in the Dutch real estate development sector as well and originates from different sources. Some examples of this are legislation through BENG and the Paris agreement, a rise in demand for sustainable solutions throughout the real estate industry (JLL, 2020; JLL, 2019; CBRE Research, 2020), an increasing momentum of the sustainability trend (Deloitte, 2020), and investors now seeing it as a risk not to engage in sustainable investments at all (Deloitte, 2020).

Even though the need to innovate and develop is being realized by Dutch real estate developers (Haak & Heurkens, 2015), the pace at which the built environment is transitioning to become a more sustainable sector is considered to be too slow (Haak & Heurkens, 2015; Heurkens, 2017; Van der Heijden, 2017). Real estate developers are being held back by a multitude of barriers to become more sustainable of which the financials barriers form the greatest obstruction (Regales, 2017). The slow transition of Dutch real estate developers to become more sustainable can be considered remarkable because research indicates that sustainability can lead to an increase in competitiveness. It has been proven that, among other positive outputs, enhancing sustainability can improve product quality, reduce energy usage, improve the rentability / ability to sell, improve managerial processes, reduce the use of raw materials, and contribute to the brand reputation or image of a company (van Driel & van Zuijlen, 2016; Hermundsdottir & Aspelund, 2020).

In other words, it seems as if there is a mismatch between what is being done in practice and what is being proven in literature. According to literature a competitive advantage can be gained from sustainability, yet implementing a sustainable corporate strategy often seems to be lacking for many Dutch RE developers. Therefore the problem statement of this research is stated as follows:

Dutch real estate developers often do not implement a sustainable corporate strategy, and when doing so they hardly go beyond-compliance. Furthermore, there is a lack of knowledge on what actions can be taken by Dutch real estate developers to become more sustainable and how those actions affect their competitiveness. Factors like these prevent a fast transition towards a more sustainable built environment.

There is a knowledge gap on what the impact is of obtaining a more sustainable corporate strategy on the competitiveness of Dutch real estate developers. This thesis aims to start filling this gap by providing insight on the impact of sustainable measures, that can be taken by Dutch real estate developers, on the competitiveness of those firms. By providing this insight, Dutch real estate developers might be more inclined to obtain a sustainable corporate strategy, thereby allowing a faster transition towards a sustainable built environment and reducing the significant impact on our environment. To start translating this impact to practice, the building blocks for designing a corporate decision tool to help Dutch real estate developers prioritize between sustainable alternatives is provided as well.

Research questions & Methodology

The main research question that is answered in this research is: "what is the impact of sustainable development activities that go beyond-compliance on the competitiveness of Dutch real estate developers?" In order to answer this question a series of sub-questions are adopted. These sub-questions are stated as follows:

1. What are the barriers that are withholding Dutch real estate developers from implementing a more sustainable corporate strategy?
2. What is the current 'compliance' position of Dutch real estate developers in relation to sustainability?

3. What are the key competitiveness indicators (KCI's) that determine the competitiveness of Dutch real estate developers?
4. Which sustainable development activities (SDA's) can be implemented by Dutch real estate developers?
5. To what extent do the SDA's taken by Dutch real estate developers impact their KCI's in the real estate market?
6. How should a corporate decision tool be designed to allow real estate developers to effectively choose between SDA's to improve their competitiveness?

The first three sub-questions are answered by means of a literature review and a survey. A literature review is done to gain insight on what barriers are currently present in the Dutch real estate development market, how the current sustainability position of a real estate developer can be determined, and what key competitiveness indicators can be identified for real estate developers. After the literature review the survey is used to generate several outputs. First the survey is used to rate to which extent the found barriers from literature are keeping Dutch real estate developers from implementing a sustainable corporate strategy. Second the survey is used to determine the average position of a Dutch real estate developer using the found method to determine the current sustainability compliance position. Third, the survey is used to determine to which extend the individual KCI's determine the competitiveness of Dutch real estate developers. This is done because a weighted summation of the scores on the KCI's was proven to be an effective method for measuring the competitiveness of a firm (Zhang, Shen, Wu, & Fan, 2009).

The fourth and fifth sub-questions are answered by means of a literature review and semi-structured interviews. The literature review provides insight on what sustainable development activities (SDA's) can be implemented by Dutch real estate developers. The semi-structured interviews are then used to extent this list of SDA's due to the reason that many sustainable development activities are found in practice. The structured section of semi-structured interviews is done to fill out a multi criteria decision analysis (MCDA) between the KCI's (SQ 3) and the SDA's (SQ 4), thereby answering the fifth sub-question of this research.

The last sub-question, is answered through literature and a focus group. The goal of this last sub-question is to start gaining an understanding of how a corporate decision tool should be designed to visualize the findings of the earlier phases of this research to allow decision makers to prioritize between sustainable alternatives. The focus is group is used to find the advantages and disadvantages between three different visualization of the MCDA and determine how the results can be used in practice, which leads to a refined design of the tool, the final output of this research.

In order to structure the report four different phases have been adopted. These phases are (1) first impressions and literature, (2) understanding the problem, (3) variables and impact analysis, and (4) designing tool. The sub-questions that are answered per phase are displayed in the table below.

Phase	Phase name	Sub-questions answered
1	First impressions and literature	
2	Understanding the problem	• Sub-question 1: *What are the barriers that are withholding Dutch real estate developers from implementing a more sustainable corporate strategy?* • Sub-question 2: *What is the current 'compliance' position of Dutch real estate developers in relation to sustainability?*
3	Variables and impact analysis	• Sub-question 3: *What are the key competitiveness indicators (KCI's) that determine the competitiveness of Dutch RE developers?* • Sub-question 4: *Which sustainable development activities (SDA's can be implemented by Dutch RE developers?* • Sub-question 5: *To what extent do the SDA's taken by Dutch RE developers impact their competitiveness in the real estate market?*
4	Designing tool	• Sub-question 6: *How should a corporate decision tool be designed to allow RE developers to effectively choose between SDA's to improve their competitiveness?*

Phase one: first impressions and literature

In this first phase of research, literature was utilized to gain a better understanding of the relevant topics of this research. The topics that were researched are: the assumption of a positive relationship between sustainability and competitiveness, barriers for obtaining a sustainable corporate strategy, competitiveness of real estate developers, sustainable development activities, and effective decision making.

Assumption of a positive relationship between sustainability and competitiveness

The main research question relies on the assumption that there is a positive relationship between sustainable development and an enhancement of competitiveness, therefore it must be clarified why it is reasonable to assume this. In general it is thought that there are two views towards sustainability, a traditionalist view and a revisionist view (Cai & Li, 2018; Hussain, Rigoni, & Cavezzali, 2018; Triebswetter & Wacklerbauer, 2008). The traditionalist view is where sustainability is seen as a cost-driver, whereas in the revisionist view it is understood that sustainability innovations do have the capability to generate a win-win situation and increase the competitiveness of a firm (Cai & Li, 2018; Palmer, Oates, & Portney, 1995; Walley & Whitehead, 1994; Porter & van der Linde, 1995).

The revisionist view has been proven to be truthful by different researchers. Sustainability can be used to increase product quality (Dey, Malesios, De, Chowdhury, & Abdelaziz, 2019), improve managerial processes by using assessment methods to identify and realize cost savings (Hojnik, Ruzzier, & Manolova, 2018), answer to an increasing number of customers who desire sustainable solutions (García-Sanchez, Gallego-Álvarez, & Zafra-Gómez, 2019; Lin, Tan, & Geng, 2013), and more. JLL (2007), identify a multitude of market drivers specific to the real estate market as well. These include increasing shareholder value and building value, tenant attraction and retention, reduced operating costs, brand protection, corporate social responsibility and increasing shareholder and building value. These market drivers and positive outputs of sustainability indicate that it is reasonable to assume that there is a positive relationship between implementing sustainability into a corporate strategy and the competitiveness of Dutch real estate developers.

Barriers for obtaining a corporate strategy

Based on research of Regales (2017), Williams & Dair (2007), and Zhang et al. (2011), thirty barriers were identified that contribute to preventing real estate developers from obtaining a more sustainable strategy. In order to organize these barriers, they are allocated to seven independent categories: financial-, legislative-, knowledge-, internal organizational-, external organizational-, and technical barriers. The identified barriers are used as a foundation for the survey held in phase two of this research.

Competitiveness of real estate developers

To be able to measure the impact of sustainability measures on the competitiveness of real estate developers it needs to be understood how the competitiveness of a real estate developer can be determined. Zhang et al. (2009), identify multiple methods of assessing the competitiveness of real estate enterprises, one of which is a combination of key competitiveness indicators (KCI's) and a weighted summation (WS). This method is done by identifying the weighted index of the key competitiveness indicators (KCI's) and measuring the score on each of those KCI's. By calculating the summation of those weighted scores the competitiveness of real estate enterprises can be measured.

Therefore, the KCI's of real estate developers need to be determined first. Li (2011), identified 34 components that together form seven different KCI's. These KCI's are adopted for this research and are stated as follows: management competency, organizing competency, technological capabilities, financial competency, market share, social responsibility, and regional competitiveness. In order to determine the weighted index of each of these KCI's the survey in phase two is used.

Sustainable development activities

Based on earlier held explorative interviews and literature it is clear that Dutch real estate developers have a broad selection of sustainable actions that can be implemented to obtain a more sustainable corporate strategy. However, it also became clear that more knowledge is required from practice. The complete overview of the SDA's that were adopted in this research can be found in phase three.

The individual sustainable actions were allocated to SDA's that function as umbrella terms. This was a necessary step in the research because testing the impact of all individual actions does not fit the timeframe. The five umbrella terms, or SDA's, that were found in literature are green product development, green supply chain management, green human resource management, green marketing and profiling strategy, and green facility management.

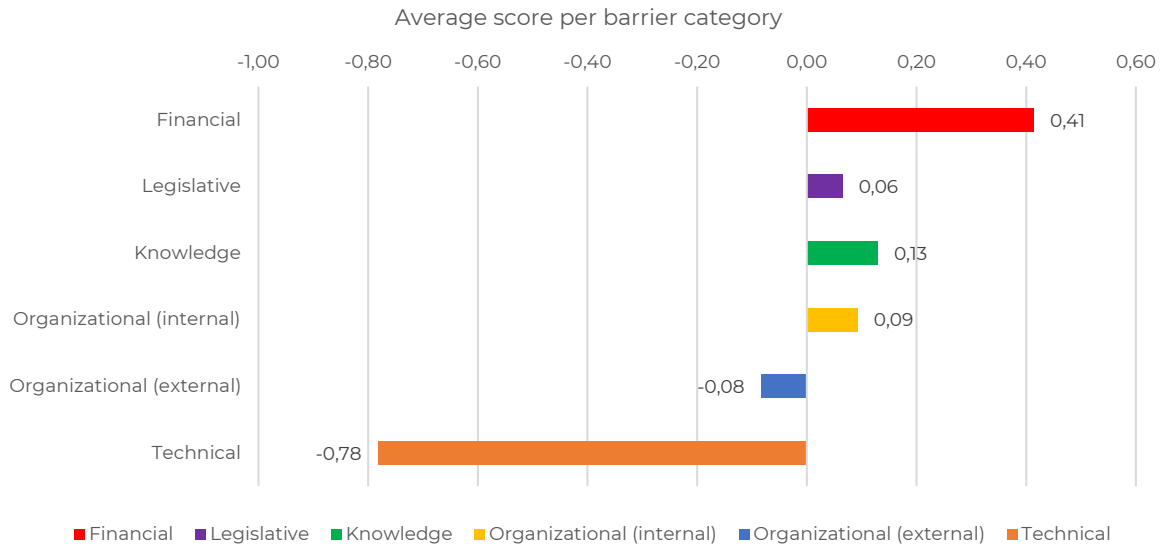
Effective decision making

In order to understand how the impact of one alternative (SDA's) can be measured against criteria (KCI's), literature was used as well. In the early phases of the literature study it became clear that a multi criteria decision analysis (MCDA) allows to effectively analyze the impact as desired, whilst being able to implement the weighted KCI method established earlier by Zhang et al. (2009). MCDA's can be executed in a multitude of ways. After the analysis of three separate MCDA methods it was found that a weighted assessment and sensitivity analysis as a visualization, as proposed by Dulmin & Mininno (2003), suited the objective and scope of the research most adequately and was therefore adopted in this research.

Phase two: understanding the problem

Prior to being able to determine what Dutch real estate developers can implement to become more sustainable, it needs to be understood what is currently withholding them from doing so, and where the average Dutch real estate developers stands in regard to sustainability. This allows to determine what sustainable actions or SDA's the research should focus on.

The first aspect of understanding the problem, is determining to which extent the thirty individual barriers were keeping Dutch real estate developers from becoming more sustainable. The thirty individual barriers are categorized using seven different categories. The respondents of the survey were asked to rate to which extent a barrier is keeping them from becoming more sustainable on a scale of -2 (strongly disagree) to 2 (strongly agree). This scale is a form of a Likert-scale, a renowned method for rating scales in surveys (Likert, 1932; Boone & Boone, 2012). The average score per barrier category is displayed in the figure below. A more in-depth analysis of the individual barriers can be found in the report.

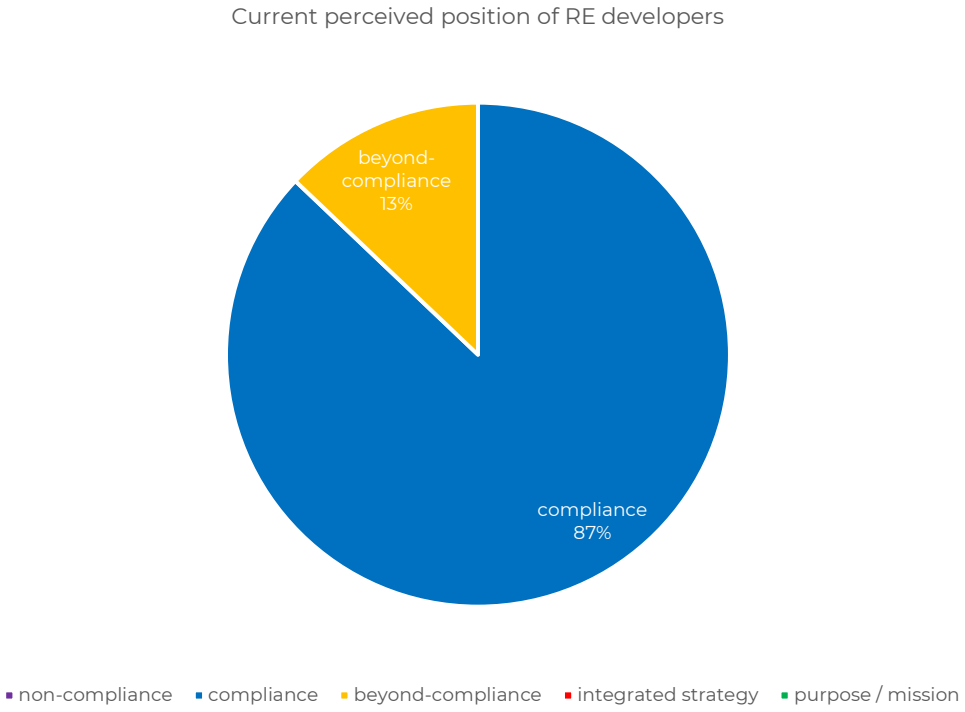


When analyzing the results of the category scores, two categories stand out. First, Dutch real estate developers indicated that they mostly experience financial barriers when attempting to obtain a more sustainable corporate strategy. On the contrary, it was found that technical barriers did not seem to form a obstruction. The average score per category is a good indicator of what barriers are present for Dutch real estate developers. However, the analysis of each of the individual barriers showed that there are other barriers that are withholding Dutch real estate developers from becoming more sustainable besides financial barriers. These barriers are sectoral responsibility (internal organization), a lack of courage (internal organization), the consideration of sustainable

solutions within the project team (external organization), and a difference in interest between stakeholders (external organization).

The second aspect which is of importance in phase two is determining the sustainability compliance position of Dutch real estate developers. To determine the sustainability position the five stages and emerging drivers of Senge et al. (2010) are used. These five stages are divided into two categories. The first category is the 'reactive' phases of non-compliance and compliance. In these stages, firms operate in a reactive manner towards law and regulations set by the government. The second category are the 'proactive' phases and compose of beyond-compliance, integrated strategy, and purpose/mission. Parties who find themselves in these phases realize the cost effectiveness of sustainability and realize that there is a much broader set of business opportunities available when a more sustainable corporate strategy is implemented (Senge, Smith, Kruschwitz, Laur, & Schley, 2010). In other words these phases are aligned with the revisionist view towards sustainability.

The survey respondents were asked to indicate the position of the average real estate developer in the Netherlands. The reason for asking the average position of the Dutch real estate market is to prevent bias and gain a broader understanding of the market with a smaller number of respondents, taking into account that there was a significant time constraint on the research. The results of the survey are displayed in the figure below.



All answers provided during the survey were either 'beyond-compliance' or 'compliance'. Of these two categories 'compliance' covered 87% of the responses. From this it becomes clear that Dutch real estate developers largely operate in the reactive phases of sustainability and mostly do not go beyond-compliance. For this reason no sustainable actions or SDA's were excluded from this research.

Phase three: variables and impact analysis

During the literature review it was determined that a multi criteria decision analysis (MCDA) allows to effectively prioritize between different alternatives (SDA's) based on a number of criteria (KCI's). This phase focuses on determining the alternatives and criteria for the MCDA and performing the impact analysis between them. The impact analysis is done to gain a better understanding of the relation between the individual SDA's (alternatives) and the KCI's (criteria).

The weighted criteria against which the different sustainable development activities (SDA's) are tested, are the key competitiveness indicators (KCI's). These KCI's were determined during the literature study of this research

and identified as management competency, organizing competency, technological capabilities, financial competency, market share, social responsibility, regional competitiveness (Li, 2011). In order determine the weight of each of these criteria the survey respondents were asked to indicate on a scale of 1 (not all important) to 5 (extremely important) how important each of the KCI's is for Dutch real estate developers. The average of the responses was taken into account as the weighted index of the KCI's and is displayed in the table below.

KCI	Management competency	Organizing Competency	Technological Capabilities	Financial competency	Market share	Social responsibility	Regional competitiveness
Average	3.94	3.52	2.90	4.35	3.61	3.35	3.29

After determining the criteria, the next variable that needed to be determined were the alternatives, or SDA's. During the literature review twenty actions were identified that were allocated to five different SDA's. During the semi-structured interviews 19 more individuals actions were identified, yet no additional SDA's. By determining the actions and SDA's, Dutch real estate developers have the opportunity to gain a better understanding of what sustainability truly entails and what can be done to become more sustainable.

The impact analysis of the SDA's on the KCI's was done in each semi-structured interview. The average results of the impact analysis are displayed in the table below. These average results indicate the relations between the individual alternatives and criteria. To gain a true understanding, further research is required.

What is the impact of the SDA's on the KCI's?		KCI's							
		Management competency	Organisation competency	Technological capabilities	Financial competency	Market share	Social responsibility	Regional Competitiveness	
		3,94 (weighted index)	3,52 (weighted index)	2,90 (weighted index)	4,35 (weighted index)	3,61 (weighted index)	3,35 (weighted index)	3,29 (weighted index)	
SDA's	Green product development	2,66	2,46	2,10	3,48	2,98	2,52	2,80	**19,00**
	Green Supply Chain Management	2,56	2,20	2,10	3,05	2,27	2,26	2,07	**16,51**
	Green Human Resource Management	2,75	2,73	1,67	2,40	2,17	2,43	1,89	**16,04**
	Green profiling and marketing strategy	2,85	2,29	1,45	3,27	2,71	2,18	2,47	**17,21**
	Green facility management (intern / extern)	2,56	2,29	1,74	2,50	1,90	2,26	1,56	**14,81**
		13,38	**11,95**	**9,07**	**14,70**	**12,03**	**11,66**	**10,79**	

From the impact analysis several aspects become clear. First, to what extent each of the SDA's impact the competitiveness of real estate developers. The SDA's with the highest cumulative scores (indicated on the right hand side of the table) have the largest positive impact on the competitiveness of Dutch real estate developers and therefore are most likely to contribute to enhancing the competitiveness of a firm. Second, the cumulative scores at the bottom of the table indicate which weighted KCI can be affected most by implementing SDA's. It was interesting to find that financial barriers form the largest obstruction to become more sustainable, but when analyzing the impact of SDA's on the competitiveness of Dutch real estate developers it became clear that most competitive gain can be achieved in financial competency.

Phase four: designing tool

The fourth phase of this research focuses on gaining an understanding of how a corporate decision tool should be designed to visualize the results of phase three. This is done to create a preliminary design of a corporate decision tool which will act as a stepping stone towards a definitive design to eventually allow Dutch real estate developers to effectively prioritize between SDA's. In literature three different methods of visualizing data from MCDA / tables were found, namely, a Geometrical Analysis for Interactive Assistance (GAIA), heat-mapping, and parallel coordinate plots. An example of each of these visualization techniques along with how the data of the MCDA can be displayed using these techniques can be found in section 10.

To comprehend what visualization technique had te least amount of cognitive burden and is most suitable in practice the visualizations were presented to a focus group. During the focus group it was found that the

visualization using the heat mapping method was most applicable to practice. The participants of the focus group indicated that the heat-mapping method created the least amount of cognitive burden whilst displaying the results of the MCDA accurately. Furthermore it was the only model that efficiently displayed the order in which the SDA's and KCI's scored in the interviews. The GAIA chart and parallel coordinate plot were found to be difficult to read and did not allow the decision maker to easily identify what to focus on in the results. Displaying the impact between these variables using color intensity does allow decision makers to quickly focus on what results are of importance in a natural manner. Therefore, the following visualization was chosen to act as a stepping stone towards a definitive design.

			Key competitiveness indicators (KCI's)						
			Financial competency	Management compentency	Organisation competency	Market share	Social responsibility	Regional Competitiveness	Technological capabilities
	Total score all SDA's on KCI (scale 0-25)		14,70	13,38	11,95	12,03	11,66	10,79	9,07
	Total score of SDA on all KCI's (scale 0-35)								
sustainable development activities (SDA's)	Green product development	19,00	3,48	2,66	2,46	2,98	2,52	2,80	2,10
	Green profiling and marketing strategy	17,21	3,27	2,85	2,29	2,71	2,18	2,47	1,45
	Green Supply Chain Management	16,51	3,05	2,56	2,20	2,27	2,26	2,07	2,10
	Green Human Resource Management	16,04	2,40	2,75	2,73	2,17	2,43	1,89	1,67
	Green facility management (intern / extern)	14,81	2,50	2,56	2,29	1,90	2,26	1,56	1,74

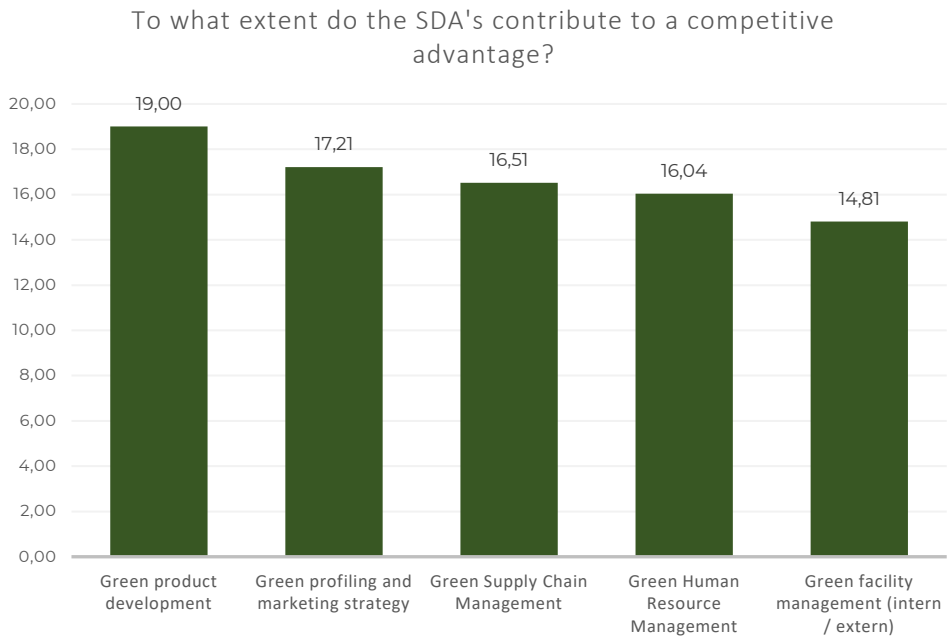
The respondents of the focus group indicated that the three different scales in the model caused confusion. In the conclusion a refined design of the heat mapping method of visualizing an MCDA with equal scales is provided.

Conclusion

This research aims to provide an answer to the main research question: "What is the impact of sustainable development activities that go beyond-compliance on the competitiveness of private Dutch real estate developers?" To effectively go about answering this research question, the report first provides an understanding what is keeping Dutch real estate developers from becoming more sustainable and where Dutch real estate developers currently stand in terms of sustainability. Thereafter, the alternatives and criteria necessary to perform an impact analysis are determined and the impact analysis is performed. Lastly to contribute to the practical relevance and applicability of this research, the findings of the impact analysis are visualized to gain a first understanding of how the results can be translated to a corporate decision tool.

Based on the survey results it can be concluded that Dutch real estate developers do not significantly experience all the barriers indicated in literature. According to the respondents, Dutch real estate developers mostly experience financial barriers and some specific examples from the other categories. Yet, the average Dutch real estate developers finds themselves in the 'compliance' phase in regards to sustainability. This phase is characterized by operating in a reactive manner to the laws and regulations set by government, and not acting proactively to become more sustainable (Senge, Smith, Kruschwitz, Laur, & Schley, 2010).

To determine to what extent sustainability measures can impact the competitiveness of Dutch real estate developers, the SDA's and KCI's needed to be determined. It was found that the sustainable actions available to Dutch real estate developers can be categorized using the following umbrella terms: green product development, green supply chain management, green human resource management, green profiling and marketing strategy, green facility management. The research of Li (2011) showed that the KCI's, the criteria against which these SDA's are tested, are management competency, organization competency, technological capabilities, financial competency, market share, social responsibility and regional competitiveness. When taking the weighted index of these criteria, determined through the survey, and the impact of the SDA's on the KCI's, determined through the semi-structured interviews, an order of the highest impact on the competitiveness can be determined. This order is displayed in the figure below.



To translate the results of the impact analysis three visualization were presented in a focus group. It was found that using heat-mapping to translate the findings of the MCDA was most successful in letting decision makers prioritize between different SDA's regarding the impact on the competitiveness of Dutch real estate developers. The preliminary design of the corporate decision tool taking the considerations of practitioners into account is displayed below.

			Key competitiveness indicators (KCI's)						
			Financial competency	**Management compentency**	**Organisation competency**	**Market share**	**Social responsibility**	**Regional Competitiveness**	**Technological capabilities**
	average score all SDA's on KCI →		2,94	2,68	2,39	2,41	2,33	2,16	1,81
	average score of SDA on all KCI's ↓								
sustainable development activities (SDA's)	**Green product development**	2,71	3,48	2,66	2,46	2,98	2,52	2,80	2,10
	Green profiling and marketing strategy	2,46	3,27	2,85	2,29	2,71	2,18	2,47	1,45
	Green Supply Chain Management	2,36	3,05	2,56	2,20	2,27	2,26	2,07	2,10
	Green Human Resource Management	2,29	2,40	2,75	2,73	2,17	2,43	1,89	1,67
	Green facility management	2,12	2,50	2,56	2,29	1,90	2,26	1,56	1,74

Reading guide

The first chapters of the report are dedicated to a introduction of the topics and the methodology of how the research is performed. In order to further structure the report four different phases were adopted throughout the research. The first phase focuses on the first impressions and findings from literature. The second phase focuses on understanding what is keeping Dutch RE developers from obtaining a more sustainable corporate strategy and the current sustainability compliance position of Dutch real estate developers. The third phase is dedicated towards determining the variables for a impact analysis of sustainable measures (sustainable development activities / SDA's) and the competitiveness (key competitiveness indicators / KCI's) of Dutch real estate developers. This phase continuous with an impact analysis between those independent variables. The fourth and last phase is dedicated to visualizing the results of the impact analysis to a corporate decision tool. After the four phases of research the findings and conclusions are presented. The table below gives a comprehensive overview of what to expect throughout the report.

Phase	Chapters	Topics
Introduction	1-3	• Introduction • Research questions and methodology • Explanation of most important terms from main research question
Phase one	4	• Literature review on the assumption of a positive relationship between sustainability and competitiveness • Literature review on the barriers withholding real estate developers from implementing a sustainable corporate strategy • Literature review on the competitiveness of real estate developers • Literature review on sustainable development activities of Dutch real estate developers • Literature review on effective decision making
Phase two	5-6	• Survey results on the barriers withholding Dutch real estate developers from implementing a more sustainable corporate strategy • Survey results on the current sustainability compliance position of Dutch real estate developers
Phase three	7-9	• Determining the weight of the KCI's that together measure the competitiveness of a firm • Determining the SDA's that describe the sustainable measures that can be taken by Dutch real estate developers • Impact analysis of the KCI's on the SDA's by means of a multi criteria decision analysis
Phase four	10	• Translating findings from the multi criteria decision analysis to a corporate decision tool
Conclusions and more	11-15	• Discussion • Conclusion • Recommendation • Reflection

Abstract

Dutch real estate developers are being pressured to obtain a more sustainable corporate strategy to guarantee competitiveness and continuity of their firm. Even though this contextual pressure is being recognized by Dutch real estate developers, it is often not translated to practice. This is remarkable because studies over time have proven that sustainability has the potential lead to an enhanced competitiveness. This study aims to provide a deeper understanding of what is withholding Dutch real estate developers to implement a sustainable corporate strategy, and what the impact is of sustainable development activities is on the competitiveness of such a party. To test this, a literature study was performed to provide insight on the barriers that are present for real estate developers to become more sustainable, how the competitiveness of a Dutch real estate developer can be measured, and which alternatives Dutch real estate developers can implement to become more sustainable. A survey was distributed amongst Dutch real estate developers to determine to what extent certain barriers are withholding them from becoming more sustainable and determine the current position in regards to sustainability. The results show that Dutch real estate developers, amongst some individual barriers from other categories, are mostly being kept from becoming more sustainable due to financial barriers. This is causing Dutch real estate developers to find themselves in a reactive position towards the sustainability laws and regulations set by the government and not proactively operating to become more sustainable. By giving insight towards how sustainability can improve the competitiveness, this problem can be alleviated. Through semi-structured interviews the impact of sustainable development activities on the competitiveness of Dutch real estate developers was measured. The results in general show that sustainability does contribute to the competitiveness of Dutch real estate developers. The order of impact of the sustainable development activities that were found is (1) green product development, (2) green profiling and marketing strategy, (3) green supply chain management, (4) green human resource management, and (5) green facility management. The last phase of this research provides a preliminary design of a corporate decision tool to act as a stepping stone for further research to eventually allow Dutch real estate developers to effectively prioritize between sustainable alternatives.

Key terms:
Competitiveness, Dutch real estate developers, sustainable development activities, key competitiveness indicators, corporate strategy, corporate social responsibility, corporate sustainability, corporate decision tool

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Glossary

Competitive advantage	A condition that allow a company to grow and thrive, positively influences the stakeholders at hand, and positively differentiates one entity from another.
Corporate strategy	The ideas and plans a company has for its future business activities, or the process of deciding these ideas and plans within a company (Cambridge Dictionary, 2021)
Corporate sustainability	Meeting the needs of firm's direct and indirect stakeholders, without comprising its ability to meet the needs of future stakeholders as well (Dyllick & Hockerts, 2002)
Corporate social responsibility	Taking responsibility for the impact of your business operation on man, the environment and society (Business.gov.nl, 2021)
Sustainable development activity	A sustainable development principle (i.e. green product development) that describes a set of individual sustainable actions that can be implemented by a Dutch real estate developer
Sustainable actions	A individual action (i.e. develop flexible buildings) which is allocated to a certain sustainable development activity
Green product development	A sustainable development activity used to describe all sustainable actions that are related to developing products/buildings to obtain a more sustainable corporate strategy
Green supply chain management	A sustainable development activity used to describe all sustainable actions that are related to developing with partners to obtain a more sustainable corporate strategy
Green human resource management	A sustainable development activity used to describe all sustainable actions that are related to employees to obtain a more sustainable corporate strategy
Green profiling and marketing strategy	A sustainable development activity used to describe all sustainable actions that are related to profiling and marketing to obtain a more sustainable corporate strategy (note: not greenwashing)
Green facility management	A sustainable development activity used to describe all sustainable actions that related to internal and external facility management to obtain a more sustainable corporate strategy
Key competitiveness indicator	Indicators that are of importance to determining the competitiveness of a firm
Management Competency	(key competitiveness indicator) "… the activities of real estate value chain realization, which mainly include strategic management, time management, cost management, quality management, risk management, environmental management, safety management, contract management, and collaboration management." (Li, 2011, p. 55)
Organizing competency	(key competitiveness indicator) "… the capability of motivating people to act within organizations, which include disciplines like organizational behavior, human resources, and management" (Li, 2011, p. 56)

Technological capabilities	(key competitiveness indicator) "For a real estate development enterprise, its technological capabilities can be reflected by aspects such as IT technology, technological advancement, R&D capability, construction technology and consumers' satisfaction to technology." (Li, 2011, p. 56)
Financial competency	(key competitiveness indicator) "The financial competency of developers can be measured from the aspects financing capabilities and capital growth" (Li, 2011, p. 56)
Market share	(key competitiveness indicator) "… a factor used to reflect the percentage or proportion of total available market serviced by a corporate" (Li, 2011, p. 56)
Social responsibility (CSR)	(key competitiveness indicator) "The goal of CSR is to integrate responsibility into the corporate's actions and encourage a positive impact on the environment, communities, consumer, employees and all stakeholders" (Li, 2011, p. 57)
Regional Competitiveness	(key competitiveness indicator) "… a reflection of the competitiveness of a corporate in a region." (Li, 2011, p. 58)

List of abbreviations

CSR	Corporate social responsibility
CS	Corporate sustainability
GSCM	Green supply chain management
GHRM	Green human resource management
GAIA	Geometrical analysis for interactive assistance
KCI	Key competitiveness indicator
RE	Real estate
SDA	Sustainable development activity
WS	Weighted summation
MCDA	Multi criteria decision analysis

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1. Introduction

The necessity for sustainable solutions is a global phenomenon which can no longer be ignored, especially in the real estate industry. The built environment, generating nearly 40% of global energy consumption and approximately one-third of global CO_2 emissions (JLL, 2020), plays a large role in future of our environment. Real estate must become more sustainable (van Driel & van Zuijlen, 2016). Annemarie van Doorn, director of DGBC (Dutch Green Building Council) agrees with this statement. She states that the transition to a more sustainable built environment is something that cannot wait any longer (Vastgoed Journaal, 2020). Furthermore, according to Senge et al. (2010), corporations are increasingly focusing on corporate sustainability and corporate social responsibility. These structural trends are causing corporations, like private real estate developers, to act in a sustainable manner, because they have accepted that they must do so to thrive or even survive as an organization. This indicates that there is a large amount of pressure on firms to obtain a sustainable corporate strategy, also for real estate developers. This pressure originates from different sources.

One of these sources is a change in legislation. The government is using policies such as BENG (almost energy neutral buildings) and the Paris Agreement to push the built environment towards sustainability. These policies are forcing real estate enterprises to consider more sustainable products and processes. Furthermore, there is currently a rise in demand in all sectors of real estate for sustainable solutions (JLL, 2020; JLL, 2019; CBRE Research, 2020). Real estate developers need to answer to the demand to continue to operate, also pressurizing them to become more sustainable. Thirdly, another aspect is that the momentum for sustainable change has been building for some time (Deloitte, 2020). The general mindset has changed, causing a movement resulting in a different way of thinking. As indicated by Deloitte (2020), climate change-informed investments used to primarily exist for “responsible” investors, however, now it is seen as a risk not to engage in sustainable investments at all. This shows that the pressure for sustainable solutions on real estate developers is also exerted by investors.

The increase of corporate social responsibility (CSR) is also affecting the real estate market. Arising challenges such as urbanization, gentrification, climate change and more, has caused CSR to gain global attention in the real estate industry (Becker & Murphy, 2000; Roberts, Rapson, & Shiers, 2007). In today’s real estate industry, the emphasis of CSR lies on constructing a ‘sustainable built environment’ which includes both urban and rural areas (Wilkinson, Dixon, Sayce, & Miller, 2018). It is important that in the development of this ‘sustainable built environment’ that social, environmental, and economic development are integrated. Without the integration of these 3 aspects a sustainable built environment fails to exist (Senge, Smith, Kruschwitz, Laur, & Schley, 2010).

In their ways of working practices, real estate developers almost don’t have a choice anymore but to become more sustainable. The significant amount of contextual pressure can no longer be ignored, and developers must focus on sustainability to continue to compete in the real estate market. Moreover, during the explorative interviews held prior to this research professionals indicated that sustainability measures must be adopted by real estate developers to prevent being outcompeted by other firms.

1.1 Problem statement

Even though Dutch RE developers see the necessity to innovate and develop (Haak & Heurkens, 2015), and realize the importance of sustainability (NEPROM, 2018), a translation of the pressure to actual actions does not always occur (J. Stoop, personal communication, 17 September 2020). Furthermore, firms hardly go beyond-compliance when it comes to sustainability (Heurkens, 2019).

In the Netherlands it is thought that the pace at which the built environment is innovating and adapting to a more sustainable sector is too slow (Haak & Heurkens, 2015; Heurkens, 2017; Van der Heijden, 2017). Furthermore, Dutch RE developers are insufficiently aware of the diverse aspects that sustainability entails (Buskens & Heurkens, 2016). Regales (2017), indicates several barriers that are causing this problem. Financial barriers, like split-incentives, high costs and time delay, seem to have the biggest impact on keeping the RE developers from becoming more sustainable. Furthermore, legislative, knowledge and organizational barriers are also contributing to the problem. That the financial barriers are prominent in keeping the developers from obtaining a more sustainable corporate strategy is backed by other researchers as well. According to Heurkens (2019), and Senge et al. (2010), sustainability is often seen as a costly aspect as opposed to a profitable long-term investment. This traditionalist view is keeping RE developers from implementing a more sustainable corporate strategy to allow a faster transition towards a more sustainable built environment.

Moreover, Dutch RE developers hardly go beyond compliance, or in other words, exceed the regulations set for sustainability that are enforced upon the developers through legislation (Heurkens, 2019). This is often due to the diverse regulations set by governing parties as well. For example, a demand from the government to incorporate diversity regarding low, middle, and high segment housing is already pressurizing the business case behind a project to such an extent that sustainability becomes hard to incorporate (personal communication, K. Heemskerk, 02-12-2020). Not going beyond the regulations set by governing parties is also contributing to a slower transition towards a built environment.

One of the most predominant barriers is the split-incentive for RE developers due to their (often) short involvement in a project. There are several types of split-incentives that affect RE developers. The first type is efficiency-related split-incentives. In these cases, the landlord lacks incentives, and therefore indirectly the RE developer as well, for investing in sustainable solutions because they do not directly receive the benefit of those solutions. A second split-incentive is the usage-related split incentive. These occur when a party remains owner of the building and pays for utilities in which case the user is not incentivized to reduce consumption of energy. Thirdly, a temporal split-incentive also affects the built environment. These split-incentives occur when a party is shortly involved in the usage of a building and therefore does not notice the pay-off from high upfront costs on sustainability measures. This third split-incentive is especially present for the RE developers (European Comission, 2017).

On the contrary it has also been proven that implementing sustainable development strategies can lead to a competitive advantage due to numerous positive outputs. For example, improving sustainability can reduce the impact on the environment, reduce operational costs, improve product quality, reduce energy usage, improve rentability / ability to sell, improve managerial processes, reduce the use of raw materials, and contribute to the brand reputation or image of a company (van Driel & van Zuijlen, 2016; Hermundsdottir & Aspelund, 2020). Moreover, a small amount of RE developers in the Netherlands have proven to be able to gain a competitive advantage using sustainability as one of their primary drivers.

When analyzing the outputs of obtaining a more sustainable corporate strategy several stand out that are significant to Dutch real estate developers. These include improvement of product quality, improvement of rentability / ability to sell, contribute to brand reputation or image of a company, increasing shareholder and building value, answer to the demand for socially / environmental responsible investments, and more. The barriers that are withholding Dutch RE developers from implementing a more sustainable corporate strategy often focus on individual projects and outputs like an improvement of image of a firm through sustainability are often not considered in the business case behind sustainable solutions.

To summarize, there seems to be a mismatch between what is being proven in literature and what is happening in practice. According to literature a competitive advantage can be gained from sustainability, yet implementing a sustainable corporate strategy is lacking for many Dutch RE developers. Therefore, the problem statement for this research is stated as follows:

Dutch real estate developers often do not implement a sustainable corporate strategy, and when doing so they hardly go beyond-compliance. Furthermore, there is a lack of knowledge on what actions can be taken by Dutch real estate developers to become more sustainable and how those actions affect their competitive advantage. Factors like these prevent a fast transition towards a more sustainable built environment.

1.2 Scientific relevance of this research

The concept of competitive advantage and sustainability have been widely researched and as mentioned before, it has been proven that sustainability can lead to a competitive advantage. However, there is little to no research covering what exactly a Dutch RE developer can do to implement a more sustainable corporate strategy and how those action affect their competitive advantage in de RE development market. This thesis aims to start filling this knowledge gap by supplying insight on how sustainable development activities can be used to achieve a competitive advantage.

1.3 Practical and societal relevance of this research

Besides scientific relevance, this research also has a significant societal and practical relevance. As mentioned before, the transition to a more sustainable built environment cannot wait any longer. The importance of sustainability is recognized by real estate developers, and other real estate enterprises, yet integrated

sustainable corporate strategies seem to be lacking in the market. Furthermore, as mentioned by Buskens and Heurkens (2016), Dutch RE developers are insufficiently aware of what sustainability truly entails, this in combination with a traditionalist view towards sustainability does not allow them to see their full potential on how they can improve their sustainability in their corporate strategy. Therefore, the practical relevance of this study consists of multiple parts.

First, the research provides insight on what sustainable development activities can be implemented by Dutch RE developers to obtain a more sustainable corporate strategy. By generating an overview of what sustainable development activities (SDA's) exist in the Dutch RE development market, developers are provided with a clear overview of what can be done to improve sustainability in their operations. This helps developers to choose effectively between different strategies. This is important because every firm is unique and has their own way of operating (Zhang, Shen, Wu, & Fan, 2009). Where one real estate enterprise might be excelling in a certain aspect of sustainability, another might not.

Second, by supplying insight on how SDA's can positively influence a competitive advantage, Dutch RE developers might be more motivated to implement such strategies. As mentioned before, a traditionalist view towards sustainability where it is seen as a costly investment, rather than a profitable long-term investment, currently dominates a large part of the market. By focusing the research on something that all Dutch RE developers desire, a competitive advantage, they might be more swayed to obtain a sustainable corporate strategy.

Finally, as mentioned before, real estate must become more sustainable. The transition to a more sustainable built environment cannot wait any longer (Vastgoed Journaal, 2020). That sustainability is currently still a concerning topic is indicated by Savills, renowned Dutch RE consultant, as well. Savills indicates that one of the four major challenges for the Dutch built environment of 2021 is sustainability and the implementation of environmental and social governance (ESG) (Savills, 2020). This indicates that there is still work to be done to move towards a more sustainable built environment. By motivating Dutch RE developers to obtain a more sustainable corporate strategy, this research contributes to resolving this challenge.

2 Research questions & Methodology

Based on the problem statement, the main research question that is answered in this research is stated as follows:

"What is the impact of sustainable development activities that go beyond-compliance on the competitiveness of private Dutch real estate developers?"

Three terms of the forementioned research question require further explanation prior to researching. This is done in chapter 3. The terms that are explained are sustainable strategies, beyond-compliance, and competitiveness.

2.1 Sub-Questions

To help answer the main research question a series of sub-questions is adopted. Below an overview of each of the sub-questions is provided together with a short description of the objective of the question. The methods, techniques, data collection, and data collection are discussed more in-depth in section 2.4.

Sub-question 1	*What are the barriers that are withholding Dutch RE developers from implementing a more sustainable corporate strategy?*
Data collection	Literature review and survey

The objective of this question is to gain an understanding of what barriers, and to which extent, are keeping Dutch RE developers from obtaining a more sustainable corporate strategy. Knowing the barriers that are withholding Dutch RE developers contributes to gaining a clear understanding of the problem. To structure the barriers, they are categorized into six categories, namely: financial, legislative, knowledge, organizational (internal), organizational (external), and technical barriers.

Sub-question 2	*What is the current 'compliance' position of Dutch RE developers in relation to sustainability?*
Data collection	Literature review and survey

This sub question determines the perceived position of the Dutch RE development market using the five stages and emerging drivers of Senge et al. (2010)[1]. By determining the position of the market, the steps that need to be taken to move to a desired position can be identified using the descriptions for each stage of the five stages and emerging drivers. Furthermore, it allows to determine whether certain sustainable development activities (SDA's) should be excluded from this research.

Sub-question 3	*What are the key competitiveness indicators (KCI's) that determine the competitiveness of Dutch RE developers?*
Data collection	Literature review and survey

The objective of this sub-question is to determine how the competitiveness of Dutch RE developers can be measured. In the early stages of literature review it was found that Zhang et al. (2009) provide a method for measuring the competitiveness of firms using key competitiveness indicators (KCI's) and a weighted summation (WS). This method is applied throughout the rest of this research. Determining the KCI's of Dutch RE developers allows to understand what aspects of competitiveness can be improved by means of obtaining a more sustainable corporate strategy.

Sub-question 4	*Which sustainable development activities (SDA's) can be implemented by Dutch RE developers?*
Data collection	Literature review and semi-structured interviews

This sub-question gives insight into what actions can be taken by Dutch RE developers to obtain a more sustainable corporate strategy. Due to the timeframe of this research each of the individual actions that Dutch

[1] See chapter 'Explanation of terms' section 'beyond-compliance'.

RE developers can implement to become more sustainable have been categorized using SDA's. The SDA's that are taken into consideration are green product development, green supply chain management, green human resource management, green profiling and marketing strategy, and green facility management.

Sub-question 5	*To what extent do the SDA's taken by Dutch RE developers impact their KCI's in the real estate market?*
Data collection	Literature review and semi-structured interviews

The objective of this sub-question is to analyze the impact of the sustainable development activities (the alternatives derived from SQ 4) on the key competitiveness indicators (the criteria derived from SQ 3) of Dutch RE developers. By analyzing the impact using a multi-criteria-decision-analysis (MCDA) (see section 4.5), priorities can be given to certain SDA's when deciding on what sustainability measures to implement when trying to obtain a more sustainable corporate strategy.

Sub-question 6	*How should a corporate decision tool be designed to allow RE developers to effectively prioritize between SDA's to improve their competitiveness?*
Data collection	Literature review & focus group

The objective of this last sub-question is to provide a first understanding of how a corporate decision should be designed to effectively allow Dutch RE developers to prioritize between SDA's when aiming to improve their competitiveness. This first understanding is visualized to act as a stepping stone for further research.

2.2 Dependencies between sub-questions

The research is structured to first gain a clear understanding of the problem, and thereafter provide more insight to how the found problem can be solved. Due to the structure of this research some of the sub-questions have dependencies on other sub-questions as indicated in figure 1. The barriers and the current position of the RE development market (sub-questions 1 & 2) determine what SDA's are considered for this research. Furthermore, the SDA's and the KCI's that are found in sub-questions 3 and 4 determine the different alternatives and criteria that are analyzed in the MCDA. Lastly the findings of the MCDA are used to design a corporate decision tool which allows Dutch RE developers to prioritize between different SDA's in sub-question 6.

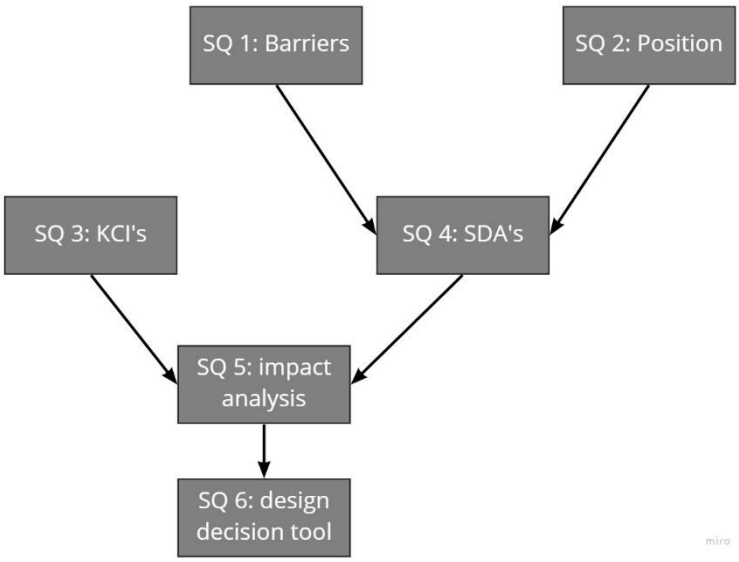

figure 1: influence between sub-questions (own illustration)

2.3 Methodological approach

As indicated in the description of each sub-question, this research uses primarily qualitative data with supportive quantitative data (surveys). Furthermore, there is a mix between empirical and operational research. The mix between empirical and operational research is indicated in figure 2. The green arrows represents at which step of the process the switch is made between empirical and operational research.

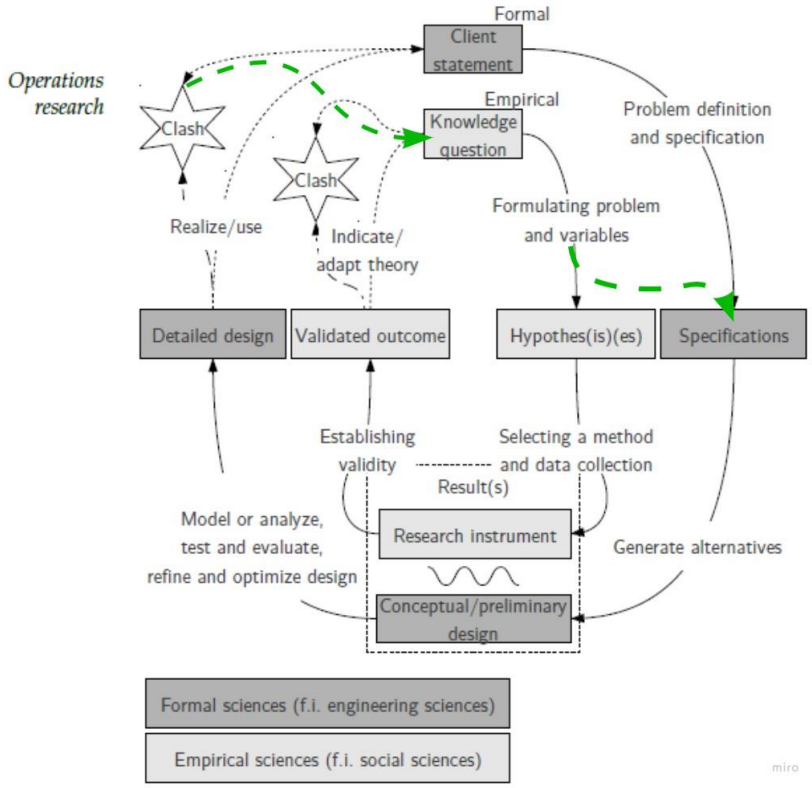

figure 2: Engineering and social sciences, adapted from P. Barendse et al. (2012)

The mix between empirical and operational research is due to first having to fully understand the problem (empirical) and thereafter designing a tool to help solve the problem (operational). Due to the time in which this research is conducted, this report limits the research to a preliminary design.

2.4 Methods and techniques, data collection and analysis

Section 2.1 shortly mentioned what methods and techniques are used to gather the data necessary to answer each sub-question. This section provides more insight into the methods and techniques, data collection, and data analysis for each of the sub-questions.

2.4.1 Sub-question one: What are the barriers that are withholding Dutch RE developers from implementing a more sustainable corporate strategy?

The first sub-question is answered using two different methods of obtaining data, namely, a literature review and surveys. The literature review is used to identify possible barriers that are keeping RE developers from implementing a sustainable corporate strategy and is later used as a foundation for the surveys. The result of the literature review is a list of categorized barriers that are applicable to RE developers in general. The categories of those barriers are financial, legislative, knowledge, organizational (internal), organizational (external), and technical.

The second method used to answer this sub-question, the survey, gives a better understanding of what is keeping the Dutch RE developers from implementing a more sustainable corporate strategy. The survey asks the respondents to rate the barriers found from literature on a scale from -2 to 2. The rating scale is displayed in the table below. The rating scale is a Likert scale, a renowned method for rating scales in surveys (Likert, 1932; Boone & Boone, 2012), and measures the presence of the barriers that are keeping Dutch RE developers from implementing a more sustainable strategy.

table 1: rating scale for survey sub-question 1 (McLeod, 2019)

score	-2	-1	0	1	2
response	Strongly disagree	disagree	Neutral / No opinion or experience	agree	Strongly agree

The complete survey is displayed in appendix A – survey.

The barriers are given in a randomized order to prevent bias in the answers. Furthermore, the respondents are given an opportunity to provide extra barriers with the same scoring system to allow extra information to be gathered for the Dutch RE market which has not been found in literature. This will be done by giving a blank space for the respondents at the end of the survey questions considering the barriers, here they can fill out what barrier is missing in their opinion and how it should be scored. For more information examples of the survey are provided in the appendices. Information concerning the population, sample and respondents is discussed in section 2.5.1.

The outcome of this sub-question is a list of scored barriers that are withholding Dutch RE developers from currently implementing a sustainable corporate strategy. The list can be ordered using the prior found categories to find out which has the highest influence. This is of significance because it is unlikely that a sustainable development activity will solely overcome one barrier, therefore generalizing using the categories will make it easier to understand the relation between these aspects. This list is used to firstly gain a better understanding of the problem, and secondly help focus the research on certain SDA's which contributes to making the research more practically relevant.

2.4.2 Sub-question two: What is the current 'compliance' position of Dutch RE developers in relation to sustainability?

This sub-question is also answered using the survey. In the survey the five stages and emerging drivers of Senge et al. (2010) are described using literature, to provide the respondent with a clear understanding of what each of the stages entails. To ensure that respondents do not try to promote their own firm, it is asked to provide an opinion on the average position of the market, not their firm itself. This prevents inaccurate measurements due to bias or respondents coming from a certain level of developers regarding sustainability, i.e., front runners. Furthermore, it also allows to gain a broader understanding of the market in general.

The answers to this survey question allow to determine the perceived market position regarding sustainability compliance. Each of the stages is given as a possible answer. After gathering all the answers, the current position is determined by the median of the results. The reason for this is that the possible answers are ordinal data because there is a logical order to the stages, however, the intervals between the options are not equal (Field, 2018).

The output will not only give an accurate idea of the perceived position of the market, but it also allows to understand what needs to be done to move to a desired position where RE developers are obtaining a more sustainable corporate strategy. Furthermore, certain sustainability measures can be excluded if they are already answered for by the current position of the market.

2.4.3 Sub-question three: What are the key competitiveness indicators (KCI's) that determine the competitiveness of Dutch RE developers?

Like sub-question one, this sub-question is also answered using two methods for data collection. First, a literature review is done to identify key competitiveness indicators (KCI's) that are currently known for RE developers in general. The result of the literature review is a list of KCI's which are used as a foundation for the second part of answering this sub-question, the survey.

The survey asks respondents to score each of the KCI's to find the weighted index to calculate a weighted summation, which is found to be an effective method for measuring the competitiveness of a firm (Zhang, Shen, Wu, & Fan, 2009). The respondents are provided a list of KCI's (see figure 7) with a description and are asked to indicate to what extent the KCI is significant for competitiveness in the Dutch real estate development market. The KCI's that they are asked to assess are management competency, organizing competency, technological capabilities, financial competency, market share, social responsibility, and regional

competitiveness (Li, 2011). To assess this, the respondents are asked to rate each of the KCI's using a five-point Likert scale that measures the importance of each of the categories. The rating scale is indicated in table 2.

table 2: rating scale KCI's (McLeod, 2019)

score	1	2	3	4	5
response	Not at all important	Slightly important	Moderately important	Very important	Extremely important

The output of this sub-question is a scored list of KCI's which simultaneously forms the first variable necessary for the corporate decision tool, the output of this research. The number and description of respondents for the interviews are discussed in section 2.5.1

2.4.4 Sub-question four: Which sustainable development activities (SDA's) can be implemented by Dutch RE developers?

Prior to the interviews a selection of SDA's is determined through literature and market research. The market research is done through explorative interviews and information gained from practice. A selection of measures that can be taken by RE developers, referred to as actions, are summarized into five umbrella terms, referred to as sustainable development activities (SDA's). These SDA's are green product development, green supply chain management, green human resource management, green profiling and marketing strategy, green facility management.

The output of this sub-question is a list of actions and SDA's which can be implemented by Dutch RE developers to improve their sustainable development activity. This list is used as the second variable for the corporate decision tool the output of this research.

2.4.5 Sub-question five: To what extent do the SDA's taken by Dutch RE developers impact their KCI's in the real estate market?

In order to understand how the SDA's affect the competitiveness of Dutch RE developers an impact analysis of the SDA's on the KCI's is executed. Literature is utilized to find a technique how to effectively do a forementioned impact analysis.

During the interviews, the respondents are asked to indicate a level of impact between the using the same 5-point Likert as in sub-question three. The extra option of no relationship between the variables (SDA and KCI) is also provided. Through doing so the relations between the individual

2.4.6 Sub-question six: How should a corporate decision tool be designed to allow RE developers to effectively prioritize between SDA's to improve their competitiveness?

This last sub-question is answered in two different steps. First, an effective method of visualizing the findings of the impact analysis, as discussed mentioned in sub-question five, is sought using literature. Using the findings from literature, multiple visualizations of the impact analysis are presented to a focus group to externally validate which design carries the least amount of cognitive burden and is most effective in letting Dutch RE developers prioritize between SDA's. This results in a preliminary design of a corporate decision tool which acts as a stepping stone for further research.

2.5 Respondents

To ensure that the data generated by the surveys and interviews is representative for the market, certain measures needs to be taken. This section discusses how the respondents for the surveys and interviews are selected.

2.5.1 Survey respondents

To ensure that the data generated through the survey is statistically significant, predefined number of respondents within a certain confidence interval must respond. The population that is being addressed in this research is Dutch RE developers. According to CBS (2018), there are 97.000 employees within the construction and RE development sector. With a confidence interval of 95% and margin of error of 5%, the number of respondents necessary to make the results statistically significant are 383.

Due to the time limitations of this research 383 respondents is ambitious. Therefore, it is likely that the results are not statistically significant, however, the results can be used to draw conclusions. When the results of the survey are not statistically significant a critical analysis of the results is necessary.

To ensure as many respondents as possible, multiple methods were used to reach RE developers. An open call was done through gebiedsontwikkeling.nu[2], the survey was shared in the newsletter of MCD kennisnetwerk[3], and the network of NEOO together with a personal network was used to increase the number of respondents.

2.5.2 Interview respondents

The number of respondents in the interviews is derived from the 5 stages and emerging drivers of Senge et al. (2010), see figure 5. Section 3.2 addresses why the first and final stage of these 5 stages and emerging drivers are not taken into consideration for this research. This leaves three stages that are considered for this research. Because the stages can be used to differentiate between different RE developers regarding this research, this method will allow different perspectives towards the same questions thereby making the results more representative for the population. Due to the time limit of the research, 6-9 respondents are sought, at least two and a maximum of three respondents per stage of the three remaining stages of Senge et al. (2010). The 5 stages and emerging drivers of Senge are discussed more elaborately in section 3.2.

2.5.3 Focus group respondents

Because the focus group's goal is to provide a first impression of how a corporate decision tool should be designed and not the definitive design, 3-4 interview respondents are chosen to provide diverse insights on the topic. Due familiarity with the topic of this research, this will eliminate the necessity to explain the discussed topics prior to being able to focus on the desired outcome. Through doing so more time can be used to discuss a preliminary design of a tool.

2.6 Data plan

The infrastructure supporting the reuse of scholarly data needs significant improvement (Wilkinson, et al., 2016). Wilkinson et al. (2016), provide four guiding principles that allow this to happen. These four guiding principles are that data needs to be findable, accessible, interoperable, and reusable.

To ensure that the (meta)data is findable a unique and persistent identifier, i.e., DOI, is given in the references when possible. Furthermore all (meta)data that is referred to can be found in the section 'references' of this report.

The data of this report is accessible through the TU Delft repository and will remain accessible to the company NEOO. Certain aspects, like the report itself, remain accessible for everyone who has the access to those two platforms. Any data which cannot be made public, due to ethical considerations (see section 3.4), remains accessible by the author, and can be requested using the contact information given in the beginning of this report.

The (meta)data produced in this report is written in English to ensure that it is interoperable. Furthermore, the data produced is done using references which are noted in APA form, a recognized form of referring.

Lastly, the data is reusable when it is proven to reach a certain level when it is considered to be a master thesis worthy of finishing the master's degree Management in the Built Environment.

2.7 Ethical Consideration

The TU Delft supplies five ethical considerations derived from Field and Hole (2002) which must be considered when doing research. These ethical are informed consent, deception, debriefing, confidentiality, and protection form physical and psychological harm. Below a short description is given on how these ethical considerations are considered.

The first principle, informed consent, will be considered by informing that all participants to be involved in surveys, interviews and focus groups are not obliged to take part in any form if they do not desire to do so. Furthermore, the participants are given the opportunity to back out of any interview or survey at any point during participation. The second principle, deception, is not necessary to improve the results in this research and is therefore avoided throughout the entirety of the research. Participants are given trustworthy information so that they are well informed and not deceived. Thirdly, all participants are debriefed prior to starting any survey, interview or focus group. A general description of the overall research is given, along with a description

[2] Gebiedsontwikkeling.nu is a website that focuses on Dutch RE development and urban area development (https://www.gebiedsontwikkeling.nu/)

[3] MCD kennisnetwerk is a network of alumni from the Master City Developer frocused on sharing knowledge on urban area development (https://www.mastercitydeveloper.nl/alumni)

of the purpose of that survey, interview, or focus group. In each method of obtaining information the opportunity is given to ask questions if any part of the debriefing remains unclear. The fourth principle, confidentiality, is important in this research due to the involvement of corporate strategies. Confidentiality is achieved through not naming companies or persons other than NEOO or information that is gained through participation in forementioned research methods which can be considered harmful to them or the firm for which they operate. To ensure confidentiality in this report, respondents are referred to as respondent 1, respondent 2, etc. Lastly, all participants are protected from any form of physical and psychological harm.

2.8 The four phases of research

Prior to explaining the different steps that are taken in this research it is important to clarify the output of this research. The output of this research is a understanding of the impact of SDA's on competitiveness of Dutch RE developers. Furthermore, it supplies a stepping stone for a corporate decision tool that can help Dutch RE developers effectively prioritize between SDA's.

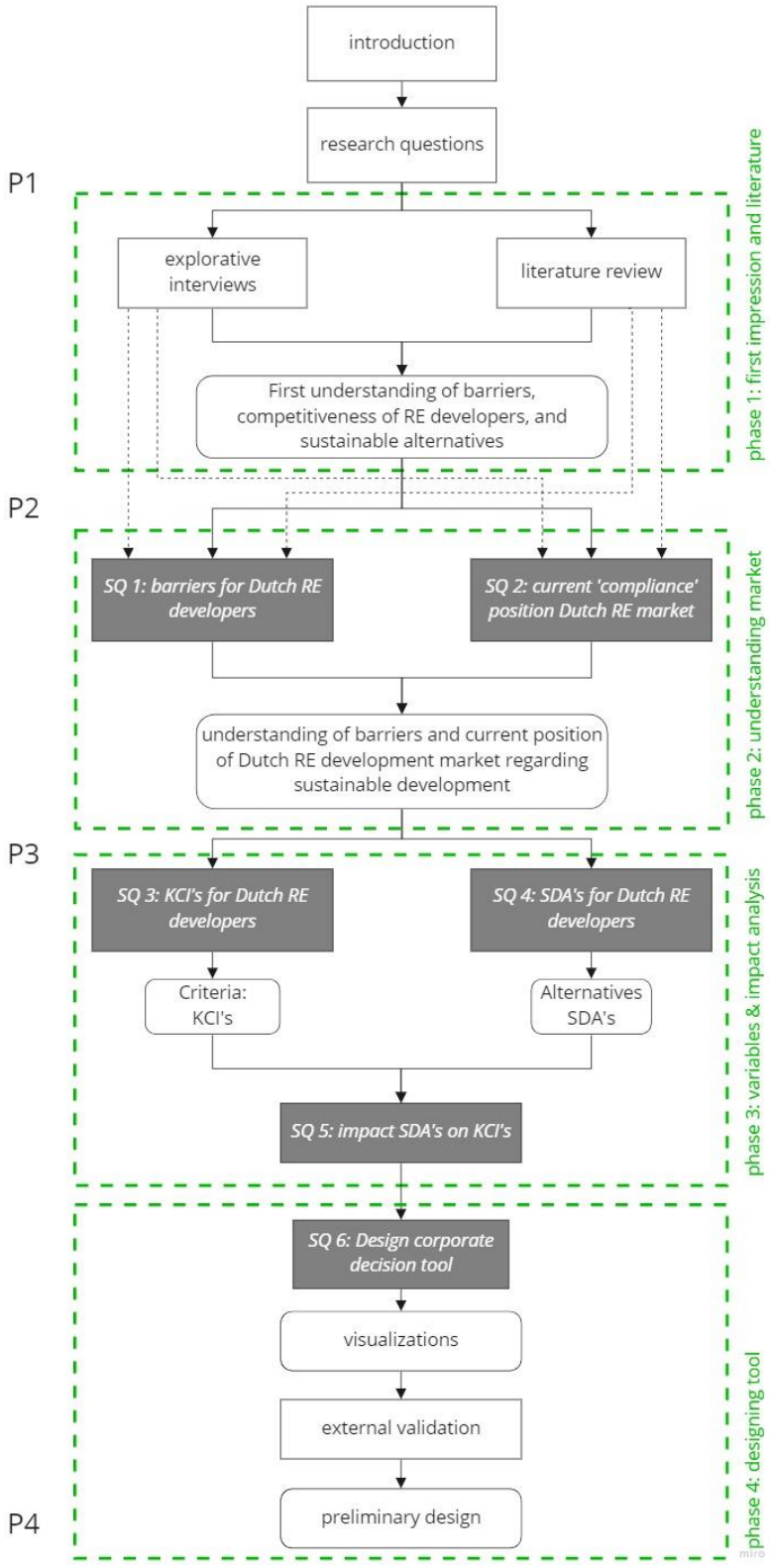

figure 3: research flow chart (own illustration)

To structure the report and research, four separate phases are identified throughout the process. The four phases are 'first impression and literature', 'understanding the market', 'variables & impact analysis', and 'designing tool'. In figure 3 an overview of the four phases is shown, furthermore, a short description per phase is provided below.

2.8.1 Phase one: First impression and literature

In phase one a first impression is gained through explorative interviews with different RE developers and a literature review. The interviews discuss the topics of current market position, barriers for sustainability, incentives for sustainability, what difference there is between highly competitive RE developers, SDA's and KCI's for RE developers. These interviews are used to gain a first understanding of the topics of this research and are used to guide process.

2.8.2 Phase two: Understanding the market

After gaining a first impression of the market, this phase aims to obtain a deeper understanding of the Dutch RE development market in relation to sustainability. Using surveys, the current market position is determined using the 5 stages and emerging drivers of Senge et al. (2010). By determining the current position of the market, the steps that need to be taken to reach phases that go beyond-compliance or further can be identified.

Furthermore, an in-depth understanding of the barriers that are currently withholding Dutch RE developers from obtaining a sustainable corporate strategy guides the research to make the output (see section 3.5) more relevant and effective for the market. It helps determine what needs to be included and excluded during the research to effectively provide a strategy decision tool for Dutch RE developers.

2.8.3 Phase three: Variables & Impact analysis

In the third phase the SDA's and KCI's are determined through literature, surveys, and semi-structured interviews. These variables are used in the MCDA (see motivation in section 4.5) to do an impact analysis of the SDA's on the KCI's, thereby determining the relations between the different SDA's and KCI's. This allows to determine to what extent and in what aspects the competitiveness of Dutch RE developers can be enhanced through SDA's.

2.8.4 Phase four: Designing Tool

The last phase of this research focuses on translating the findings from phase three to a visualization which supplies a preliminary design of the corporate decision tool. This is done through finding effective methods to visualize a MCDA and presenting these visualizations to a focus group for external validation.

3 Explanation of terms

In this section the three concepts of the main research question that require further explanation, as mentioned in section 2, are discussed. The three concepts that are explained in more depth are: sustainable development activities, beyond-compliance, and competitiveness.

3.1 Sustainable development activities

Sustainability and sustainable development are terms that are used often and with ease throughout studies, which results in making the definition ambiguous or distorted (Johnsen, Everard, Santillo, & Robert, 2007). Therefore, it is important to define what sustainable development activities means in relation to this research.

To understand 'sustainable development activities' it is important to address the definition of sustainable development. According to Johnsen et al. (2007), sustainable development can mean several things and the definitions are far from holistic. One of the most widely discussed definitions of sustainable development is that of the 1987 Brundtland report. The definition is stated as: "*…meets the needs of the present without compromising the ability of future generations to meet their own needs,*" and implies that that the only true form of sustainable progress is one that at the same time addresses the interlinked aspects of economy, environment and social well-being (World Commision on Environment and Development, 1987). The definition of Brundtland report is generally considered accurate, however it remains broad. Even though the definition is broad it does address one aspect which is important to sustainability, namely the interlinked aspects of economy, environment, and social well-being. Senge et al. (2010) address this concept as well. They mention that sustainability can only truly be achieved when the general perspective towards the environment, society and economy is changed. The economy needs to be seen as a subsidiary of nature and not the other way around. Similarly, a healthy economy cannot be achieved without a stable vibrant social order. figure 4 displays the difference between the old and new perspective.

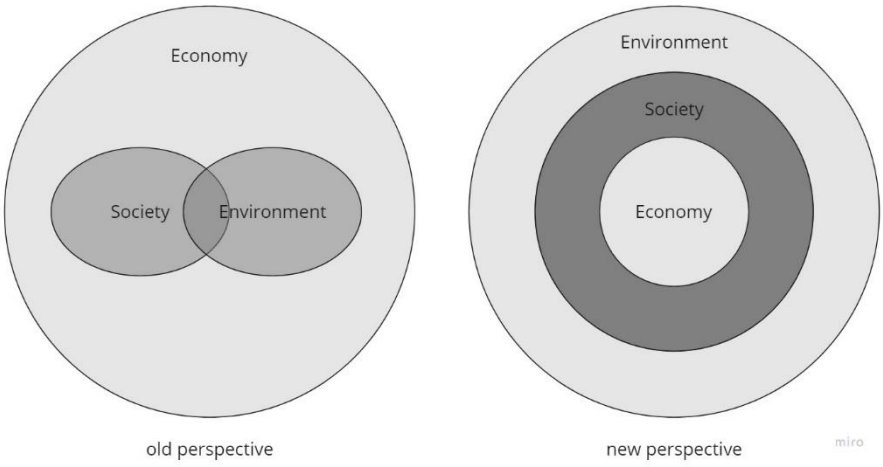

figure 4: old vs. new perspective (Senge, Smith, Kruschwitz, Laur, & Schley, 2010, p. 102)

Due to the frequent use of 'sustainability' and 'sustainable development' in combination with a lack of a holistic definition of 'sustainability', K.H. Robèrt, a Swedish scientist, defined the principles of sustainable development using back casting[4]. The result were four principles known as the 'The Natural Step Framework' (TNS) (Johnsen, Everard, Santillo, & Robert, 2007; Robèrt, 2002). Johnson et al. (2007), translated these four sustainable principles to an operational level, to make them more applicable to organizations' actions. These 4 principles are stated as follows: *"… operational sustainability principles would aim to eliminate our contribution to…*

1. *… systematic increases in concentrations of substances from earth's crust,*
2. *… systematic increases in concentrations of substances produced by society,*
3. *… systematic physical degradation of nature,*
4. *… conditions that systematically undermine people's capacity to meet their needs."* (Johnsen, Everard, Santillo, & Robert, 2007, p. 62)

[4] Determining a desired future situation and asking, "how do we get there?" (Johnsen, Everard, Santillo, & Robert, 2007)

These principles give an operational definition to the term ‘sustainable development’. An operational definition is essential because sustainable development activities for RE developers are key in this report. By using the operational definition of the four principles of TNS, it is possible to relate activities that can be implemented by RE developers to achieve a more sustainable corporate strategy.

3.2 Beyond-compliance

As stated in the problem statement it is important to make a distinction between compliance and beyond-compliance for sustainability. To understand when a RE developer is going beyond-compliance the diagram in figure 5 is used.

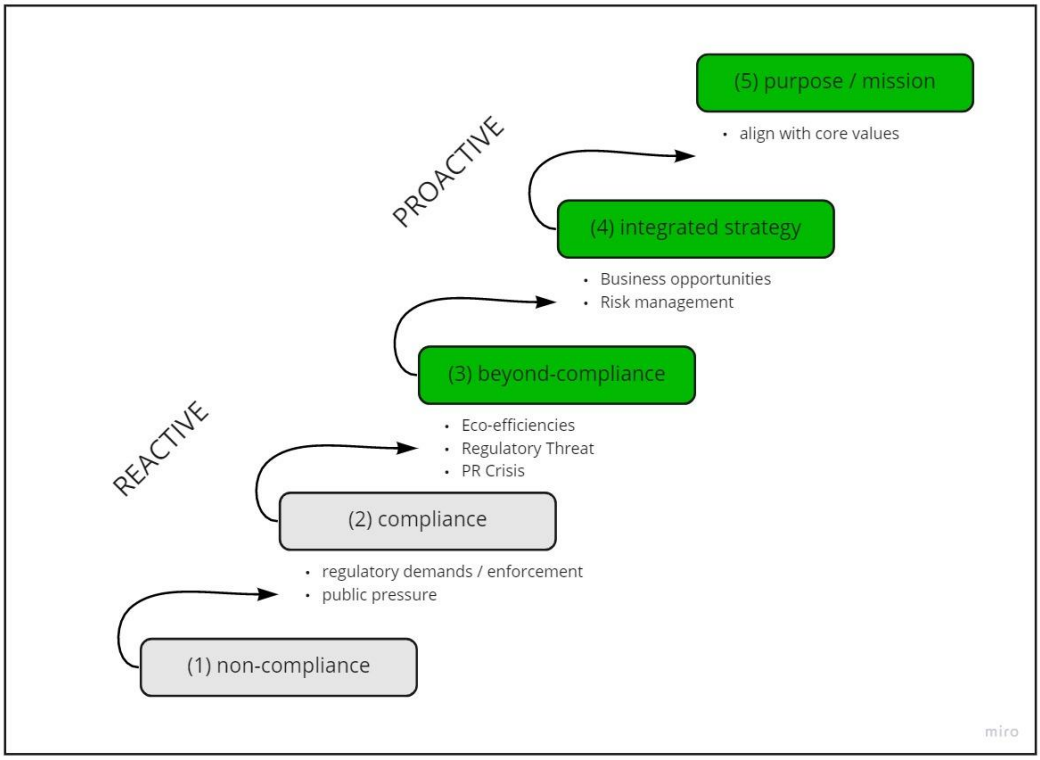

figure 5: Five Stages and Emerging Drivers (Senge, Smith, Kruschwitz, Laur, & Schley, 2010, p. 115)

From this diagram a clear distinction between compliance and beyond-compliance can be identified. It is when a company moves from the reactive phase (grey) to the proactive phase (green). According to Senge et al. (2010) many enterprises get stuck in the reactive phase of sustainability where there is no-compliance, or they are reacting to external factors. Reacting to external factors, such as an NGO picketing your corporate offices, is an expensive way of changing a business strategy. Therefore, managers of these enterprises often assume that making the step to beyond-compliance or further is expensive as well.

To be able to determine in what phase of figure 5 a company finds itself, a short overview of characteristics has been given in table 3.

table 3: characteristics of different stages (Senge, Smith, Kruschwitz, Laur, & Schley, 2010, pp. 114-116)

Phase	Characteristics
Non-compliance	- Reacting to external pressures
Compliance	- Reacting to external pressures - Meeting minimum legal requirements in areas such as air emissions, toxic waste, and wastewater
Beyond compliance	- Cost effectiveness of beyond-compliance has been realized. - Payoffs begin to far outweigh their initial investments. This can lead to a so-called snowball effect where the reinvestment of original savings leads to more gains, including branding and reputation.
Integrated strategy	- Sustainability is fully integrated into strategy. - Proactively integrate sustainability factors into every dimension of their business strategy and organization - Business leaders (CEO's, CFO's, etc.) have sustainability as a domain. - Sustainability is at the heart of the corporate strategy and implementation. - Sustainability directly impacts capital and budget allocations, supply chains, the pursuit of major new markets, core operations, and R&D
Purpose / mission	- Often founded by individuals who saw the opportunities sustainability challenges before most companies started aiming for compliance. - Boldly declaring that (often without passing through prior stages) the mission or purpose of the company is to contribute to society and be regenerative.

In short, SDA's that are going beyond-compliance are therefore proactively going beyond the minimum legal requirements set by the Dutch government. As indicated in table 3, the last phase is hard to obtain without changing the core business of an entity. This would suggest that a RE developer would not develop real estate anymore but would solely focus on the mission to improve sustainability in general. Because this research is focused on the sustainability of RE developers this phase is unlikely to be addressed in the rest of the research.

3.3 Competitiveness

This research focuses on improving the competitiveness of Dutch real estate developers by means of sustainability, which in the end can lead to a competitive advantage. Therefore it needs to be clarified what competitiveness and a competitive advantage is.

Prior to understanding competitive advantage, it is important to understand the concept of competition. As a result of an empirical study Vera Li (2011) identifies four dimensions of competition. These four dimensions are displayed in the table below (see table 1).

table 4: four dimensions of competition (Li, 2011)

Dimension 1: Competitors	**Dimension 2: Competing Objects**
"This means those with whom you will be competing, including existing and potential competitors." (Li, 2011, p. 31)	"This is the specific object of competition, which includes such things as profits, market share, material sources, ideas and innovation, service networks, customer satisfaction." (Li, 2011, p. 31)
Dimension 3: Competitive Capability	**Dimension 4: Competed Results**
"Independent interested individuals demonstrate their special characteristics and abilities during the competitive process. The greater quality or ability one has, the greater the chance of success as compared with one's competitors." (Li, 2011, p. 31)	"The result of competing is a reasonable allocation of competing object among competitors. If the results are not mutually satisfactory, competition will continue." (Li, 2011, p. 31)

The cycle of competition often continues, as explained in dimension four. Throughout this repeating cycle an organization will improve their ability to compete (Li, 2011).

Gaining a competitive advantage through strategic thinking is a widely discussed subject for many years and throughout these years different definitions of the concept have been given. Kevin P. Coyne (1986) describes a competitive advantage or strategy as: "*defeating competitors and achieving dominance in a product/market segment. It is thus – in concept, and usually in practice – a subset of business strategy, which addresses the broader goal of maximizing the wealth of stakeholders*." He goes on to explain that a competitive advantage is meaningful when three distinct conditions are met; (1) buyers notice a significant positive difference between the producer and its competitors, (2) that difference is a result of a capability gap between the producer and its competitors, and (3) both these aspects can be expected to be endured over time. Smith & Flanagan (2006) describe competitive advantage as something that separates the enterprise from others and keeps it alive and

growing. Furthermore, V.K. Ranjith (2016), describes a competitive advantage as something that gives an entity the ability to propel growth and above all something that creates value to its shareholders.

When analyzing these definitions (and others) it becomes clear that a competitive advantage is subject to three key elements. First, a competitive advantage needs to allow a company to grow and thrive. Second, the competitive advantage needs to positively influence the stakeholders at hand. This is logical because the stakeholders, like clients for private developers, are affected by the strategic choices made when utilizing a competitive advantage. Third, a competitive advantage positively differentiates one organization from another.

Having a competitive advantage is becoming more difficult for parties due to strong competitive pressure, and the fact that technologies and information are hard to distinguish from one another and can easily be reproduced (Goldsmith, 2013; Singh P. K., 2012). Furthermore, contextual constraints and trends, like the costs of sustainable products, within the environment are making it difficult to maintain a competitive advantage (Sołoducho-Pelc, 2014).

Moreover, it is important to note that a competitive advantage primarily comes from the resources within the company itself. It is the competitive advantage that makes a business successful, and the sources of the competitive advantage should be hard to be reproduced by competitors within the same market, thereby making it a lasting competitive advantage (Sołoducho-Pelc, 2014).

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Phase one: First impressions & literature

First findings from literature

Image source: https://www.bangor.ac.uk/courses/undergraduate/2021/3p3q-english-literature-and-film-studies

4 literature review

To understand the forementioned topics and why private RE developers might seek to go beyond-compliance regarding sustainability to improve competitiveness, certain aspects must be analyzed more in-depth. This chapter analyzes existing literature to gain a deeper understanding of the subject prior to executing the research and answering the research questions.

4.1 Assumption of positive relation between sustainability and competitive advantage

The main research question in this report relies on the assumption that competitiveness can be enhanced through implementing SDA. Therefore, it must be clarified why it is reasonable to assume this.

In general, there are two opposite perspectives towards sustainability, namely, a traditionalist view and a revisionist view (Cai & Li, 2018; Hussain, Rigoni, & Cavezzali, 2018; Triebswetter & Wacklerbauer, 2008). The traditionalist view is characterized by a perspective where sustainability is seen as a cost-driver due to the high costs and complicated solutions that are involved (Cai & Li, 2018; Palmer, Oates, & Portney, 1995; Walley & Whitehead, 1994). In other words, the win-win situation of sustainability is seen as a utopia. In the traditionalist view it is thought that the increasing costs, risks, and insufficient government support cause a negative effect on the competitiveness of firms (García-Sanchez, Gallego-Álvarez, & Zafra-Gómez, 2019). In contrast, the revisionist view, argues that the sustainability innovations do have the capability to generate win-win situation and increase the competitiveness of firms (Porter & van der Linde, 1995).

In association with the revisionist view, Hermundsdottir and Aspelund (2020) provide four different arguments that sustainability gives the possibility of improving the competitiveness of a firm. First, sustainability innovation can improve the efficiency of processes due to a decrease in the use of raw materials, energy, and resource consumption (Ciou, Chan, Lettice, & Chung, 2011). Secondly, utilizing sustainable innovation can lead to a higher quality product (Dey, Malesios, De, Chowdhury, & Abdelaziz, 2019). Thirdly, sustainable innovation can lead to an improvement of managerial processes by using assessment methods to identify and realize cost savings (Hojnik, Ruzzier, & Manolova, 2018). Finally, sustainable innovation allows to exploit opportunities to answer to the wishes of an increasing number of customers with a desire for sustainable solutions (García-Sanchez, Gallego-Álvarez, & Zafra-Gómez, 2019; Lin, Tan, & Geng, 2013).

The notion that sustainability can positively influence a competitive advantage is confirmed by other studies as well. It has been proven that environmental management practices can lead to innovation which in turn lead to a competitive advantage (Chang, 2011; Chen, Lai, & Wen, 2006). Also, a positive influence on the competitive performance of a firm via sustainability is recognized in image and relational marketing (Jorge, Madueño, Martínez-Martínez, & Sancho, 2015). The same effect extents to the relational capacity of a firm (Madueño, Jorge, Conesa, & Martínez-Martínez, 2016), and customer satisfaction (Saeidi, Sofian, Seaidi, Saeidi, & Saaeidi, 2015) n. JLL (Jones Lang LaSalle), also provide an overview of the market drivers for sustainability. Based on their research these market drivers include:

- Increasing shareholder value and building value
- Tenant attraction and retention
- Staff attraction and retention
- Government reduction target and accommodation criteria
- Demand for quality space
- Reduced operating costs
- Pressure from stakeholders and shareholders
- Demand for SRIs (socially responsible investment)
- Global reporting and disclosure projects
- Risk mitigation and good governance
- Legislative changes
- Escalating cost of resources
- Brand protection
- Corporate social responsibility
- Increased global focus on climate change (JLL, 2007)

Besides the general notion that sustainable development can improve a firm's competitiveness from literature, it can also be recognized in the Dutch RE market. An increasing number of firms embracing sustainability in their corporate strategy have gained a competitive advantage. During explorative interviews, it became clear that firms that are not obtaining sustainability in their day-to-day processes might even be in danger of losing their competitive edge completely. This idea is also confirmed by P. Senge (2010); ""…more and more corporations in every industry are incorporating sustainability and social responsibility issues into their goals for the future. They have accepted that they must do so if they wish to survive and thrive in the tumultuous times ahead."

All in all, from both research and practice it can be concluded that not only SDA's can positively influence the competitive advantage of an enterprise, not including it in their corporate strategy might lead to losing a competitive edge entirely. For these reasons it is reasonable to assume that implementing SDA's can lead to a competitive advantage for Dutch RE developers.

4.2 Barriers for obtaining a sustainable corporate strategy

To understand what is keeping Dutch RE developers from obtaining a sustainable corporate strategy the barriers need to be identified. This section aims to find barriers that are keeping RE developers in general from becoming more sustainable which are used in phase 2 of the research to help understand what is keeping Dutch RE developers from implementing a more sustainable strategy.

According to Regales (2017), financial barriers are causing the most impact on keeping RE developers from becoming more sustainable. The financial barriers can be, for example, split-incentives, high costs and time delay. This is especially present in the use of BREEAM. Furthermore, legislative, knowledge and organizational barriers can also turn into financial barriers due to the time and costs that are related to these barriers.

She also indicates that knowledge barriers, like the lack of experience with BREEAM and other sustainability calculations models are considered to significantly impact the sustainability in corporate strategies of RE developers. Due to this lack in experience and the time necessary to learn such methods and calculations the knowledge barriers can lead to financial challenges.

The legislative barriers that are found were also often in association with the use BREEAM. Regales states that this is likely due to the lack of experience from public parties. A more frequent collaboration from private and public parties could help to resolve this issue.

Lastly, organizational barriers are identified by regales as well, however, she states that these did not play a large role in her research most likely due to the involved organizations. Literature, however, states that the organizational barriers should not be underestimated. Therefore, they are considered in this research as well.

Prior to her research Regales (2017) identified 19 barriers from literature which are displayed in the table below.

table 5: list of financial, legislative, knowledge, and organizational barriers for Dutch RE developers (Regales, 2017)

Type of barrier	**Examples**
Financial	Sustainability measures are too costly
	No access to financing
	Lack of suitable business cases
	Risks perception
	Split-incentive
	Short term view / involvement
Legislative	Regulations
	Lack of flexibility by law and regulations
	Lack of ambition / vision for sustainability
	Protest / objections form actors
Knowledge	Lack of knowledge, awareness, or expertise
	Insufficient support for research, learning and pilot projects
	Insufficient transfer of knowledge
	Lack of knowledge concerning BREEAM
Organizational	Lack of coordination within and between different organizational level
	Sectoral responsibility versus collective interest
	Lack of leadership capacity and know-how for complex, cross-sectoral process
	Lack of courage
	Lack of support / direction

In other research, Zhang, Shen, Wu, and Qi (2011) identify a different list of barriers. The list has similarities, however, there are some notable barriers which are not obtained in the list provided by Regales (2017). In table 6 the addressed barriers of the research done by Zhang et al. (2011) are displayed.

table 6: barriers to obtain CS for RE developers (Zhang, Shen, Wu, & Qi, 2011)

Barriers for implementing a more sustainable strategy (Zhang, Shen, Wu, & Qi, 2011)
High green appliance design and energy-saving material costs
Insufficient policy implementation efforts
Technical difficulty during construction process
Risks involved because of different contract forms of project delivery and changed site practices and behaviors
Lengthy planning and approval process for new green technologies and recycled materials can be lengthy
Lack of knowledge and awareness to the green technologies
Lack of integrated inefficiency for the building regulations and byelaws within the green framework
Lack of motivation from customer's demand
Unfamiliarity with green technologies makes delays in the design and construction process
Interests conflicts between various stakeholders in using green measures

The first notable difference with the list of Regales is the inclusion of technical barriers. Technical difficulties can, for example, play a role in the redevelopment of buildings. Secondly, another notable difference is that external organizational factors are considered as well. For example, the interests conflict between various stakeholders plays a role in this as well. This is important to mention because in most (re)development projects the project organizations are temporal yet dependent on each other, therefore the support of partners plays a large role as well.

Another international study done by Williams & Dair (2007) indicates a variety of barriers withholding British RE developers from becoming more sustainable. The list of barriers is displayed in the table below along with the incidence of the barrier.

table 7: Barriers to achieving sustainability in England (Williams & Dair, 2007)

Barrier to acting sustainably	**Incidence of the barrier**
Sustainability measure was not considered by stakeholders	By far the most commonly recorded barrier
Sustainability measure was not required by client (includes purchasers, tenants, and end users)	Commonly recorded
Stakeholder had no power to enforce or require sustainable measure (in some cases it was the responsibility of the client or the contractor)	Commonly recorded
One sustainability measure was forgone in order to achieve another (traded)	Commonly recorded
Sustainable measure was restricted, or not allowed, by regulators	Commonly recorded
The sustainability measure cost too much (in some cases the investor would not fund)	Commonly recorded
Sustainable measure was not available	Commonly recorded
An unsustainable measure was allowed by the regulator or statutory undertaker (so no impetus for a sustainable alternative to be used)	Infrequently recorded
Stakeholder was not included, or was included too late, in the development process to implement sustainability measure	Infrequently recorded
Stakeholder lacked information, unawareness, or expertise to achieve sustainable measure	Infrequently recorded

Even though the barriers that are indicated are applicable to England, they all apply to the Dutch market as well. In the table provided by Williams & Dair (2007) it is interesting to find that technical barriers and external organizational barriers are included as well.

4.2.1 Conclusion

Due to the reason that research of Regales (2017) is most applicable to the Dutch market and the most recent, it is used as a foundation for the barriers which are used in the survey in phase 2 of the research. Because in both the tables provided by Williams & Dair (2007) and Zhang et al. (2011) both technical and external organizational barriers could be identified these are added to the barriers for phase 2 of the research. table 8 shows the barriers which form the basis for the survey in phase 2 of the research.

table 8: overview of barriers from literature (own table)

Type of barrier	#	Examples	source
Financial	1	Sustainability measures are too costly	(Regales, 2017)
	2	No access to financing	(Regales, 2017)
	3	Lack of suitable business cases	(Regales, 2017)
	4	Risks perception	(Regales, 2017)
	5	Split-incentive	(Regales, 2017)
	6	Short term view / involvement	(Regales, 2017)
Legislative	7	Regulations	(Regales, 2017)
	8	Lack of flexibility by law and regulations	(Regales, 2017)
	9	Lack of ambition / vision for sustainability	(Regales, 2017)
	10	Protest / objections from actors	(Regales, 2017)
Knowledge	11	Lack of knowledge, awareness, or expertise	(Regales, 2017)
	12	Insufficient support for research, learning and pilot projects	(Regales, 2017)
	13	Insufficient transfer of knowledge	(Regales, 2017)
	14	Lack of knowledge concerning BREEAM	(Regales, 2017)
Organizational (internal)	15	Lack of coordination within and between different organizational level	(Regales, 2017)
	16	Sectoral responsibility versus collective interest	(Regales, 2017)
	17	Lack of leadership capacity and know-how for complex, cross-sectoral process	(Regales, 2017)
	18	Lack of courage	(Regales, 2017)
	19	Lack of support / direction	(Regales, 2017)
	20	Sustainability measure was not considered by stakeholders	(Williams & Dair, 2007)
	21	Stakeholder had no power to enforce or require sustainable measure (in some cases it was the responsibility of client or the contractor)	(Williams & Dair, 2007)
Organizational (external)	22	Sustainability measure was not required by client	(Williams & Dair, 2007)
	23	Sustainable measure was restricted, or not allowed, by regulators	(Williams & Dair, 2007)
	24	Stakeholder was not included, or was included too late, in the development process to implement sustainability measure	(Williams & Dair, 2007)
	25	Risks involved because of different contract forms of project delivery and changed site practices and behaviors	(Zhang, Shen, Wu, & Qi, 2011)
	26	Interest conflicts between various stakeholders in using green measures	(Zhang, Shen, Wu, & Qi, 2011)
Technical	27	Site conditions mitigated against the use of a sustainable measure	(Williams & Dair, 2007)
	28	Inadequate, untested, or unreliable sustainable materials, products, or systems	(Williams & Dair, 2007)
	29	Sustainable measure was not available	(Williams & Dair, 2007)
	30	Technical difficulty during the construction process	(Zhang, Shen, Wu, & Qi, 2011)

4.3 Competitiveness of real estate developers

Prior to being able to assess to what extent the competitiveness of Dutch RE developers can be improved through implementing SDA's, it needs to be understood how the competitiveness of RE developers can be measured. This section aims to provide an understanding of how competitiveness can be measured and what components determine the competitiveness of RE developers.

There are two major challenges when understanding the competitiveness of different firms in general. First, individual firms are structured and focused individually, this makes it difficult to compare, for example, one RE developer to another. Second, measuring competitiveness among different entities can be difficult in a dynamic market (Zhang, Shen, Wu, & Fan, 2009). However, an in-depth assessment of the competitiveness of a firm allows to determine its competitive advantage over another firm, a key element in this research. Thus, a clear understanding of how the competitiveness of a Dutch RE developer can be measured needs to be obtained.

4.3.1 Strategy of assessing competitiveness

Zhang et al. (2009) provide numerous ways for assessing Chinese RE organizations' competitiveness. One of these methods, which is most applicable to this research, is the 'weighted summation (WS) and key competitiveness indicators (KCI's). In this method numerous competitiveness indicators are adopted together with a weighted index value to be able to calculate how competitive a firm is. Based on the research of Zhang et al. (2009), a WS and KCI's are proven to be effective measures for assessing the competitiveness of real estate enterprises. This method of assessing the competitiveness is aligned with this research, considering the output

as mentioned in section 3.1. Therefore, the first step to assessing the competitiveness of RE developers is finding the KCI's for RE developers. The weighted index is determined using surveys in phase three of the research.

4.3.2 Key competitiveness indicators (KCI's)

Using an indicator approach, Zhang et al. (2009) indicate 24 typical competitiveness indicators for enterprises in general. This is done through analyzing 91 relevant works published through the period of 1973-2007. The results from this analysis are displayed in the figure below.

Indicators			
I_1 – Brand Assets	I_7 – Entrepreneurial Quality	I_{13} – Information Technology	I_{19} – Production Efficiency
I_2 – Core Competence	I_8 – Financial Assets	I_{14} – Knowledge Assets	I_{20} – Productivity
I_3 – Cost Advantage	I_9 – Firm Structure	I_{15} – Manufacture Capacity	I_{21} – Profitability
I_4 – Cultural Assets	I_{10} – Human Resources	I_{16} – Market Process	I_{22} – Quality Control
I_5 – Customer Satisfaction	I_{11} – Human Resources Management	I_{17} – Market Share	I_{23} – Uniqueness of Product
I_6 – Distinctive Competitive Strategy	I_{12} – Innovation Action	I_{18} – Organization learning	I_{24} – Value Creation

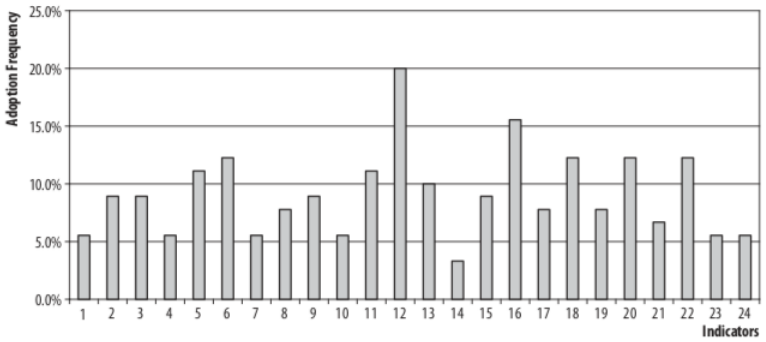


figure 6: general KCI's for enterprises (Zhang, Shen, Wu, & Fan, 2009)

These indicators give a clear understanding of what KCI's might entail for RE developers. It is important to note that the indicators displayed in figure 6 are not specified to RE enterprises but are general KCI's for firms. Therefore, a set of KCI's applicable to RE developers needs to be sought.

Zhang et al. (2010), also provide a list of KCI's for Chinese RE developers along with five core competitiveness indicators in further research. 43 KCI's are identified using the forementioned 91 KCI's in combination with a study on the China business competitiveness monitor system and a research report on the Chinese top 10 RE listed developers (Zhang, Shen, Wu, & Ping, 2010). The 43 KCI's which are identified are listed in table 9.

table 9: 43 KCI's for Chinese RE developers (Zhang, Shen, Wu, & Ping, 2010)

Group	Indicator
Resources (R)	Corporate brand awareness
	Annual land reserves
	Access to a diverse range of capital
	Availability of consumer community resources
	Availability of rich human resources: effective staff promotion
	Availability of extensive real estate policy information; many information channels
	Favoring support from planning department
	Relationship with government
	Sound organizational culture
	Knowledge of market information channels and relevant market strategy
	Expert team organized for forecasting and analyzing consumer market
	Availability of long-term strategic partner (construction, design, supervision, and property management, etc.)
Mechanism (M)	Effective corporate ownership
	The innovation and reform on organizational structure
	Reasonable equity structure, which promote the sustained development of organization
	Availability of mature decision-making mechanism
	Appropriate incentive mechanism

	Rational surveillance and restraint mechanisms on senior managers
	Effective coordination mechanism with the related upstream and Autonomous and flexible market-oriented operation mechanism downstream enterprises
	Autonomous and flexible market-oriented operation mechanism
Capability (C)	Good at expanding finance channels and cash liquidity
	Good at making investment analysis and orientation in the project feasibility stage
	No major investment mistakes in recent three years
	Entrepreneurship (e.g., top leaders with resolute determination and quick response to tell new market opportunity, superior strategic management capacity)
	Scientific and rational use of capital budgeting and planning capabilities
	Sensitive risk prediction, assessment, and response capacity
	Good team collaboration capability
	Business marketing ideas, strategies and marketing schedule control can get maximum benefit
	Scientific market research before the real estate project
	The capability to grasp the latest market trends and characteristics of design concepts
	Good at promoting the selling point of real estate project timely and effectively
	Establishment of a specialized database of targeted consumers in time for effective communication and coordination
	Sound and efficient organizational management capacity
	Development of green corporate brand; conduct green strategy to gain social responsibility
	Knowledge of change in market environment and market trend in good time
	Efficient land pricing strategy and success rate of land bidding
	Excellent value chain integration capability
	The smoothly access to relevant government departments' real estate project approval
	Strict and efficient quality control and planning capability
	Rational and clear corporate business schedule control
	Good inter-departmental co-ordination capacity
	Effective cost control methods and capabilities

The research continuous to identify five core competitiveness indicators using a survey distributed amongst academics and professionals. The five core competitiveness indicators that are found for the Chinese RE developers' market are annual land reserves, corporate brand awareness, access to diverse range of capital, entrepreneurship, sensitive risk prediction, assessment and respond capacity, and lastly, development of green corporate brand (Zhang, Shen, Wu, & Ping, 2010). These competitiveness indicators are researched within the Chinese RE market, however, they can apply to RE development markets in general. The last core competitiveness indicator yet again proves that obtaining a sustainable corporate strategy can lead to a competitive advantage.

In another study, Li (2011) provides an overview of KCI's that are, again, applicable to Chinese RE developers. These indicators are a result of a literature review in combination with the features of the real estate industry and are displayed in the figure 7. She uses different perspectives to categorize a RE developer's competitiveness, namely, management competency, organizing competency, technological capabilities, financial competency, market share, social responsibility, and regional competitiveness.

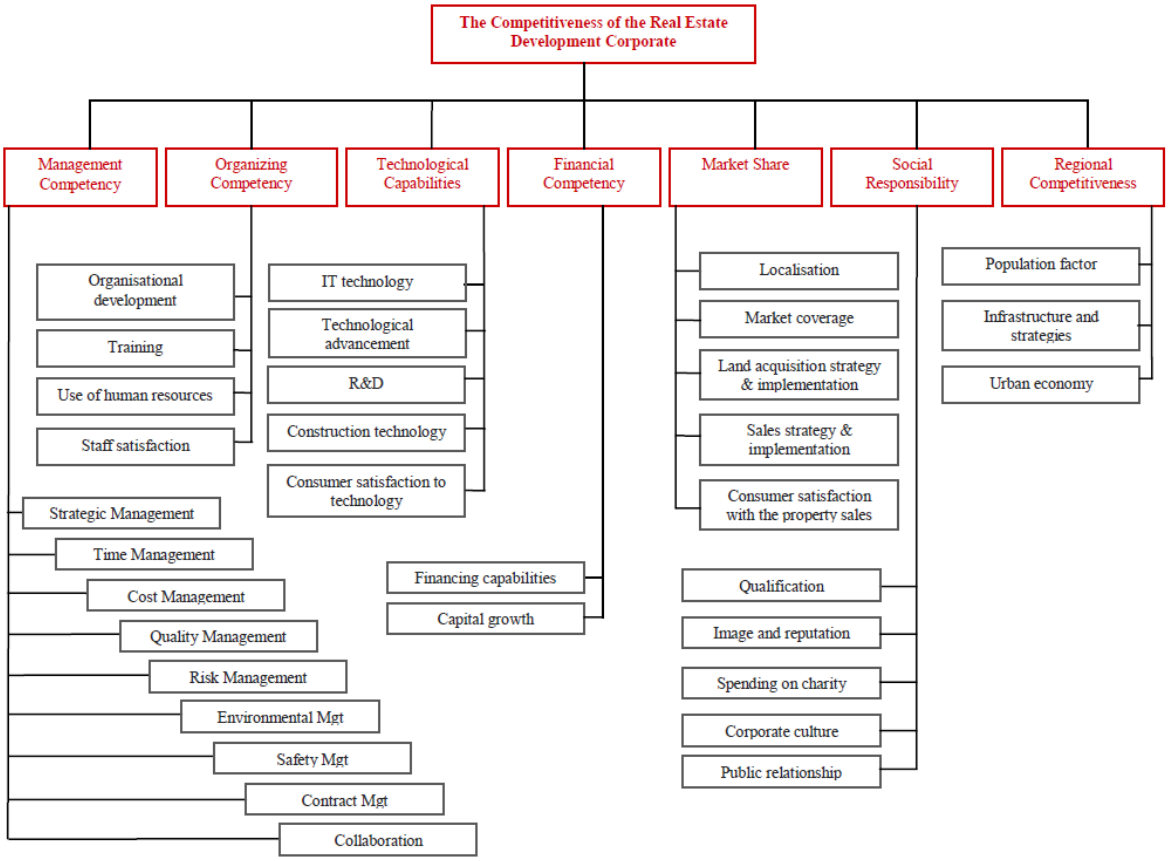


figure 7: competitiveness indicators, criteria, and attributes for assessing real estate developers in China (Li, 2011)

Each of the different perspectives contribute to the competitive competency, one of four competition elements, in a different manner (Li, 2011). To understand each of the perspectives a short description is provided below.

Management competency concerns the capability to achieve the set goals and objectives by using the available resources efficiently and effectively. These include strategic management, time management, cost management, quality management, risk management, and more. Secondly organizing competency concerns the capability of motivating people to act in a certain manner within an organization. In other words, this perspective focuses mainly on the human resources and in-house capability of a firm. Thirdly technological capabilities concern aspects such as IT technology, technological advancement, R&D capability, construction technology and consumers' satisfaction to technology. The financial competency of a firm is reflected by it's financing capabilities and capital growth. Considering that the RE development market of private RE developers is financially motivated this perspective plays a significant role in the competitiveness of the firms. The fifth aspect is the market share of RE developer. The market share is good representation of the presence of a RE developer in the market in which it finds itself. A larger presence can be considered to result in a highly competitive competency of a firm. The sixth perspective is that of social responsibility. As mentioned by P. Senge and V. Li, CSR is considered as an effective method of improving the corporate's public image, mitigating ethic risk, and leverage the awareness of a brand. When taking this into account, CSR can also be considered as a perspective to improve the competitiveness of a RE developer. Lastly, regional competitiveness, can be considered as the competitiveness within a certain area, geographically speaking. This perspective is taken separately because a firm's level of competitiveness might be considered extremely high in a certain area, however, if there is little to no competition in that area, it implies that the overall level of competitiveness is not as great as it seems (Li, 2011).

4.3.3 Conclusion

Besides the studies of Zhang et al. (2010) and Li (2011), most studies addressing the KCI's of RE developers also concern the Chinese development market. This is remarkable and indicates the need for further research applicable to the Dutch RE market.

Because the studies are mainly done in China there are significant similarities between the results. Even though the results of Li (2011) are translated to a more general and categorial overview, the similarities with the results of Zhang et al. (2010) can be recognized. The categorial and more general approach fits the time and the scope of this research more adequately. Therefore, the model provided by Li (2011) is used as the basis for the research done in phase three.

4.4 Sustainable development activities

In section 3.1 the term sustainable development activity (SDA) is defined, this section summarizes the different SDA's that are found in literature. Due to the time constraint on this research, all the individual sustainable actions have been categorized using the following umbrella terms:

- Green product development
- Green supply chain management
- Green human resource management
- Green marketing
- Green facility management

The SDA's group different sustainable actions that can be taken by Dutch real estate developers. The reason why this can be done is because the competitive yield is unlikely to differ significantly. For example, actions such as developing circular buildings and developing BREEAM 'outstanding' buildings might be different actions on their own but are highly likely to yield the same effect on the competitiveness of a RE developer. Analyzing each of those actions separately does not fit the timeframe of this research, therefore further research is required. Below the principles, and what actions are considered for those principles, are explained. The list of SDA's is used as a basis for the interviews in the fourth phase of this research.

4.4.1 Green product development

The first SDA is developing green product, or in other words, developing sustainable buildings. Sustainable products, or buildings, can be achieved in a multitude of ways and are generally scored using different assessment methods or 'sustainability scores'. Due to the high importance of sustainability in todays society, simply stating that a development is 'green' is not good enough. To be able to measure to what extent a development is green, scoring systems such as BREEAM, LEED, and WELL have been adopted. The different scoring systems measure sustainability in different assessment categories (van Driel & van Zuijlen, 2016).

The assessment categories of BREEAM, LEED, and WELL are displayed in the table below.

table 10: BREEAM, LEED, WELL, Green rating, assessment categories (van Driel & van Zuijlen, 2016)

BREAAM, LEED, WELL, Green rating, assessment categories			
BREAAM	LEED	WELL	Green rating
Energy	Energy atmosphere	Air	Energy
Water	Water efficiency	Water	Water
Materials	Materials and resources	Light	Waste
Transport	Location and transportation	Fitness	Transport
Waste	Sustainable sites	Comfort	Well being
Pollution	Innovation	Mind	
Health and well being	Indoor environmental quality	Nourishment	
Management	Integrative process		
Land use & ecology	Regional priority credits		
	Smart location and linkage (ND)[5]		
	Neighborhood pattern & design (ND)		
	Green infrastructure & buildings (ND)		

When analyzing table 10, it becomes clear that the assessments of the different assessment categories are (nearly) all product related. Also, there are many similarities between the assessment categories, therefore, all these actions are considered to be part of the SDA, green product development.

[5] The categories that are followed by (ND) are only taken into account for Neighborhood Development (van Driel & van Zuijlen, 2016)

Another action to develop sustainable products is integrating circularity into a project. Circularity is still a growing trend in the built environment (personal communication H. Luijt, 18 December 2020). Circularity can be achieved in multiple ways as indicated in figure 8.

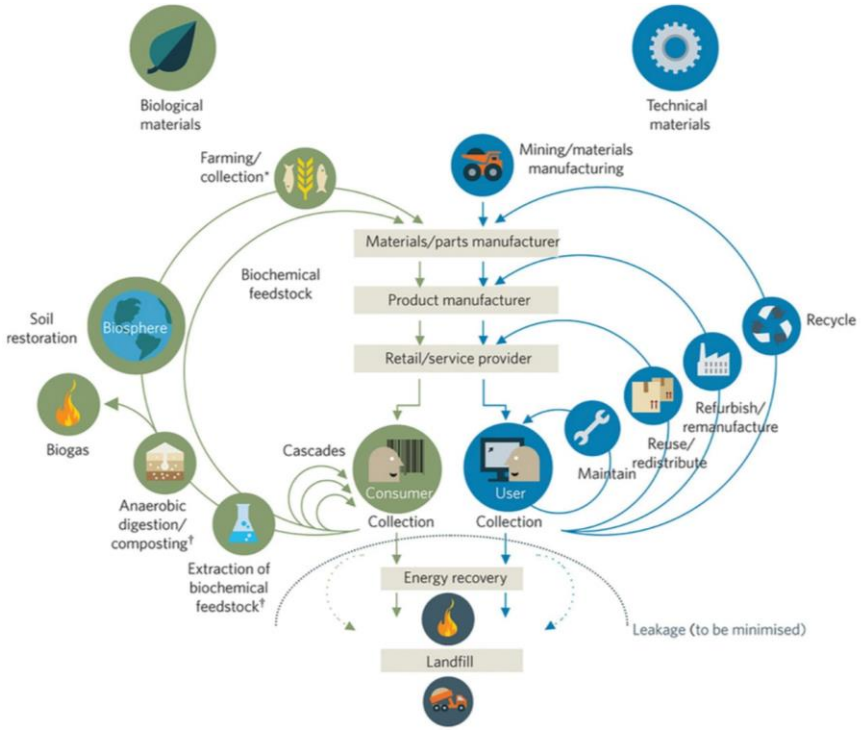


figure 8: the circular economy (Ellen Macarthur Foundation, 2013)

The figure shows the different possible ways of developing in a circular manner. The right-hand side (blue) of the figure primarily indicates what can be done in the built environment. Maintenance can be used to extent the lifetime of a building, materials can be reused or redistribute, building can be (partly) refurbished or remanufactured, and building components can be recycled (Ellen Macarthur Foundation, 2013).

Circularity can be calculated using an MPG (Milieu Prestatie Gebouw) calculation. MPG is yet another important method of assessing the sustainability of a building and is integrated into BREAAM-NL (Rijksdienst voor Ondernemend Nederland, 2020). It is important to note that an MPG assessment is mandatory in every environmental permit in the Netherlands.

Another action for green product development is minimizing the pressure on transportation. Currently transport is causing 10% of the CO_2 emissions in the EU (Kaklauskas, Zavadskas, Dargis, & Bardauskiené, 2015). According to Kaklauskas et al (2015), the presence of people in highly concentrated areas cause not only a negative effect on the health of the inhabitants, but also largely contribute to the greenhouse effect. In other words, this is causing a systematic increase of substances produced by society (see section 4.4).

During the explorative interviews it was also mentioned that the emphasis on a sustainable transportation plan was insignificant compared to other SDA's (personal communication, E. Koot, 11 December 2020). The reasoning behind this could be that transportation is represented by only a limited amount in the scores such as BREAAM (see section 4.4.1). For example, for a newly constructed building, only 6% of the total BREAAM-NL score is represented by transportation (BREEAM-NL, 2020). This is remarkable when taking the data into account displayed in figure 9.

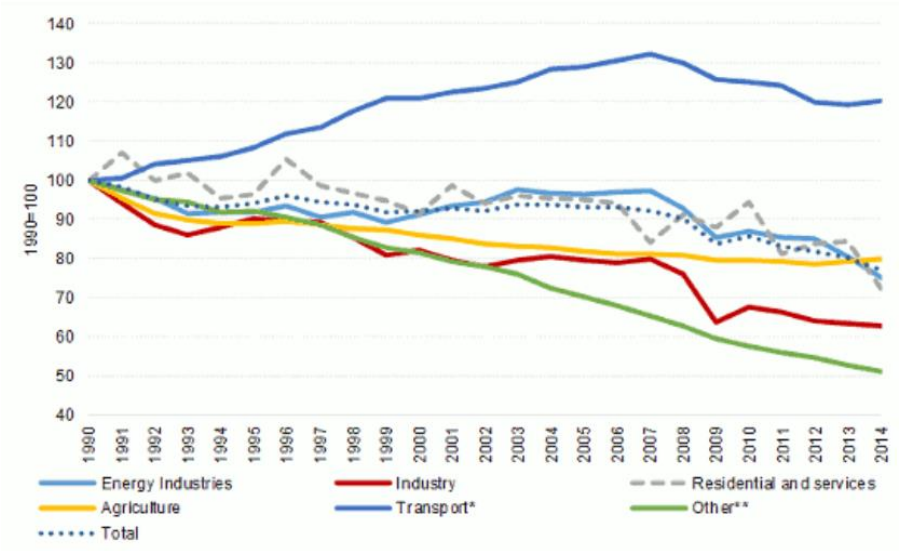


figure 9: evolution of greenhouse gas emissions by sector (1990 = 100), EU28 (European Commission, 2016)

The graph above shows the emissions of different sectors (blue = transport) using the year 1990 as a baseline (European Commission, 2016). As displayed in the graph transport has not seen a gradual decline in emissions such as the other sectors. Furthermore, transportation emissions have not gone below the level measured in 1990, which all the other sectors have done.

RE developers play a role in this as well. A large part of transportation is determined by the location of where a person needs to go. By choosing tactical locations for RE, developers can contribute to minimizing the emission of transportation (E. Koot, personal communication, 11 December 2020). For example, locating offices in the proximity of a railway station can motivate employees to use public transportation means such as the train. Other initiatives are gaining more attention as well. Shared transportation means are becoming more popular, companies like Greenwheels[6] have already started initiatives where they are supply shared cars for RE projects (Greenwheels, 2020).

Lastly another action that can be taken to achieve green product development is developing flexible buildings. The world around us is constantly changing and with those changes come altering demands for real estate. The pace at which the demand changes is generally done quicker than the pace at which real estate changes, creating a mismatch between user's demands and the real estate supply (Mexis, 2020). Therefore, more flexible solutions in real estate need to be sought, preventing buildings from becoming obsolete. By giving insight into what flexible solutions are possible, much like this research, Y. Mexis (2020) shows that it can be prevented that buildings become obsolete and create dynamic RE portfolios that contribute to a more adaptable, and thus, a more sustainable built environment.

4.4.2 Green supply chain management

Another SDA, which came forward during the explorative interviews, was working with sustainable partners (personal communication, H. Luijt, 18 December 2020), or as referred to in literature, green supply chain management (GSCM). Working with sustainable partners can be done by, for example, involving contractors who share a desire to develop in sustainable matter. Logically, through working with parties who share a desire for sustainable development, sustainability can be assured in different aspects and facets of a project. Also, GSCM is a crucial part for encouraging organizational sustainability (Sarkis & Gallhofer, 2011; Rath, 2013)

According to Kafa, Hani, and El Mhamedi (2017), the implementation of sustainable practices is affected by various external factors which are controlled by other stakeholders. Also, the realization of sustainable initiatives is an intricate task without the cooperation and coordination of all partners in the supply chain network. Therefore, the correct selection of sustainable partners can lead to an improvement in an organization's

[6] A Dutch transportation company supplying shared cars in urban areas.

sustainable performance. Furthermore, Murphy and Bendell (1997), argue that business-environmental group partnerships are on of the key strategies required to put sustainable development into practice. Business-environmental group partnerships are those that exist between a profit driven organization, i.e., RE developer, and non-profit organizations, i.e., NGO supporting sustainable development. In their research they state that an engaging in social interaction will improve the chances of forging a common sense of purpose towards sustainability.

4.4.3 Green Human resource management

Another SDA that can be considered is green human resource management (GHRM). Human resource management has been found critical for creating employee commitment to corporate social responsibility and corporate sustainability and integrating those principles into an organization (Stahl, Brewster, Collings, & Hajro, 2020). Different activities that are driving CSR and CS are value-based recruitment and selection, training, employee development, talent management, performance management, and incentive systems which are in accordance with the corporate sustainability strategy which is or will be implemented by a firm (Cohen, Taylor, & Müller-Camen, 2012; Slack, Corlett, & Morris, 2015).

Other research confirms the findings of a positive affect of human resource management in CS. In a study investigating the interplay of green transformational leadership, green HRM and green innovation on environmental performance, it was found that green HRM positively affect green innovation. Furthermore, it was also found that the GHRM indirectly, through green innovation, positively influence the environmental performance of a firm (Singh, Giudice, Chierici, & Graziano, 2020).

According to Singh et al. (2020), GHRM practices are key in acquiring, developing, and sustaining employees who have a sustainable mindset and help the firm compete with competitors through green processes and products. This result is also recognized in the Dutch RE development market. Employees who are motivated to act in a 'green' or sustainable matter are likely to improve the environmental performance of the firm. Furthermore, when more employees are hired who are intrinsically motivated to improve an organization's environmental performance it is likely that they will continue to influence each other to positively affect the corporate sustainability, leading to a possible continuous growth in this topic (personal communication H. Luijt, 18 December 2020).

4.4.4 Green profiling and marketing strategy

Using CSR and CS in a marketing strategy is another SDA that can used to become more sustainable as a RE developer (Heurkens & Buskens, 2017). Using a case study on the King's Cross project in London Heurkens & Buskens (2017) show that marketing a development firm as sustainable can lead to involvement in more sustainable projects and can increase trust with other stakeholders. Even though this case was in London, this SDA came forward in the exploratory interviews for Dutch RE developers as well (P. Horst, personal communication, 06 January 2021). Using sustainability as a marketing tool can therefore become a self-fulfilling prophecy, in which marketing is used as an indirect tool to become more sustainable.

It is key that the marketing does lead to becoming more sustainable otherwise it does not contribute to this research. 'Green' marketing is also often used to portray a certain image of a firm which is not true, this concept is referred to as 'greenwashing'. Greenwashing is defined by the Cambridge dictionary as "to make people believe that your company is doing more to protect the environment than it really is" (Cambridge Dictionary, 2021). Therefore, this SDA can only be considered as an SDA if a company does become more sustainable because of the marketing.

4.4.5 Green facility management

Green facility management can be achieved in two different manners, internal or external. Internal green facility management focusses on the day-to-day operations of Dutch RE developers and doing that with a sustainable mindset. This can be achieved through sustainable housing of the office, reduce the use of the cars, reduce the use of paper, separating waste, and more. External green facility management applies to developers who choose the remain owner of the building after developing it. In this case the RE developer can create sustainable investments and contribute to a sustainable culture of the building's users.

4.4.6 Conclusion

During the literature review of the SDA's it became clear that many SDA's and actions that fit those SDA's still need to be sought in practice, therefore, interview respondents were asked to add actions or SDA's to list if necessary. Furthermore, during the exploratory interviews an in-depth conversation was needed to identify SDA's for Dutch RE developers. For this reason, an overview of the SDA's is likely to contribute to helping certain

RE developers understand the concept of sustainability and indicate how a corporate sustainable strategy can be implemented.

Further knowledge from practice is required for this research. However, the table below indicates the first findings for possible SDA's that can be implemented by Dutch RE developers which are derived from literature.

table 11: first SDA's and actions based on literature review (own table)

SDA	SDA
Green Product development	Maximize score on BREEAM
	Maximize score on LEED
	Maximize score on WELL
	Maximize score on Green Rating
	Integrate circularity into development
	Develop flexible buildings
	Minimize effect on transport
Green Supply Chain Management	Work with sustainable parties in project teams
	Business-environmental group partnerships (NGO)
Green Human Resource Management	Value-based recruitment (focus on sustainability)
	Employee training
	Employee development
	Talent management
	Performance management
	Incentive systems in accordance with the corporate sustainability strategy
Green profiling and marketing strategy	Profile company as 'sustainable'
	Emphasize on sustainability in online marketing
	'spreading the word'
Green facility management	Act in a sustainable manner within the company
	Invest in sustainability in personal investments (ownership)

4.5 Effective decision making

One of the goals of this research is to make a preliminary design of a corporate decision tool that allows Dutch RE developers to prioritize between SDA's which can act as a stepping stone for further research. This section aims to find an effective measure to perform an impact analysis between the two variables of this research, SDA's and KCI's. The diverse SDA's are alternatives which can be implemented by Dutch RE developers to enhance the competitiveness of the firm. The convergent process of choosing between different alternatives, or SDA's, reflected against several criteria, or KCI's, is referred to in literature as 'concept selection' or multi-criteria-decision analysis (MCDA). It is important to have an effective concept selection method because early mistakes can rarely be compensated at later stages in a process (Kremer, 2008).

This section analyses three concept selection methods and concludes with the model that is most adequate for this research with an argumentation. All the concept selection methods that are considered are designed to allow a multi criteria (KCI's and SDA's) selection and include a weighted index for variables. The weighted index is required, as mentioned in section 4.3.1, to effectively measure the competitiveness of Dutch RE developers (Zhang, Shen, Wu, & Fan, 2009). The typical steps that are taken in these multi criteria analyses are displayed in table 12.

table 12: Steps in a multi-criteria analysis (Communities and Local Government, 2009)

Step	**Action**
1	Establish the decision context. What are the aims of the MCA, and who are the decision makers and other key players
2	Identify the options
3	Identify the objectives and criteria that reflect the value associated with the consequences of each option
4	Describe the expected performance of each option against the criteria. (if the analysis is to include steps 5 and 6, also 'score' the options, i.e. assess the value associated with the consequences of each option)
5	'Weighting'. Assign weight for each of the criteria to reflect their relative importance to the decision.
6	Combine the weights and scores for each of the options to derive and overall value
7	Examine the results
8	Conduct a sensitivity analysis in scores or weights

4.5.1 House of Quality

Terharr et al. (1993), developed a concept selection method called the 'house of quality'. figure 10, displays how the method can be applied. The rows of the selection method can be considered as the KCI's, with their allocated weighted index, while the columns can be considered as the diverse SDA's that can be implemented by Dutch RE developers. In the 'roof' of the matrix the compatibility between the different concepts is displayed as well. The compatibility between each of the concepts can be important to consider because if more than one concept can be implemented the total effect has the chance to increase (Terharr, Clausing, & Eppinger, 1993).

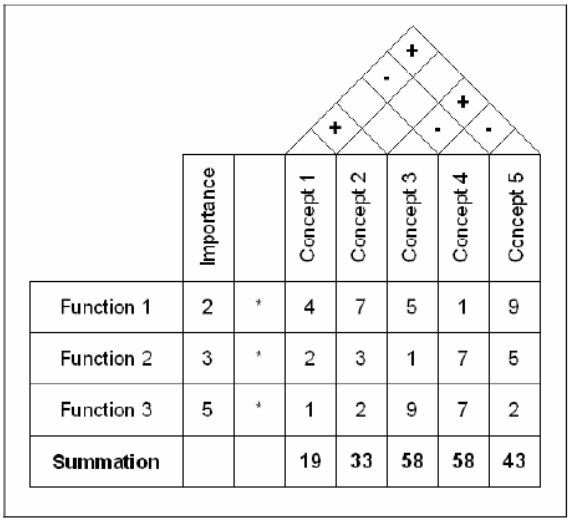


figure 10: 'House of Quality' concept selection method (Terharr, Clausing, & Eppinger, 1993)

Even though the original selection method was designed to map customer requirements into engineering characteristics (Kremer, 2008), the concept can also be applied to this research.

4.5.2 Analytical Hierarchal Process (AHP)

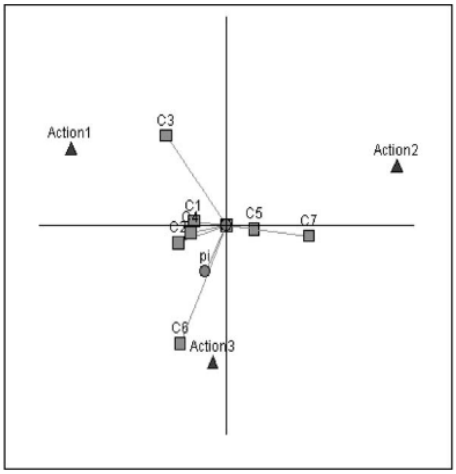
In AHP the focus lies on finding a solution that best suits the goal and the understanding of the problem instead of attempting to find a single definitive correct solution. AHP allows to create a comprehensive rational framework for structuring the solution to a problem (Majumder, 2015).

First the problem is broken down into a set of more comprehensive sub-problems, or in this case, criteria. By comparing the criteria with one another, a hierarchy can be made to allow the decision maker to systematically decide which criteria are key to the problem. In making these comparisons concrete data or judgements on the relative meaning and importance of each of the elements can be used. After having created a valuation, the results need to be translated to numerical values that can be compared over the entire range of the problem. AHP distinguishes itself from other techniques by allowing diverse and often incommensurable elements to be compared with one another. In the final step of the process, numerical priorities are calculated for each of the decision alternatives. The numerical priorities are based on the ability of that option (SDA) to meet the set goal (improve competitive advantage) (Majumder, 2015).

4.5.3 Weights assessment and sensitivity analysis

A weights assessment and sensitivity analysis measures to which extent certain actions influence a set of performance criteria and can also be applied for successful concept selection (Dulmin & Mininno, 2003). In relation to this research these certain actions can be considered as the SDA's and the performance criteria can be considered as the KCI's.

Dulmin & Mininno (2003) provide an example on how weights assessment and sensitivity analysis can be used by applying the concept selection method to supplier selection. In figure 11, the example is shown using a table with the output of the data and a graphical representation using a Gaia-chart, note that the weight assessment is not displayed in the table, yet is taken into account.



Criteria	C1	C2	C3	C4	C5	C6	C7
Min/max	Max	Min	Min	Min	Max	Max	Max
S1	50%	30	10	12	0	Moderate	Bad
S2	10%	38	14	15	2	Low	Good
S3	30%	32	16	13	1	High	Average

figure 11: weight assessment and sensitivity analysis example (Dulmin & Mininno, 2003)

The results of the table are translated to a Gaia-chart in which all the options (action 1, 2, and 3) are displayed together with the results of all the criteria (C1-C7). The Gaia-chart enables a reader to quickly analyze what action should be taken when taking one or more criteria into account. This is useful if one or more criteria do not have to be considered for the decision. Regarding this research, this could be applied when a Dutch RE developer is already performing well in a certain KCI and therefore does not have to take that certain KCI into account.

4.5.4 Conclusion

Each of the above-named concept selection methods can be applied to the research and take a weighted index of the criteria into consideration, therefore they are aligned with successfully determining competitiveness of a firm as described by Zhange et al. (2009).

The HOQ method is similar to the weighted assessment and sensitivity analysis, however, it takes the interdependencies between the different SDA's into consideration. This aspect could be interesting for further research but is not included in the scope of this research. When this aspect is not considered the HOQ method becomes weighted assessment with a sensitivity analysis.

The AHP method is also applicable yet relies on finding a hierarchy of solutions to a single situation. As mentioned before, firms have a strategy specific to their firm. When deciding on a hierarchy to a single situation, the research is only applicable to firms that find themselves in that situation, thereby decreasing the practical relevance.

For those reasons, the weighted assessment and sensitivity analysis is chosen to translate the findings of this research into a corporate decision tool. This method fits within the scope of the research and allows to consider multiple situation simultaneously by producing a matrix of solutions where SDA's are tested against weighted criteria and translated to a graphical overview of the solutions.

The empty MCDA is displayed in figure 12. The MCDA is used to gain insight towards what the impact is of the SDA's on the KCI's that together form the competitiveness of Dutch RE developers.

What is the impact of SDA's on the KCI's		KCI's							
		KCI 1	KCI 2	KCI 3	KCI 4	KCI 5	KCI 6	KCI 7	
		,00 (weighted index)	,00 (weighted index)	,00 (weighted index)	,00 (weighted index)	,00 (weighted index)	,00 (weighted index)	,00 (weighted index)	
SDA's	SDA 1	impact	impact	impact	impact	impact	impact	impact	0,00
	SDA 2	impact	impact	impact	impact	impact	impact	impact	0,00
	SDA 3	impact	impact	impact	impact	impact	impact	impact	0,00
	SDA 4	impact	impact	impact	impact	impact	impact	impact	0,00
	SDA 5	impact	impact	impact	impact	impact	impact	impact	0,00

figure 12: empty MCDA (own illustration)

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Phase two: Understanding the market

Barriers withholding Dutch RE Developers & Current market ‘compliance’ position

Image source: https://www.google.com/search?q=barriers&tbm=isch&tbs=isz:l&rlz=1C1SQJL_enNL924NL924&hl=nl&sa=X&ved=0CAEQpwVqF

5 Barriers for Dutch RE Developers

This chapter answers the first of six sub-questions in this research, "*What are the barriers that are withholding Dutch RE developers from implementing a more sustainable corporate strategy?"* To answer this sub-question a literature review was done and explained in section 4.2. The output of the literature review is a list of 30 barriers categorized in six categories. The table which was adopted for the survey is displayed below as well.

table 13: Barriers adopted in survey (own table)

Type of barrier	#	Examples	source
Financial	1	Sustainability measures are too costly	(Regales, 2017)
	2	No access to financing	(Regales, 2017)
	3	Lack of suitable business cases	(Regales, 2017)
	4	Risks perception	(Regales, 2017)
	5	Split-incentive	(Regales, 2017)
	6	Short term view / involvement	(Regales, 2017)
Legislative	7	Regulations	(Regales, 2017)
	8	Lack of flexibility by law and regulations	(Regales, 2017)
	9	Lack of ambition / vision for sustainability	(Regales, 2017)
	10	Protest / objections from actors	(Regales, 2017)
Knowledge	11	Lack of knowledge, awareness, or expertise	(Regales, 2017)
	12	Insufficient support for research, learning and pilot projects	(Regales, 2017)
	13	Insufficient transfer of knowledge	(Regales, 2017)
	14	Lack of knowledge concerning BREEAM	(Regales, 2017)
Organizational (internal)	15	Lack of coordination within and between different organizational level	(Regales, 2017)
	16	Sectoral responsibility versus collective interest	(Regales, 2017)
	17	Lack of leadership capacity and know-how for complex, cross-sectoral process	(Regales, 2017)
	18	Lack of courage	(Regales, 2017)
	19	Lack of support / direction	(Regales, 2017)
	20	Sustainability measure was not considered by stakeholders	(Williams & Dair, 2007)
	21	Stakeholder had no power to enforce or require sustainable measure (in some cases it was the responsibility of client or the contractor)	(Williams & Dair, 2007)
Organizational (external)	22	Sustainability measure was not required by client	(Williams & Dair, 2007)
	23	Sustainable measure was restricted, or not allowed, by regulators	(Williams & Dair, 2007)
	24	Stakeholder was not included, or was included too late, in the development process to implement sustainability measure	(Williams & Dair, 2007)
	25	Risks involved because of different contract forms of project delivery and changed site practices and behaviors	(Zhang, Shen, Wu, & Qi, 2011)
	26	Interest conflicts between various stakeholders in using green measures	(Zhang, Shen, Wu, & Qi, 2011)
Technical	27	Site conditions mitigated against the use of a sustainable measure	(Williams & Dair, 2007)
	28	Inadequate, untested, or unreliable sustainable materials, products, or systems	(Williams & Dair, 2007)
	29	Sustainable measure was not available	(Williams & Dair, 2007)
	30	Technical difficulty during the construction process	(Zhang, Shen, Wu, & Qi, 2011)

A full overview of the survey can be found in *appendix A – survey* and a full overview of the answers in *appendix B – survey results.* The respondents were asked to indicate to what extent they agree or disagree on whether the barriers are stopping Dutch RE developers from obtaining a more sustainable corporate strategy. The barriers in the survey were given in a random order and did not include the barrier categories, to prevent bias. The following sections discuss the results of the survey based on the responses of 31 respondents.

5.1 Category average scores

In the survey the respondents were asked to rate barriers on a scale from -2 to 2 (see table 1). The figure below shows the average score of each of the categories as mentioned in table 13.

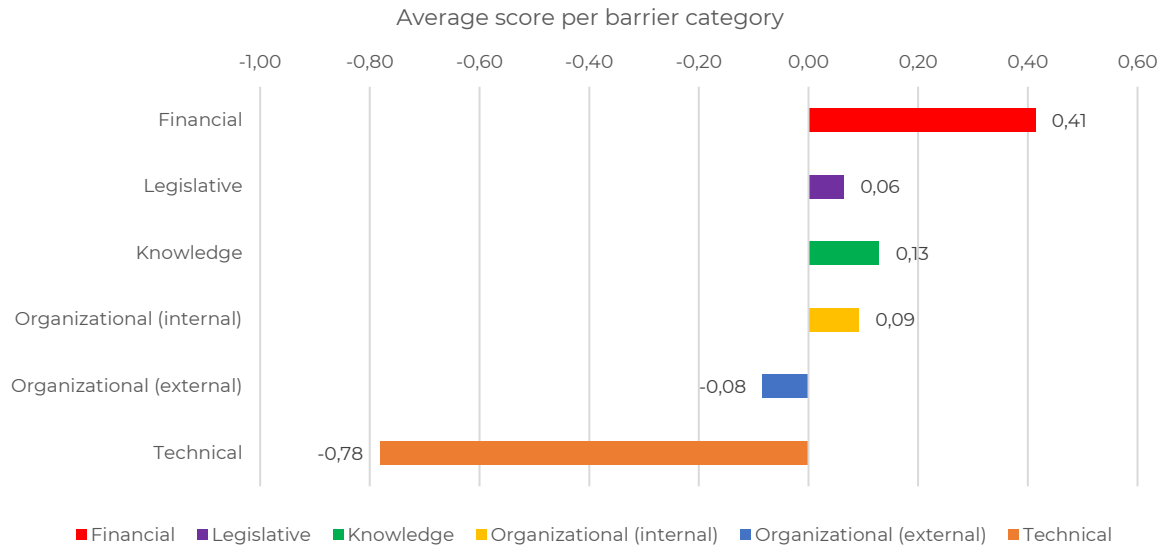

figure 13: average score per barrier category (own illustration)

When positive scores were measured among the respondents it indicated that the barrier was considered to be present for RE developers, and is therefore withholding them from implementing a sustainable corporate strategy. When a negative score was measured, it indicates that the barrier was not stopping them from implementing a more sustainable corporate strategy.

When analyzing figure 13, it becomes clear that two categories stand out, the financial barriers and the technical barriers. Relatively to the other categories of barriers, financial barriers are contributing significantly to keeping Dutch RE developers from implementing a more sustainable strategy. On the other hand the technical barriers are not contributing to the problem. The other three categories of barriers average around zero points where RE developers neither agree nor disagree with the statements that the barriers are withholding them from implementing a more sustainable corporate strategy. To draw an accurate conclusion the barriers need to be analyzed on an individual level, done in section 5.2

5.2 Individual barrier scores

The figure below shows the results of the survey per barrier. Each of the barriers have been assigned a color to indicate in which category they belong.

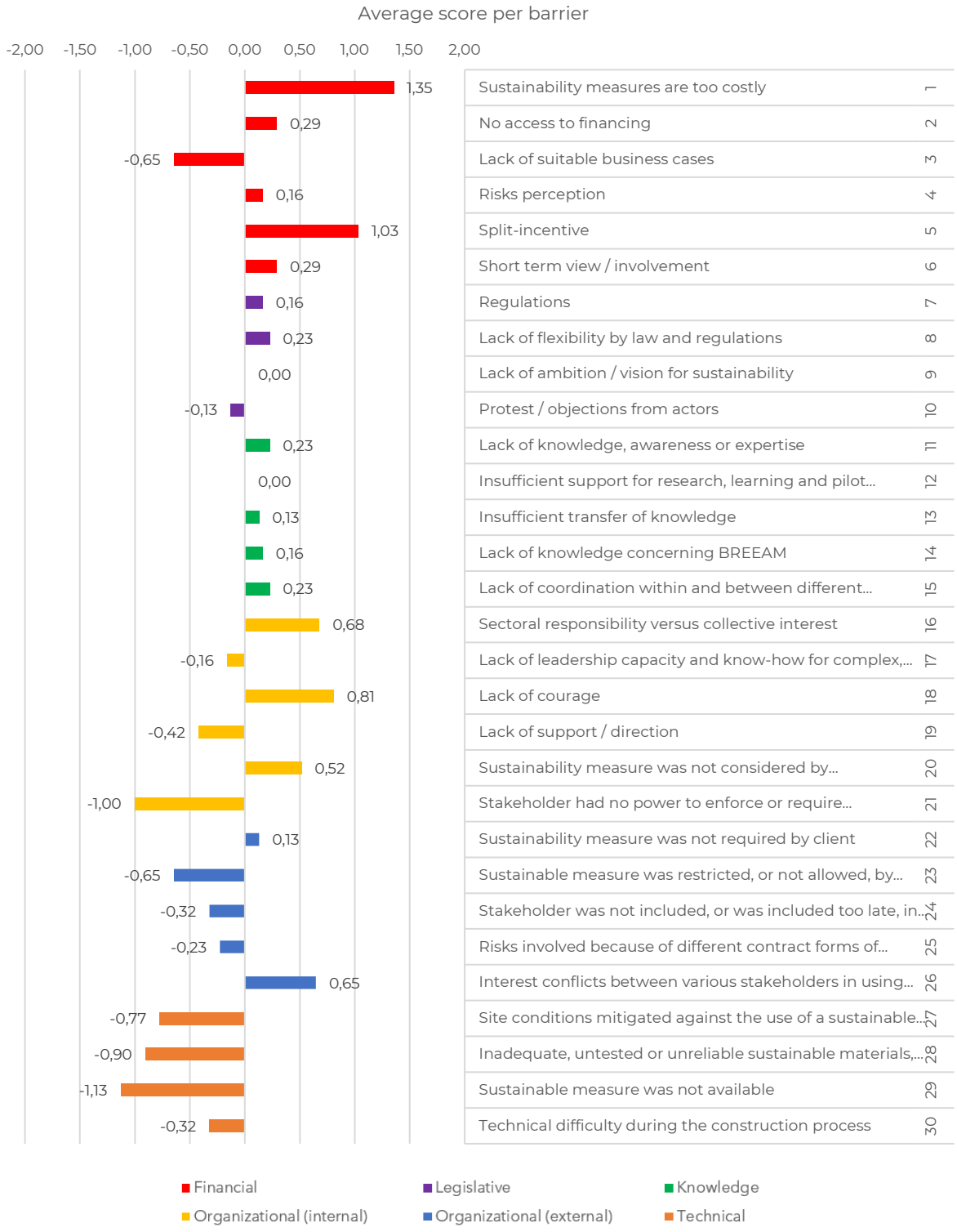

figure 14: Average score per barrier (own illustration)

Exhibiting the scores of each individual barrier allows a more in-depth analysis. Below each category of barriers is discussed separately. In section 5.3 the total conclusion of the analysis is provided.

Of all the categories, as indicated in section 5.1, the financial barriers have the largest contribution to preventing Dutch RE developers form obtaining a more sustainable corporate strategy. The only financial barrier that was found to not keep Dutch RE developers from obtaining a more sustainable corporate strategy was the lack of suitable business cases. This is interesting because the cost of sustainable measures, access to financing and the split-incentive, that contribute to those business cases, were found to form barriers towards obtaining a more sustainable corporate strategy. During the explorative interviews and interviews the financial barriers were named numerous times as well. It was found that the direct profit from implementing sustainable measures often did not outweigh the investments.

All barriers from both the knowledge- and legislative categories were rated neutral by the respondents of the survey. This indicates that the respondent did both not agree nor disagree whether these barriers were keeping them from implementing a more sustainable corporate strategy. Therefore, these barriers are present, yet do not have a significant impact on Dutch RE developers.

The next category, internal organizational barriers (yellow), shows that the results from the individual barriers are diverse. There are three barriers in this category that do not seem to keep Dutch RE developers from obtaining a more sustainable corporate strategy, namely, lack of leadership and know-how for complex cross-sectoral processes, lack of support / direction, and the lack of power to enforce or require sustainable measures. The score of -1,00 clearly indicates that a Dutch RE developer does not lack power to implement a sustainable measure. The other two negative scores, lack of leadership and lack of support / direction, are both related to leadership within the firm itself. This shows that management of Dutch RE Developers also support the movement towards a more sustainable corporate strategy. On the contrary, this category also has 3 barriers that do keep Dutch RE Developers from implementing a sustainable corporate strategy. These barriers are sustainability measure was not considered by stakeholders, lack of courage, and sectoral responsibility versus a collective interest. The discrepancy between these barriers, that of a positive and negative score, can be explained with a trend that is recognized throughout the rest of the results as well. Dutch RE developers seem to have the means, apart from financially affordable solutions, to implement a more sustainable corporate strategy, however, the willingness to implement such a sustainable corporate strategy seems to be lacking.

The external organizational barriers (blue), based on these results, generally also do not seem to form a large obstruction for implementing a more sustainable corporate strategy. However one barrier does seem to stop Dutch RE developers from implementing a more sustainable strategy, namely, a conflict in interest between different stakeholders in the project. To find out what stakeholders have a different view towards sustainability further research is needed. The difference in interest shows that not all stakeholders are willing to invest in sustainability, which makes it difficult because nearly all projects are developed with multiple parties. Another barrier that stands out is that the sustainability measure was not required by the client. The reason why this stands out is because, as mentioned earlier (see section 1), more and more sustainable solutions are sought (JLL, 2020; JLL, 2019; CBRE Research, 2020). These results could be due to the smaller number of respondents. In general, apart from a difference in interest between stakeholders, it can be stated that external organizational influences due not form a barrier for implementing a more sustainable corporate strategy for Dutch RE developers.

The results of the technical barriers (dark orange) show that Dutch RE developers are not being kept from implementing a sustainable corporate strategy due to the availability or technical difficulty of sustainable solutions. All the barriers resulted with a negative score in the survey. This shows that the sustainability measures are available and can be implemented by Dutch RE developer. The technical barriers address the product related sustainability measures.

5.3 Conclusion

The sub-question that is answered by this section of the survey is stated as follows: "*What are the barriers that are withholding Dutch RE developers from implementing a more sustainable corporate strategy?*" Based on the findings of the survey it can be stated that the barriers that are keeping Dutch RE developers from implementing a more sustainable corporate strategy are mostly financial. Furthermore, it was found that sectoral

responsibility, a lack of courage, consideration of sustainable solution within the project team, and a difference in interest between stakeholders are also keeping Dutch RE developers from obtaining a mores sustainable strategy. All these barriers, besides the financial barriers, are organizational, both internal and external.

It is also interesting that the technical-, knowledge-, and legislative barriers did not seem to have a substantial impact on preventing Dutch RE developers from implementing a sustainable corporate strategy. This shows that the tools necessary to become more sustainable are present, however, mostly due to financial reasons, the necessary steps to becoming more sustainable are not being taken.

As indicated in the introduction, respondents of the survey were given the opportunity to provide extra barriers that were not included in the survey with a score which was aligned with the existing scoring system. Three suggestions for barriers were made:

1. The financial added value is missing. Currently the only added value is environmental / societal (CO_2 reduction).
2. Not prioritizing sustainability in projects.
3. Sustainability aspects are hard to appraise financially in the built environment.

The first barrier was not given a score and the second and third scored 'agree' (1). Because these barriers were only mentioned once in the provided responses, they are not taken into account for this research. Further research is necessary to determine if these barriers play a large role in withholding Dutch RE developers from becoming more sustainable.

6 Current 'compliance' position

In this section the second sub-question of the research is discussed. The sub-question is stated as follows: "*What is the current 'compliance' position of Dutch RE developers in relation to sustainability?"* The sub-question, as mentioned in section 2.4.2, is answered using existing literature and the survey which was also used to answer the firs sub-question of this research discussed in section 5.

The respondents of the survey were asked to determine the compliance position using the 5 stages and emerging drivers of Senge et al. (2010), displayed in figure 5. The position that was asked to be determined was that of an average Dutch RE developer to ensure that bias of their own firm was prevented. The reason why bias can occur in this part of the research is due to respondents portraying the sustainability of their own firm as too high, often referred to as greenwashing. Furthermore, asking the respondents to choose for the average Dutch RE developer's position allows a broader perspective towards the total position of the market. With a total of 31 respondents this allows to gain an understanding of the market's position with a relatively small sample.

To inform the respondents on the five different stages a short description was given using table 14, see appendix A – survey for a full description of this section. Each of the respondents was asked to select one of the five phases.

table 14: description 5 stages and emerging drivers (Senge, Smith, Kruschwitz, Laur, & Schley, 2010)

Phase	Characteristics
Non-compliance	- Reacting to external pressures
Compliance	- Reacting to external pressures - Meeting minimum legal requirements in areas such as air emissions, toxic waste, and wastewater
Beyond compliance	- Cost effectiveness of beyond-compliance has been realized. - Payoffs begin to far outweigh their initial investments. This can lead to a so-called snowball effect where the reinvestment of original savings leads to more gains, including branding and reputation.
Integrated strategy	- Sustainability is fully integrated into strategy. - Proactively integrate sustainability factors into every dimension of their business strategy and organization - Business leaders (CEO's, CFO's, etc.) have sustainability as a domain. - Sustainability is at the heart of the corporate strategy and implementation. - Sustainability directly impacts capital and budget allocations, supply chains, the pursuit of major new markets, core operations, and R&D
Purpose / mission	- Often founded by individuals who saw the opportunities sustainability challenges before most companies started aiming for compliance. - Boldly declaring that (often without passing through prior stages) the mission or purpose of the company is to contribute to society and be regenerative.

6.1 Survey Results

The results from the survey are displayed in figure 15. All respondents from the survey answered either that the current position of Dutch RE developers is 'compliance' or 'beyond compliance'. Because variables (or options) provided to the respondents of the survey are ordinal variables[7], the median can be used to find midpoint of the results (Field, 2018). The median of the survey results is 'compliance', which is part of the reactive phases of sustainability from Senge et al. (2010).

[7] Ordinal variables: categorical variables with a logical order (Field, 2018)

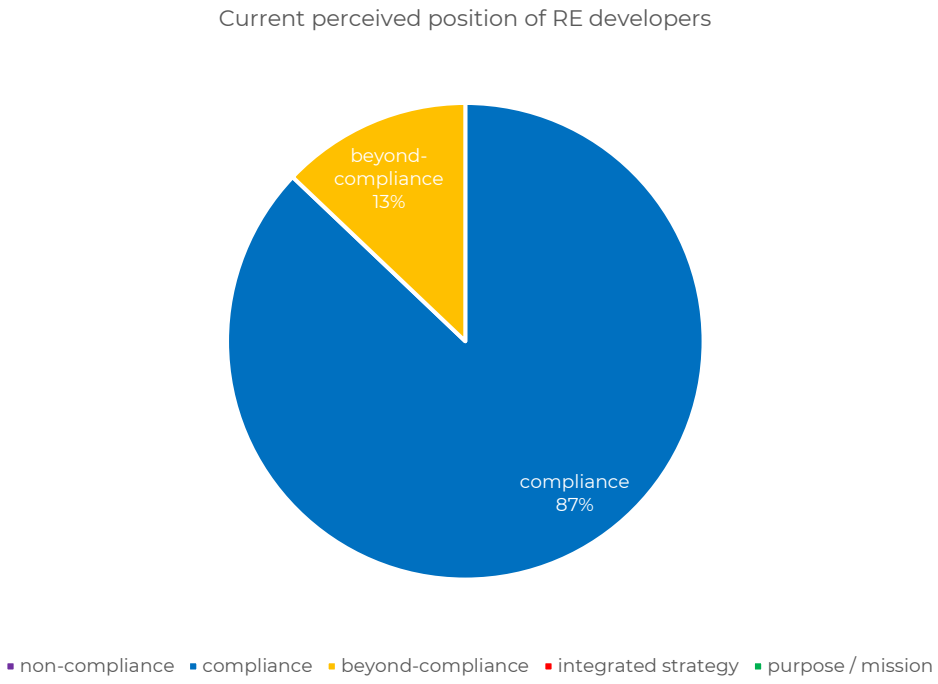

figure 15: current perceived sustainability compliance position of Dutch RE development market (own illustration)

These result confirm the findings mentioned in section 1. Dutch RE developers are often not translating the pressure and / or opportunities of sustainability to practice. According to the results of the survey, the average Dutch RE developer is reacting to external pressure instead of proactively implementing sustainability to contribute to a faster transition towards a more sustainable built environment.

6.2 Conclusion

This section of the survey answers sub-question 2: "*What is the current 'compliance' position of Dutch RE developers in relation to sustainability?"* The current compliance position of the market, based on these results, is 'compliance' in the reactive stages of sustainability compliance. According to Senge et al. (2010), the reactive phases involve reacting to external pressures. Because reacting to external pressures are usually a costly way to deal with sustainability, parties that find themselves in this position often assume that the moving to the proactive phases (beyond-compliance and further) will be costly as well. This argumentation is aligned with the traditionalist view towards sustainability, as described in section 4.1. Furthermore, it is also aligned with the results from the survey discussed in section 5.3, where financial barriers also seemed to have the largest impact on preventing Dutch RE developers to implement a sustainable corporate strategy. For Dutch RE developers to move to the proactive stages, certain steps need to be taken.

The steps that need to be taken can be (partly) derived from table 14. For Dutch RE developers to move the proactive stages of sustainability compliance, the cost effectiveness of sustainability for the RE development sector needs to be realized. For this to happen the savings and pay-offs need to far outweigh their initial investments. Moving to stage 4, integrated strategy, often occurs when companies discover that proactively implementing sustainability into their strategy creates a much broader set of business opportunities (Senge, Smith, Kruschwitz, Laur, & Schley, 2010). Van Driel & Van Zuijlen (2016), mention that in the RE sector this can for example be improving the sell- or rentability of properties. Because the result of the survey show that the perceived position of the market is reactive no SDA's will be excluded in the later stages of the interviews.

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Phase three: Variables & Impact analysis

KCI's, SDA's, and impact analysis using MCDA and semi-structured interviews

Image source: https://www.inc.com/dana-severson/24-must-have-tools-for-running-a-growing-company-today.html

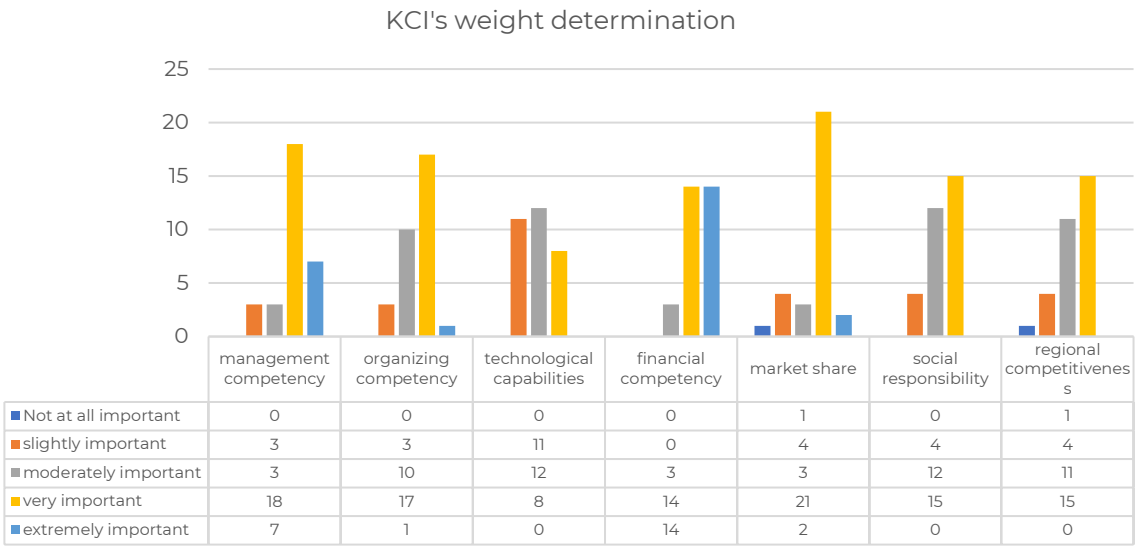
7 KCI's for Dutch RE Developers

One of two variables that need to be determined for the MCDA are the Key Competitiveness Indicators (KCI's) in combination with a weighted index to determine what components, and to which extent, contribute to the competitiveness of Dutch RE developers. This section answers the third sub-question of this research: "*What are the key competitiveness indicators (KCI's) that determine the competitiveness of Dutch RE developers?"* As mentioned in section 2.4.3, the KCI's of RE developers were determined using prior found literature which was later translated to a survey to determine to which extent these KCI's are of importance to Dutch RE developers.

Based on a literature review, see section 4.3.2, it was decided that the identified KCI's of Li (2011) would be used as a foundation for the survey. The respondents were provided with an overview of the identified KCI's along with a description. The respondents were asked to what extent the KCI is of importance to determining the competitiveness of Dutch RE developers. figure 7 showcases the overview of the KCI's that were provided to the respondents. By asking Dutch RE developers to rate the importance of the KCI's found by Li (2011), a weighted index can be added in the MCDA which allows to calculate a weighted summation. As indicated before, the weighted summation allows an accurate approach to determining competitiveness for firms (Zhang, Shen, Wu, & Fan, 2009).

7.1 Results from survey

figure 16 shows the results from the survey. By determining the average score of each of the categories a weighted index can be allocated to each of the KCI's. The weighted index is used to determine the final score of the impact of each of the SDA's on the KCI's. Because all the KCI's scored positively, no existing KCI's from Zhang et al. (2009) were excluded in the final corporate decision tool either.



	management competency	organizing competency	technological capabilities	financial competency	market share	social responsibility	regional competitiveness
Not at all important	0	0	0	0	1	0	1
slightly important	3	3	11	0	4	4	4
moderately important	3	10	12	3	3	12	11
very important	18	17	8	14	21	15	15
extremely important	7	1	0	14	2	0	0

figure 16: KCI weight index from survey (own illustration)

The average scores, which are adopted in the MCDA, are displayed in table 15:

table 15: average score KCI from survey (own table)

KCI	Management competency	Organizing Competency	Technological Capabilities	Financial competency	Market share	Social responsibility	Regional competitiveness
Average	3.94	3.52	2.90	4.35	3.61	3.35	3.29

8 Sustainable Development Activities (SDA's) for Dutch RE developers

The fourth sub-question of this research: *"which sustainable development activities (SDA's) can be implemented by Dutch RE developers"* was partially answered in section 4.4. During the literature review twenty actions were identified that can contribute to a more sustainable corporate strategy which were allocated to five independent SDA's. These SDA's are green product development, green supply chain management, green human resource management, green profiling and marketing strategy, and green facility management.

In the earlier phases of research, during the explorative interviews, it was also found that a great deal of sustainable actions / SDA's would be found from practice. Therefore, the semi-structured interviews were used as an opportunity to discover missing actions or SDA's and continue to develop the list of sustainable actions that can be implemented in practice. This is important, because as addressed by Buskens and Heurkens (2016), Dutch RE developers are insufficiently aware of what sustainability truly entails. By showcasing the different actions and SDA's that are available to Dutch RE developers, a better understanding of the different aspects of sustainability can be obtained. Furthermore, it provides insight towards sustainable measures to improve the sustainability within the corporate strategy which would otherwise not be considered.

8.1 Additional actions / SDA's from interviews

As mentioned before, the respondents of the semi-structured interviews, in the third phase of this research, were asked to provide additional actions / SDA's from practice. In section 4.4 the actions and SDA's that were found from literature were discussed. The complete list of actions and SDA's from both literature and the semi-structured interviews is displayed in table 16.

table 16: complete overview of SDA's and actions available to Dutch RE developers (own table)

Green Product Development	Green Supply Chain Management	Green Human Resource Management	Green Profiling and Marketing Strategy	Green Facility Management
Maximize score on BREEEAM	Work with sustainable parties in project team	Value- based recruitment (focus on sustainability)	Profile the company as 'sustainable'	Act in a sustainable manner within the company
Maximize score on LEED	Business – environmental group partnerships	Employee training in sustainability	Emphasize on sustainability in online marketing	Invest in sustainability in personal investments (ownership)
Maximize score on WELL	Work with innovative partners	Employee development in sustainability	Become a certified B corporation	Use smart data to improve real estate performance
Maximize score on Green rating	Exclude partners using selection criteria	Talent management	Knowledge sharing	Sustainable housing of offices
Integrate circularity into developments	Utilize sustainable investors	Performance management	Exemplary function in regard to sustainability	Encourage a sustainable culture within the firm
Develop flexible buildings	Maintain sustainable relationships	Incentive systems in accordance with the corporate sustainability strategy		
Minimize effect on transport		Employee health		
Utilize Global ESG Benchmark (GRESB)		Retain employees		
Develop to have livability / societal positive effect				
Develop using Biophilic Design				
Develop climate adaptive buildings				
Increase the life cycle of buildings / products				
Add vegetation to public space				

To some extent there is a overlap between different actions. For example, minimizing the impact on transport is also considered in BREEAM. As mentioned before, see section 4.4, some actions are considered as separate actions because during the interviews it was indicated that more emphasis need to lie on these aspects.

8.2 Conclusion

table 16 shows that the number of actions allocated to each of the different SDA's nearly doubled, however the SDA's remained the same. During the first interviews the list grew more rapidly than towards the end, this is logical due to the possible sustainable actions decreasing as more respondents analyzed the list. The current list was found to be comprehensive during the last few interviews. However, this list is likely to change when the same interviews would be held in the future, due to the growing interest in sustainability.

Another finding from this portion of the semi-structured interviews was an increase in sustainable actions regarding the social aspects of sustainability. Actions such as developing to have livability / societal positive effect, adding vegetation to public space, maintaining sustainable relationships, retaining employees, employee health, knowledge sharing, and encouraging a sustainable culture were all found during the semi-structured interviews. This shows that in practice the societal aspects of sustainability are growing as well. It is important to note that most of these actions were found during the interviews with RE developers who found themselves in phase three of four of the five sustainability stages of Senge et al. (2010).

As mentioned before, including each individual action from table 16 in the MCDA is too time consuming for the timeframe of this research. Therefore the SDA's are used in the MCDA to do the impact analysis. More information on this topic is provided in section 9.2.

9 Findings from interviews and Impact analysis of SDA's on KCI's

The semi-structured interviews were divided in two different sections. The first section of the interviews focused on what sustainable actions the respondents, working for Dutch RE developers, implemented in their corporate strategy and whether companies of the respondents were enhancing their competitiveness from doing so. The second section, the structured section of the interviews, focused on filling out the MCDA between the SDA's as alternatives and the KCI's as criteria, or in other words the impact analysis.

This chapter addresses both sections of the interviews from which conclusions are drawn. The impact analysis also addresses how the output, which is displayed in the MCDA, is determined.

9.1 Sustainable actions implemented by respondents and effect on their competitive advantage

During the first part of the interviews respondents were asked whether sustainability was part of the corporate strategy of the firm at which they are employed. Furthermore, they were also asked whether the implementation of those actions positively affected their competitiveness.

The sustainable actions implemented by the respondents of the interviews were extremely diverse. This is logical because, as mentioned in section 2.5.2, the respondents were sought in the 2nd, 3rd, and 4th phase of the five phases and emerging drivers of Senge et al. (2010). The range of implementing sustainability into a corporate strategy during the interviews went from not addressing sustainability whatsoever, to sustainability being one of the main domains for the corporate strategy. Below the answers provided by each of the respondents from the interviews are discussed based on the different stages and emerging drivers of Senge et al. (2010).

9.1.1 Respondents from 'compliance phase' (phase 2)

Respondents who find themselves in the 'compliance' phase of sustainability indicated that sustainability was not proactively included in their corporate strategy. They indicated that sustainable measures would only be implemented as means to achieve certain ends, or in other words, in a reactive manner to a client. For example, one of the interview respondents indicated that sustainable measures would be used as a stimulus towards municipalities to convince them of a certain plan or to be able to answer to the wishes of a potential tenant. The objective here is not to become more sustainable, but be able to start a project or a sign a certain tenant. This logic towards implementing sustainable measures was found more often for parties in the compliance phase. For example, increasing the lifespan of a building in early stages of the project to ensure low maintenance costs, is focused on low maintenance costs and not on increasing sustainability. This way of operating is considered reactive.

During the interviews with the parties in these phases it was indicated that a competitive enhancement caused by the sustainability measures was often not noticed unless it carried a direct project related positive output, such as increasing the life cycle. It is logical that parties who rarely implement SDA's are not able to notice a competitive gain from doing so. Furthermore, it was indicated that the competitive advantage did not necessarily lie with the RE developers, but with the users of the buildings (see split-incentive, section 4.2) or RE developers competing in a tender.

9.1.2 Respondents from 'beyond-compliance phase' (phase 3)

In general it was found that parties who find themselves in the beyond-compliance phase did implement sustainable measures and that sustainability was part of their corporate strategy, but not one of their main drivers. It was found that the respondents from this phase acknowledge the positive outputs of SDA's in a corporate strategy and seem to be transitioning from the traditionalist view to the revisionist view, as discussed in section 4.1.

Sustainability in the corporate strategy for the 'beyond-compliance' phase often translated to product related sustainable actions. The other aspects of sustainability, social- and financial aspects, were hardly mentioned by the respondents of the interviews. Furthermore, it was found that considering sustainability was often done on project level, and sometimes on a single product level such as solar panels, rather than embracing it into their

entire strategy. By focusing on sustainability on a project or product level the output of those sustainable measures were often sought within that same project.

Furthermore it was also mentioned that municipalities play a crucial role in sustainability. The high demands and prices set by municipalities often already pressurizes the business case of a project leaving less budget to implement sustainable solutions. The financial stimulus system for sustainable solutions seems te lacking and currently keeping Dutch RE developers from implementing more sustainable solutions.

The parties in the beyond-compliance phase found that sustainability in their corporate strategy did lead to a competitive advantage, but only in certain aspects. For example, it was mentioned that supplying sustainable solutions could lead to an increase in clients, due to the increase in demand for sustainable solutions, however the competitive advantage was often not related to end-users and consumers. The direct output towards sustainable solutions (project-based) still plays a large role for Dutch RE developers in this phase as well, yet a broader view towards the possible positive outputs of sustainability is being realized to a greater extent than in the previous phase.

9.1.3 Respondents from 'integrated strategy phase' (phase 4)

During the interviews with respondents from the fourth phase, integrated strategy, a shift in topics of the conversations could be recognized. Where the previous two phases focused mostly on product / project related sustainability, respondents from this phase focused on sustainability throughout the entire process. This was especially noticed in the approach or start of a project. Where in the previous phases sustainability was included in later phases of a project, respondents from this phase indicated that it was used to shape a project. Furthermore, the different aspects of sustainability, besides ecological, were also addressed more thoroughly. Where the previous two phases mostly focused on the ecological related aspects, in these interviews topics such as gender equality, developing with civilians, diversity, social safety, positive impact on society, sustainable financing, CO_2 footprint and more, were also addressed. This shows that parties in this phase work with a broader definition of sustainability then in the previous phases.

Parties from the 'integrated strategy' phase also acknowledged that a positive impact on their competitive advantage is present, moreover, respondents deliberately used sustainability for a competitive gain. The largest positive impact was recognized in collaborating with parties such as the municipality, users, and investors. The increase of the demand towards sustainable solutions from these parties allow a smoother collaboration. It was indicated that because these parties are important to the RE development process, this is considered as a substantial competitive advantage. Integrating sustainability into the approach towards a project positively impacted the collaboration and ease of starting a development in the Dutch RE development sector. The reason for this is that parties such as municipalities, investors and tenants also have their own sustainability ambitions. Supplying sustainable solutions therefore also benefits them because it allows them to meet their own ambitions with more ease. For example, a potential office tenant might have the ambition to lower their impact on the environment, therefore supplying a sustainable office could help them realize this goal effectively.

9.1.4 Conclusion

All in all, it can be stated that even though the implementation of sustainability was different between the respondents, a positive impact on their competitiveness is present. The positive impact was mostly found in the collaboration with other parties such as the municipality, potential clients, investors, and end-users. This collaboration is important due to the involvement of these parties throughout the entire process, from gaining a permit for a project to finding a tenant for a newly realized building.

One of the most notable differences between the respondents, from this part of the interview, was that level of implementation of sustainable actions. The conversation with parties in the earlier phases focused mainly on implementing sustainability in a project, whereas parties who found themselves in the fourth phase focused on exploiting sustainability to shape a project and continuing this mindset throughout the life cycle of the process. Senge et al. (2010), mention that parties who move to the fourth phase of sustainability compliance (integrated strategy) realize that there is a broader selection of business opportunities through sustainability. This same conclusion can be drawn for Dutch RE developers as well. The increase in competitiveness was mostly recognized in other aspects than in the direct output of a single project.

9.2 Impact analysis of SDA's on KCI's

To gain a better understanding where an enhancement of competitiveness can be noticed through implementing SDA's, an impact analysis of the SDA's on the KCI's was executed with each of the respondents. As previously explained, this impact analysis was done using a MCDA during the structured section of the semi-structured interviews. Below a short overview of the process of executing the impact analysis is provided, together with the average results of all the respondents. This section thereby answers the fifth sub-question of this research: *"to what extent do the SDA's taken by Dutch RE developers affect their KCI's in the real estate market?"*

9.2.1 Starting point of MCDA

The empty MCDA is displayed in figure 17. In the left-hand column all the SDA's are given as alternatives (grey). Prior to filling out the MCDA each of the SDA's and the individual actions was discussed with the respondents to ensure the understanding of what each of the SDA's entails. Furthermore, each of the KCI's were explained to the respondents using a comprehensive definition and examples provided by Li (2011).

What is the impact of the SDA's on the KCI's?		KCI's							
		Management compentency	Organisation competency	Technological capabilities	Financial competency	Market share	Social responsibility	Regional Competitiveness	
SDA's	Green product development								0,00
	Green Supply Chain Management								0,00
	Green Human Resource Management								0,00
	Green profiling and marketing strategy								0,00
	Green facility management (intern / extern)								0,00
		0,00	0,00	0,00	0,00	0,00	0,00	0,00	

figure 17: empty MCDA used in interviews (own illustration)

9.2.2 Filling out the MCDA

The respondents of the interviews were asked to what extent each of the SDA's impacted each of the KCI's. This was done on a Likert scale from 1-5 (see section 2.4.5). Also, the option of 'no relation' between a SDA and a KCI was also provided. This allowed respondents to indicate when a SDA would not influence a KCI. During the interviews each of the KCI's was explained to ensure a comprehensive understanding of the desired output of the MCDA.

What is the impact of the SDA's on the KCI's?		Key competitiveness indicators (KCI's)							
		management competency	organizing competency	technological capabilities	financial competency	market share	social responsibility	regional competitiveness	
sustainabledevelopment activities (SDA's)	Green product development	4	4	5	4	5	3	5	30
	Green Supply Chain Management	3	4	4	4		1		16
	Green Human Resource Management	3	5	4	2	2	4	2	22
	Green profiling and marketing strategy	3	4	3	5	4	1	4	24
	Green facility management	2	3	3	1	1	3	1	14
		15	20	19	16	12	12	12	

figure 18: example of filled out MCDA (own illustration)

In figure 18, an example is provided of one of the respondents from the interview. The darker colors indicate a heavier positive influence of the SDA on the KCI. For example, in this case, the respondent indicated that the SDA of green product development had a very high positive influence on the KCI 'market share'. In other words the individual actions that form the SDA 'green product development' will increase the performance on the key competitiveness indicator 'market share'.

9.2.3 Output of MCDA of all interviews

The average output of all the interviews is summarized in figure 19. The displayed impact of the SDA's on each of the KCI's is the average of all the responses corrected by the weighted index of the KCI's, obtained from the survey, translated to scale from 1-5. Rewriting the impact on a scale of 1-5 makes it more relatable to the answers provided during the interviews. The impact of each of the SDA's on the KCI's was calculated using the following formula:

$$X_{weighted\ average} = \frac{\bar{x}_{impact} * y}{5}$$

In this formula X represents the weighted average, or in other words, the value which can be read in each of the cell in figure 19. $\bar{X}$ represents the average impact of each of the findings (of a scale of 1-5) during the interviews and y represents the weighted index (on a scale of 1-5) which can be read from grey row in figure 19 and determined through the survey (see section 7). The formula is then divided by 5 to translate the findings to a scale from 1-5.

On the right side of the table a summation of the impact on all the KCI's can be found. The highest score here indicates which SDA has the highest contribution to the competitiveness of Dutch RE developers and therefore is most likely to deliver a competitive advantage. On the bottom of the table the summation of the impact on each KCI can be found. These values indicate what KCI can be influenced most by implementing the SDA's. These values can be interesting to a Dutch RE developers who want to gain an understanding of what can be achieved through implementing SDA's.

What is the impact of the SDA's on the KCI's?		KCI's							
		Management compentency	Organisation competency	Technological capabilities	Financial competency	Market share	Social responsibility	Regional Competitiveness	
SDA's	Green product development	2,66	2,46	2,10	3,48	2,98	2,52	2,80	**19,00**
	Green Supply Chain Management	2,56	2,20	2,10	3,05	2,27	2,26	2,07	**16,51**
	Green Human Resource Management	2,75	2,73	1,67	2,40	2,17	2,43	1,89	**16,04**
	Green profiling and marketing strategy	2,85	2,29	1,45	3,27	2,71	2,18	2,47	**17,21**
	Green facility management	2,56	2,29	1,74	2,50	1,90	2,26	1,56	**14,81**
		13,38	**11,95**	**9,07**	**14,70**	**12,03**	**11,66**	**10,79**	

figure 19: average of all MCDA's from interviews (own illustration)

9.3 Compelling findings from interviews

During the interviews several compelling findings or trends were found. Due to these findings, the focus group was used to gain a better understanding of these topics. It is important to note that the desired number of focus group respondents was not achieved, therefore the reliability of these insights are limited (see explanation in section 10). The first trend that was discovered, was that respondents from the 'compliance' and 'beyond compliance' phases often sought for a pay-off of sustainable actions on a project level, whereas respondents from the 'integrated strategy' phase indicated that the pay-off is noticed throughout the firm through, for example, a better relationship with municipalities or the opportunity to start another project. Second, the average of the interviews show that the largest impact on the competitiveness of a Dutch real estate developers can be achieved on the financial competency, yet phase two of this research indicated that the financial barriers form the largest obstruction to become more sustainable. Third, it was found that even though Dutch real estate developers sometimes find themselves in the lower phases regarding sustainability, all respondents indicated that a competitive advantage can be gained from sustainability. This raises the question, if they acknowledge that a competitive advantage can be won through sustainability, why aren't they taking that opportunity? The three compelling findings / trends were presented to the focus group as questions displayed in table 17. Below the findings from the discussion during the focus group are presented.

table 17: compelling findings from interviews for discussion in focus group (own table)

#	statement
1	Dutch real estate developers who have not fully integrated sustainability into their corporate strategy were found to look for a payout of a sustainability measure on a project level. However, Dutch real estate developers who do integrate sustainability into their firm indicate that a payoff is not noticed on a project level, but in other aspects such as relationships with municipalities, investors, and/or potential tenants. Why are payoffs then considered on a project level?
2	Financial barriers were found to form the largest obstruction for Dutch real estate developers to become more sustainable, yet the interview results indicate that the financial competency (composed of financing capabilities and capital growth) has the highest contribution towards competitiveness when implementing sustainable development activities. How can this be explained?
3	All respondents from the interviews acknowledge that a competitive advantage should be gained from obtaining a more sustainable corporate strategy, yet not all Dutch real estate developers proactively implement sustainability, why are they not taking that opportunity?

9.3.1 Payoff in projects vs. payoffs throughout company

The largest contributing factor to this finding from research is supply and demand. Participants from the focus group indicated that parties who operate in the later phases of sustainability compliance are also being asked to supply highly sustainable solutions. This allows those parties to implement sustainability in their corporate strategy more extensively than parties who have clients who do not set these demands. When the demands are not set by the client the implementation of sustainable solutions becomes difficult because in general the cost for sustainable solutions are higher than projects that do not take this into account. Therefore the budget for implementing sustainable solutions from the client points of view is less likely to meet the amount required for implementing sustainable solutions to such a great extent. This doesn't allow real estate developers from the 'compliance' and 'beyond-compliance' phases to experience the same amount of positive effect as the real estate developers who find themselves in the 'integrated strategy' phase. Therefore the considerations of sustainable solutions are more likely to be done on a project level.

9.3.2 Financial barriers and financial competence gain

It was found that even though the largest competitive gain can be realized in the financial competence of a firm, achieving that competitive advantage is still hard to achieve. The respondents of the focus group indicated that the trend of sustainability is now being reflected in the law and regulation and demands of a client. This is causing the minimal requirements regarding sustainability to increase. Because the requirements of the client and law and regulation are set high, it becomes more difficult to implement sustainability because the possibilities to outperform the requirements (to go beyond-compliance) become smaller. This makes it difficult to proactively implement sustainability into a corporate strategy.

Furthermore it was also indicated that the real estate development market is not transparent in showcasing the financial impact of certain measures in projects. Without sharing the knowledge, parties do not have the insight that parties from the higher phases of sustainability compliance have. On the contrary showcasing the financial impact of sustainable measures might lead to more parties implementing the same

sustainable measures thereby making it harder for real estate developers to positively differentiate themselves from others.

9.3.3 Competitive gain acknowledgement yet lack of implementation

This finding was explained by the focus group due to two different reasons. First, as mentioned before, it is difficult to parties to differentiate themselves from others in terms of sustainability because the requirements set by clients and law and regulation are already relatively high. Even though parties acknowledge that a competitive gain can be achieved through sustainability it does not directly mean that it is easy to achieve. Second, as found in the earlier stages of research, real estate developers seem to be insufficiently aware of what can be done regarding sustainability. By not being aware of what sustainable solutions can be implemented the real estate developers are limited in options to become more sustainable.

9.4 Conclusion

The overall results of the MCDA show some interesting results. First, in general respondents thought that the implementation of sustainability in general contributes to the competitiveness of a firm. Thereby confirming the assumption of a positive relationship between sustainability and competitiveness as addressed in section 4.1. As can be seen in *appendix c – interview results*, on some occasions it was indicated that there was no relationship between a certain SDA and KCI, however, because in almost all occasions it was believed that there was a form of direct or indirect impact of a SDA on a KCI, these measurements were not considered. Second, the individual results of the respondents differed, as can be seen in *appendix c – interview results*, however the order of the SDA's remained similar. The reasoning behind this can be explained by the argument of Zhang et al. (2009), presented in section 4.3. They mention that each of the firms is structured differently and focused individually, thereby making it difficult to compare one developer to another. A measured impact from one sector of RE development, i.e. retail, might not yield the same impact in another sector of RE development, i.e. dwellings. To showcase these results per sector, further research is needed.

When analyzing the summation of the results in figure 19 an order of which SDA is most likely to enhance the competitiveness can be determined. figure 20 below summarizes these results.

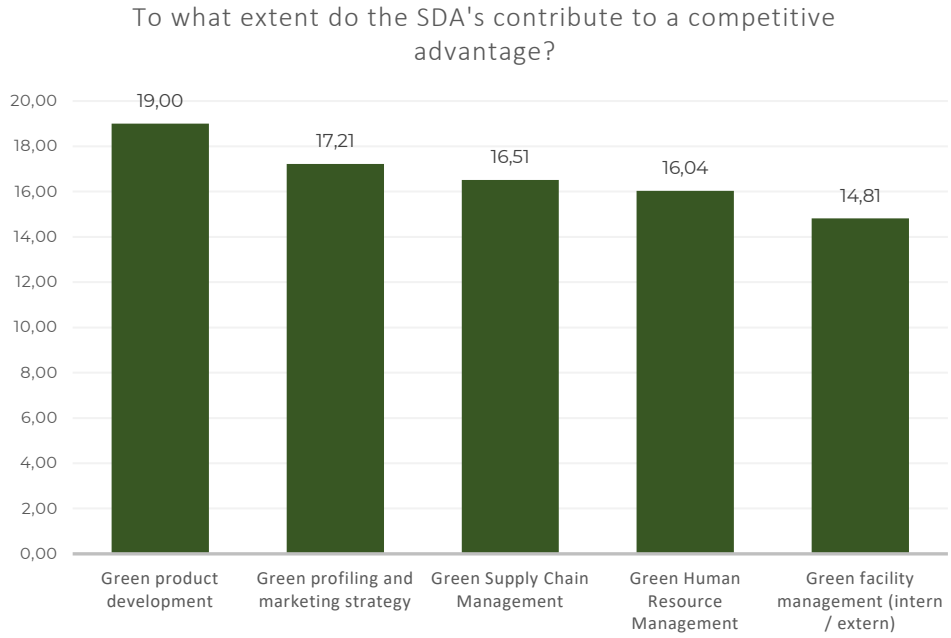


figure 20: to what extent SDA's contribute towards a competitive advantage (own illustration)

From the graph it can be seen that the SDA 'green product development' has the highest positive relation on the competitiveness of a Dutch RE developer and therefore has biggest chance to contribute towards gaining a competitive advantage. In nearly all the interviews, see appendix c – interview results, this was the case. Respondents indicated, because real estate development is the core of the Dutch RE developers, that it is logical

that producing sustainable products or buildings has the largest contribution. 'Green profiling and market strategy' was found to have the second largest impact of the sustainable development activities on the competitiveness of Dutch RE developers. The respondents of the interviews indicated that communicating the sustainable solutions, both through online marketing and personal communication, is key to having stakeholders be aware that you have the capacity to develop sustainable solutions. As previously indicated, the demand towards sustainable solutions is growing, therefore communicating that you can answer to this demand can help you gain a competitive advantage because potential clients and or users will look for parties to meet their sustainable strategies as well. After green profiling and marketing strategy, green supply chain management (GSCM) was found to have the third most positive relation regarding the competitiveness of Dutch RE developers. During the interviews it became clear that RE developers, in most situations, work together with other stakeholders to realize a project. The designers, contractors, advisors, and other stakeholder thus have a large stake in realizing the final output. The competitive gain is thus not only realized by the RE developers themselves, but also by the partnerships utilized to execute the projects throughout all its' phases. Green human resource management was found to have the second to last highest impact towards the competitiveness of Dutch RE developers. From the interviews it became clear that the KCI's that together form the competitiveness of a firm are more often influenced by the project teams than by the employees of the firm itself. The SDA that scored the lowest on positive impact towards the competitiveness of a firm was green facility management. The reason why this SDA scored the lowest could be because most of the respondents from the interviews were RE developers who did not keep real estate to generate a form a cashflow. Put differently, the form of green facility management that was utilized most by the respondents of the interviews, was internal. In this form, green facility management is characterized by operating with a sustainable mindset throughout during daily operations, such as renting or buying a sustainable office building. To examine whether green facility management could have a larger positive impact on the competitiveness of a firm, a distinction between different Dutch RE developers needs to be made, for this, more research is required.

Another method to analyze the results is by looking at the summation of each individual impacts per KCI. This summation is shown on the bottom of the MCDA in figure 19 and summarized in figure 21.

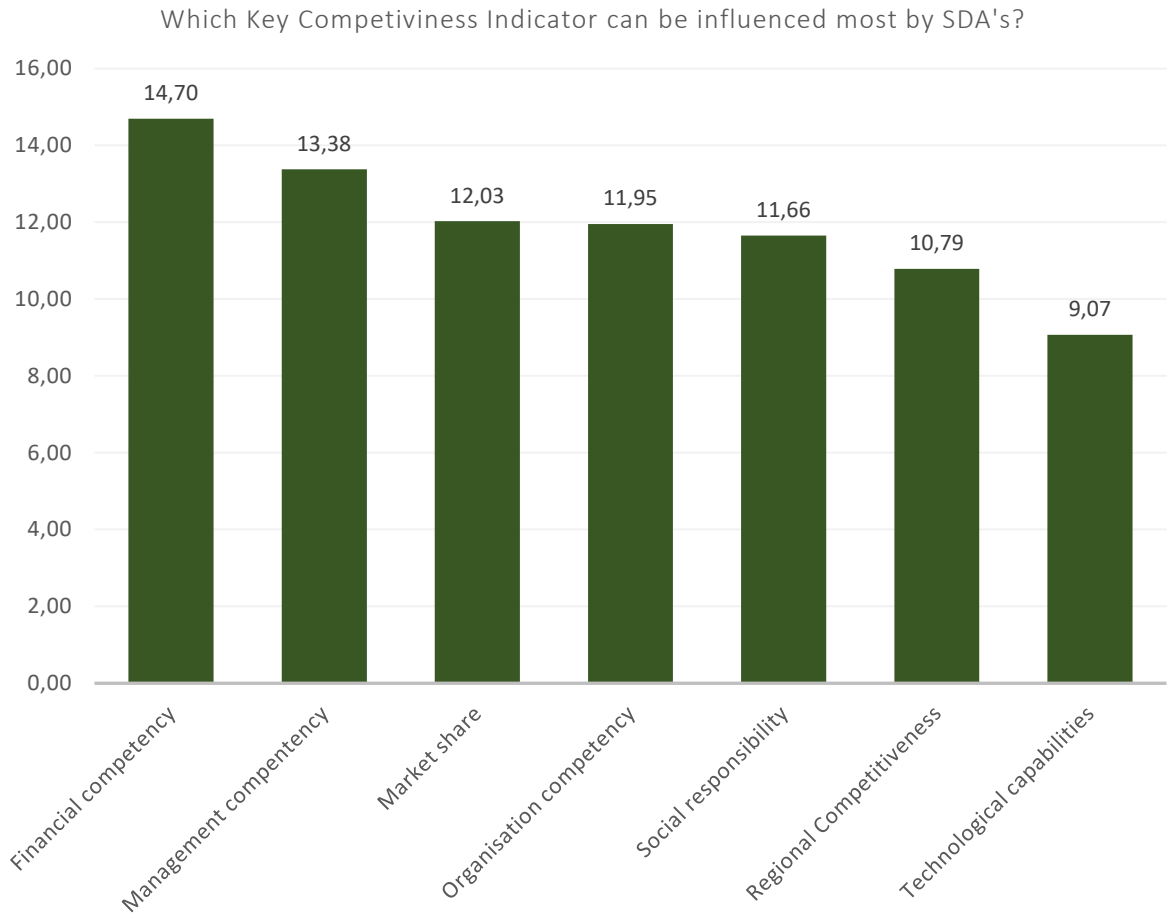


figure 21: which KCI can be influenced most by SDA's? (own illustration)

figure 21, shows the order in which the KCI scored when taking all the impacts (with their weighted index) between each of the SDA's and KCI's into account. It is important to note that these results do not indicate which KCI can be influenced most through sustainability but indicate what KCI has the highest contribution to competitiveness through sustainability. Financial competency, which is characterized by financing capabilities and capital growth (Li, 2011), scored the highest. This indicates that the financial competency has the highest contribution towards the competitiveness of a RE developer when obtaining a more sustainable corporate strategy. This is remarkable due to earlier findings in phase two this research. In phase two, the respondents of the survey indicated that financial barriers had the largest contribution towards keeping RE developers form implementing a more sustainable corporate strategy. While financing capabilities and capital growth focus on a company level, a larger part of the barriers focus on the project level. This is in line with the findings discussed in section 9.1, that a competitive advantage because of a sustainable corporate strategy is often not found on a project level but in different areas such as better relationships with financers and clients.

The MCDA displayed in figure 19 is used as a basis for the corporate decision tool which is designed in the next phase of this research. The design is executed through visualization techniques found in literature; a more in-depth description is provided in section 10.

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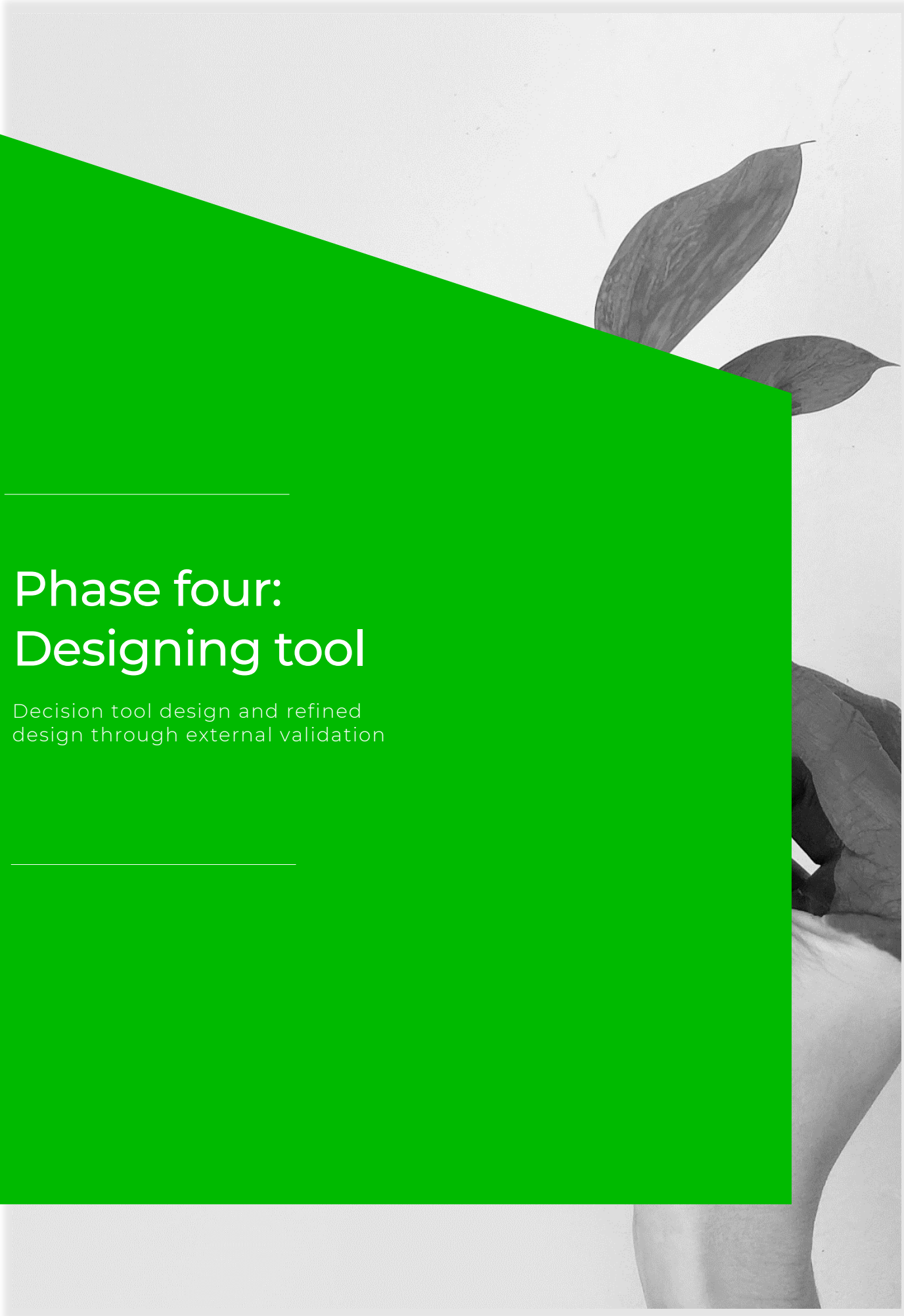

Phase four: Designing tool

Decision tool design and refined design through external validation

10 Corporate decision tool design

This last phase of the research is dedicated to providing a first insight towards how the relationship between the variables of the previous phases can be visualized. This phase provides the first impressions and components necessary to design a corporate decision tool considering the relations found between the alternatives and the key competitiveness indicators. In other words the first impressions and the components necessary to design a clear, applicable visualization of the corporate decision are provided. This is done to answer the last sub-question of this research: *"How should a corporate decision tool be designed to allow RE developers to effectively prioritize between SDA's to improve their competitiveness?"*

To be able to answer this sub-question the chapter is divided into sections in accordance with the process of research. First a literature analysis is provided on how the findings of a MCDA can be successfully visualized. This is an important step to understand how the cognitive burden of a Dutch RE developers might be kept to a minimum when analyzing the results of the MCDA provided in the previous phase. Thereafter the visualization of each found method is executed. These visualization were presented to a focus group in order to find which visualization was most successful to let Dutch RE developer prioritize between different SDA's based on the impact on competitiveness. The output of this chapter is a preliminary design of one of the visualization techniques that acts as a stepping stone for further research.

10.1 Importance of visualizing the results

As mentioned by Gettinger et al. (2011), discrete multi-criteria-decision-analysis problems with numerous outputs can cause a significant cognitive burden on the decision maker at hand. This problem is also present for the Dutch real estate development industry. As showcased in the previous phase all SDA's are likely to result in an enhancement of the competitiveness, however, exactly where this enhancement of the competitiveness can be realized is more complex to understand. Because firms are individually structured (Zhang, Shen, Wu, & Fan, 2009) it is important to understand on what KCI this positive output can be recognized, as it might result in a decision maker to choose a different alternative. A good representation of the data or visualization of the MCDA can help to alleviate this problem, thus, it is important to begin to understand how the results of this research can be translated to a corporate decision tool.

10.2 Possible visualizations of MCDA from literature

To comprehend how the data found from the interviews can be translated to a corporate decision tool, it needs to be understood how a successful representation of the data can be achieved. This section analyses three different methods of visualizing the data and will provide several alternatives of the decision tool which are discussed in the focus group. The results of this discussion are addressed later in this chapter. The aim of each of these different visualization techniques is provide the first understandings of what building blocks are necessary to design a successful decision tool.

10.2.1 Geometrical Analysis for Interactive Assistance (GAIA)

As mentioned earlier in section 4.5.3, one of the possible methods of displaying the results of the MCDA in a visual manner is through a Geometrical Analysis for Interactive Assistance (GAIA) chart. The GAIA chart can be used to display conflicts/convergence between criteria and strengths/weaknesses of certain solutions. Moreover, the quality of each of the separate solutions can be analyzed visually with respect to the different criteria (Dulmin & Mininno, 2003). An example of a GAIA chart is provided in the figure below:

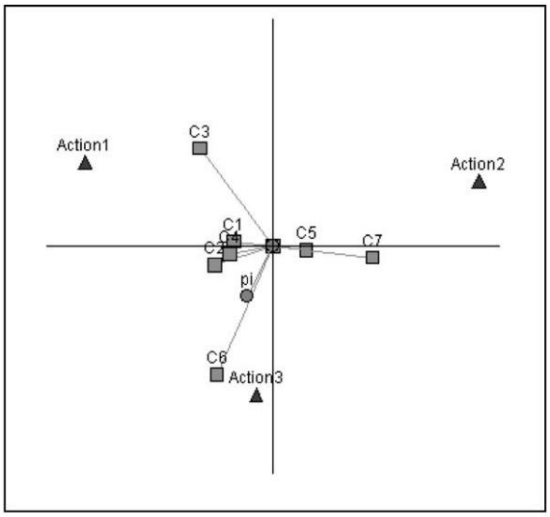

figure 22: example of a GAIA chart (Dulmin & Mininno, 2003)

In their research Dulmin & Mininno (2003), apply this method to visualize their data by displaying each of the different alternatives using points and the different criteria using vectors (i.e. C3). This shows the conflicts between different criteria, as well as the strength of each solution. This method is ideal when finding a solution to a single problem such as supplier selection. Dulmin & Mininno (2003), obtain the GAIA chart using the Preference Ranking Organization Method for Enrichment of Evaluations (PROMETHEE II).

However in this research this method does not fit the scope the research. Therefore only the visual representation of the results are adopted. As mentioned earlier, RE developers are individually structured firms and focused individually (Zhang, Shen, Wu, & Fan, 2009), and one Dutch RE developer finds themselves in a different phase of sustainability than another. Therefore a total visualization of the criteria per SDA needs to be displayed in the GAIA chart, whereas figure 22 only displays the average sensitivity of each of the criteria between the different actions.

10.2.2 Heat-mapping

Heat-mapping, the second method to visualize the data, is an alteration on traditional tables and is found to be effective in solving problems with numerous alternatives. It provides the same data of a table, as displayed in figure 19, but provides more insight. Heat mapping is done by coloring tables according to their values (Gettinger, Kiesling, Stummer, & Vetschera, 2011).

Gettinger et al. (2011), provide an example of how heat mapping can be executed, which is displayed in figure 23. In this example the alternatives are displayed as rows and the criteria are displayed as columns, like is done in the MCDA shown earlier in this research. A red color indicates a poor criteria performance, the closer the color becomes towards green the higher the measured performance of an alternative on that criterion.

figure 23: heat mapping example (Gettinger, Kiesling, Stummer, & Vetschera, 2011)

Heat-mapping minimizes the cognitive burden of a decision maker by allowing them to quickly analyze what aspects of the results to focus on. Using a recognizable color coding system, interpreting the results for the decision maker can become more intuitive thereby minimizing the cognitive burden on the decision maker and quickly allows to focus on the important results that are displayed.

10.2.3 Parallel coordinate plots

Parallel coordinate plots can also be considered as a method to visualize the data. Parallel coordinate plots display the found data without drastically increasing the complexity of the display or the cognitive burden on of the decision makers. This form of visualizing the data provides a good overview of the distribution of values (Gettinger, Kiesling, Stummer, & Vetschera, 2011).

Gettinger et al. (2011), explain that a parallel coordinate plot is designed through displaying the criteria values on a separate axis laid out in parallel. These values found per criteria by one alternative are connected

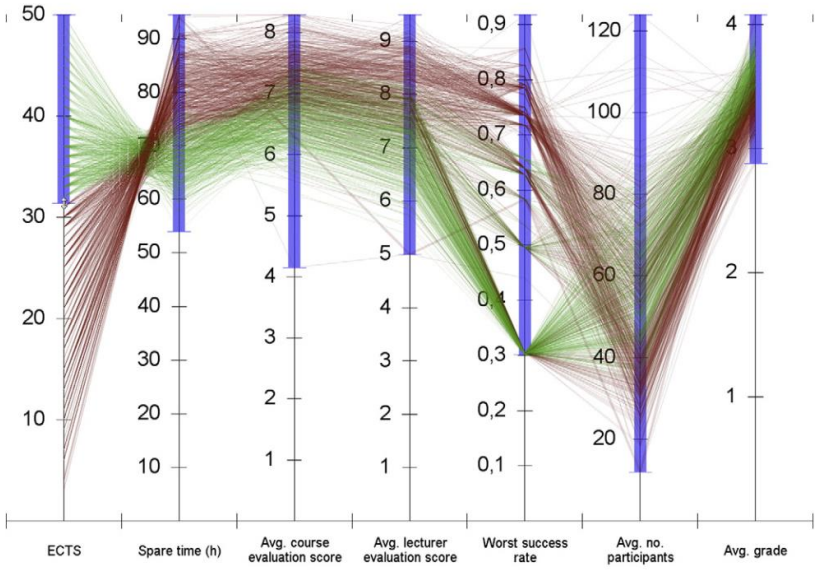

figure 24: Parallel coordinate plot example of each individual result (Gettinger, Kiesling, Stummer, & Vetschera, 2011)

using a line which allows to easily compare one alternative to another. This visualization can be done for each individual result (each interview) or an average of all the results as shown in figure 19.

figure 24 displays a parallel coordinate plot that showcases each of the individual results of a study used in the research of Gettinger et al. (2011) for two alternatives. Because this study focuses on 5 different alternatives, the SDA's, this form results in a difficult to read graph explained more in-depth in the next section.

10.3 Translating MCDA using visualization techniques

In order to showcase how each of the visualization techniques can be applied to this research. A translation is made for each of the methods based on the results of figure 19. These are the visual representations that were utilized during the execution of the focus group

10.3.1 Geometrical Analysis for Interactive Assistance (GAIA)

The translation of the MCDA to a GAIA chart is displayed in figure 25. As mentioned before the sensitivity analysis as performed by Dulmin & Mininno (2003) is not performed, however the visual representation principles are used. In the Gaia chart the impact of each SDA on each KCI is displayed (indicated by the colored vectors)[8]. The

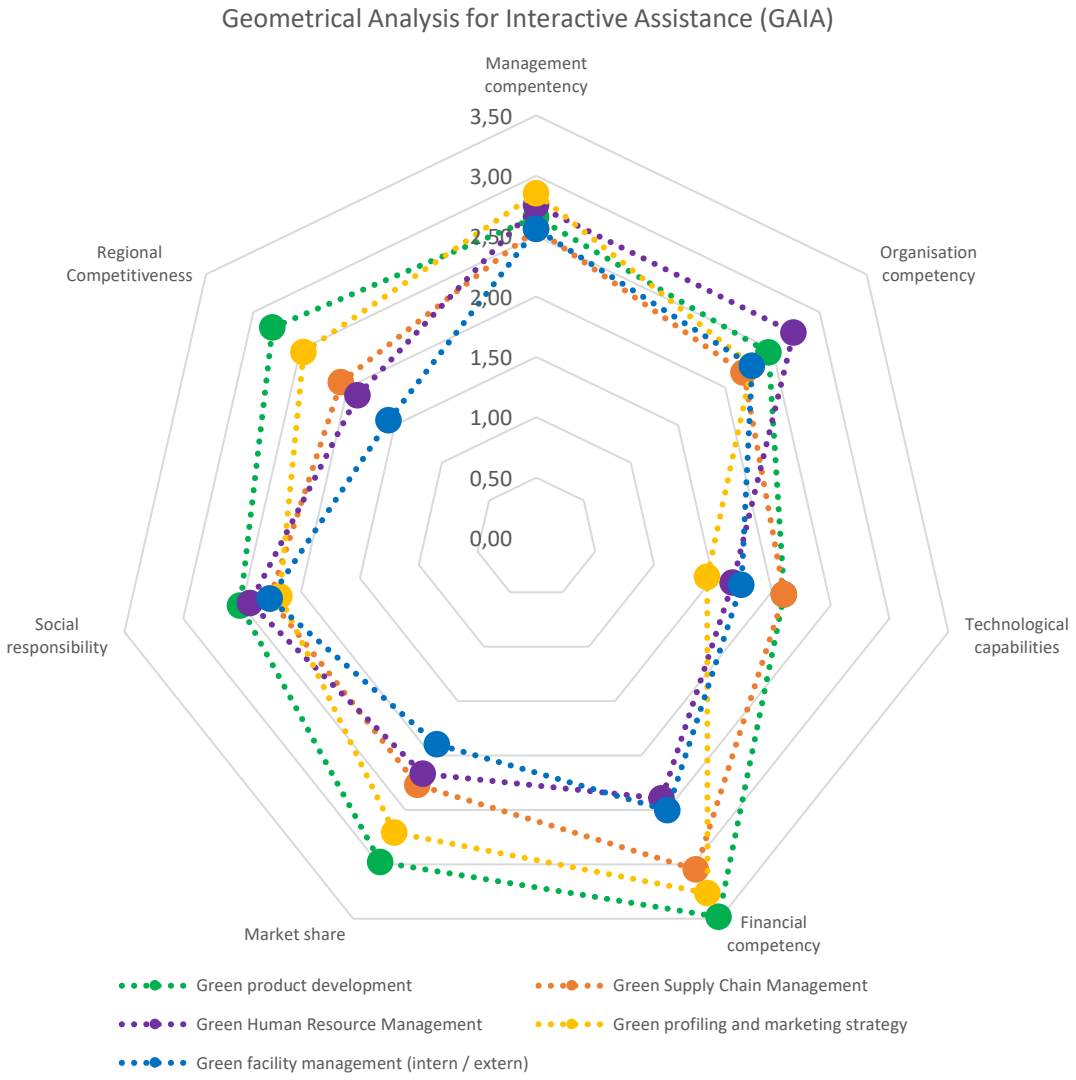

figure 25: GAIA chart for impact of SDA's on competitiveness of Dutch RE developers (own illustration)

[8] The scale of chart in reality extends to a score 5,0. To show the discrepancy between the results more vividly, the axis has max score of 3,5. The highest impact score, including weighted index, was measured at 3,48 between green product development and financial competency.

impact which is displayed include the weighed index of each of the KCI's and therefore displays the contribution of each of the SDA's towards the competitiveness of a firm.

10.3.2 Heat-Mapping

The heat-mapping method, as explained in section 10.2.2, is applied to the results of the MCDA displayed in figure 19 with some alterations and is shown in figure 26 (next page). A darker color green indicates a heavier positive influence of a SDA on a weighted KCI. Different colors were not considered because negative performance was not measured during the interviews. In other words, each of the KCI's is positively influenced by the SDA's to a certain extent. Therefore the use of more than one color was not chosen because it could lead to false conclusions.

It is important to note that some alterations were made to figure 19 to provide the overview of figure 26. First, the displayed order of the SDA's and the KCI's was changed to show the largest impacts in the top left of the table and the lowest impacts on the bottom right of the table. This structures the data from highest to lowest impact. By doing so, users of the tool can analyze the data provided in the table more efficiently. Second, a summation of the weighted impact of each of the SDA's on the KCI's is provided on the left-hand side of the tool. This allows the user of the tool to quickly understand what SDA has the highest positive impact on the competitiveness of a Dutch RE developer, thereby lowering the cognitive burden. Third, the summation of the total impact of all the SDA's on an individual weighted KCI is also provided. This aspect does not directly contribute to answering the main research question of this research: *"What is the impact of sustainable development activities that go beyond-compliance on the competitiveness of private Dutch real estate developers?"* However, it does provide insight on what KCI can be influenced most by implementing SDA's. For example, based on the results of the interviews, it can be stated that when a Dutch RE developer implements a more sustainable corporate strategy the likelihood that their financial competency will be more influenced than their technological capabilities, in terms of competitiveness.

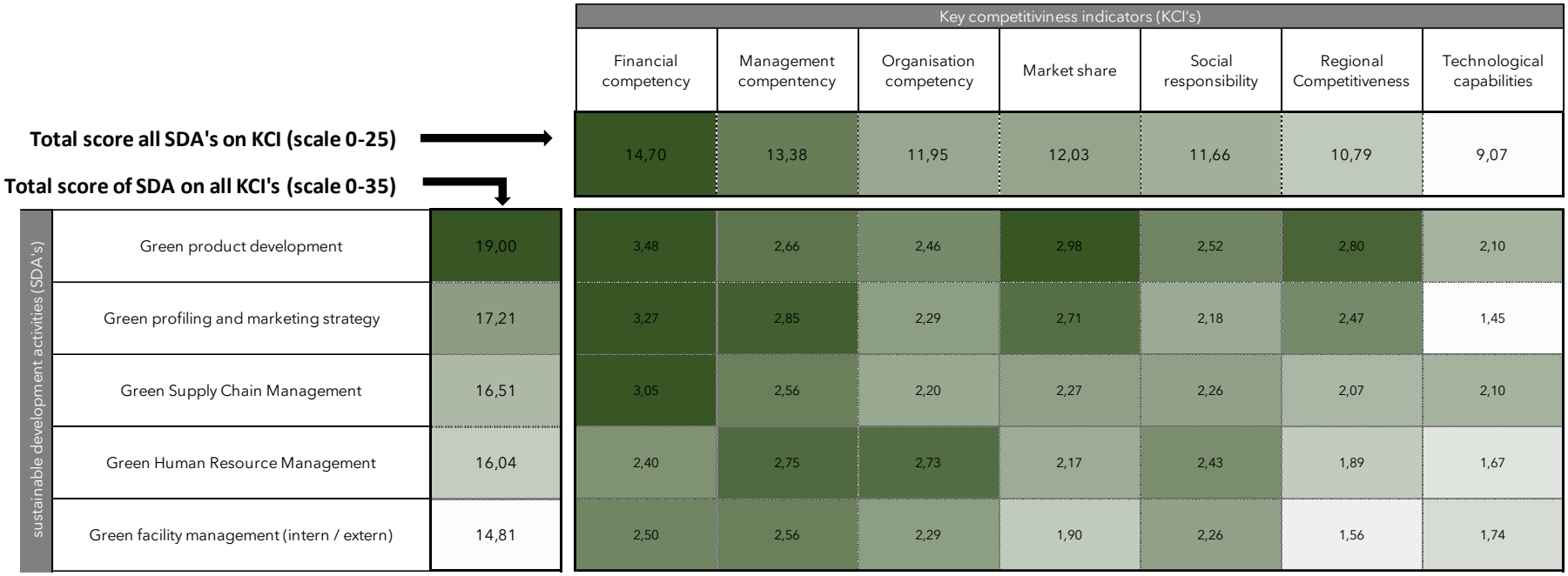

figure 26: MCDA visualization using heat mapping (own illustration)

10.3.3 Parallel Coordinate Plots

For the last visualization technique, the parallel coordinate plots, some considerations were made as well. The example of Gettinger et al. (2011), displayed in figure 24, shows how parallel coordinate plots can be used to show each of the individual results of a study. However, because this study involves 5 different alternatives with 7 respondents the visualization technique of the parallel coordinate plots would not minimize the cognitive burden, thereby working against the objective of this phase. The translation of the averaged results (displayed in figure 19) are shown in figure 27.

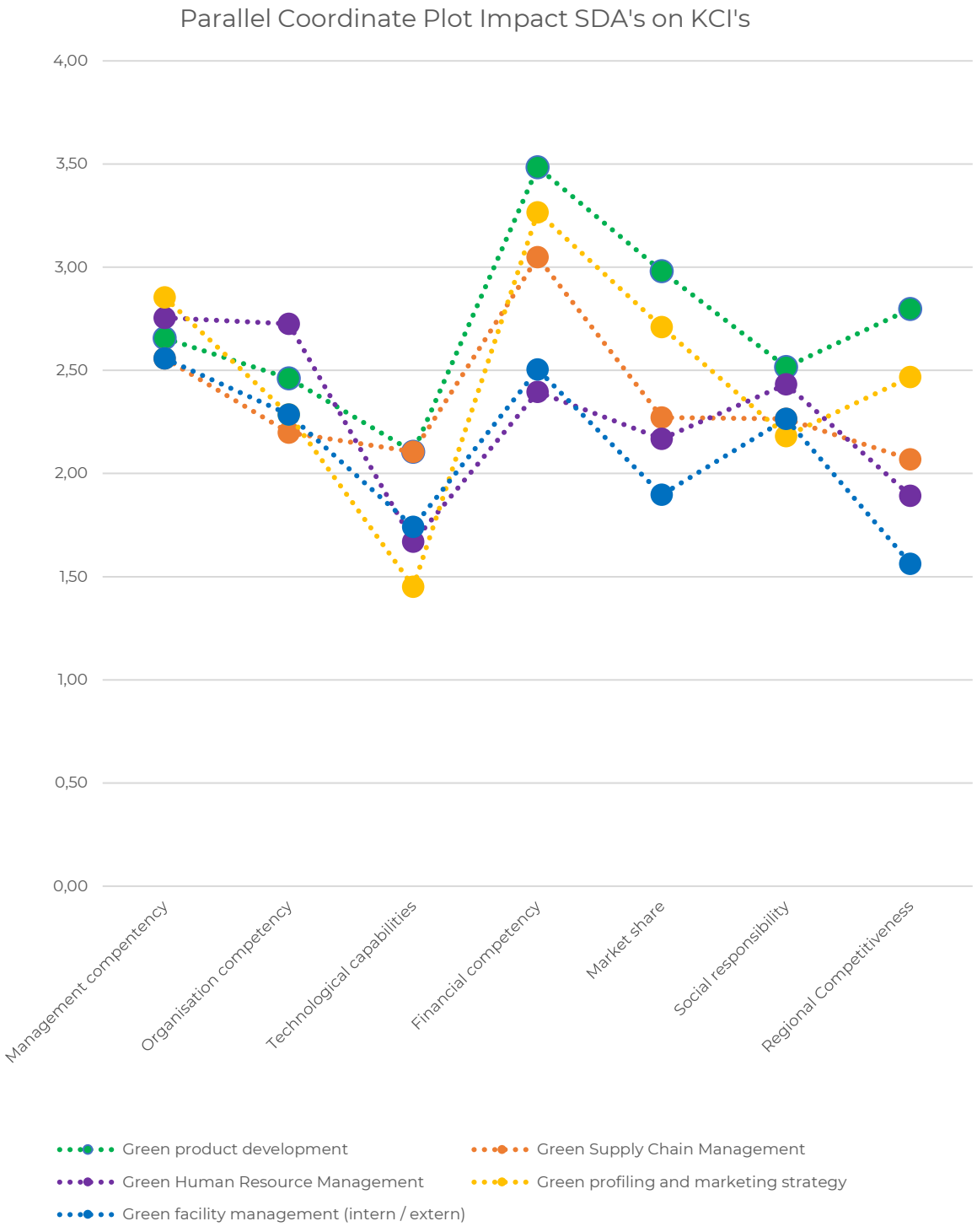

figure 27: Parallel coordinate plot visualization impact SDA's on KCI's (own illustration)

10.4 Focus group results

To gain a first impression of which visualization technique minimizes the cognitive burden of a decision maker, the visualizations in from the previous section were presented to a focus group. Unfortunately due to COVID-19 the focus group was eventually held with only two respondents. Therefore the results of this phase of research act as a stepping for further research and provide only a first impression of what visualization technique can successfully translate the findings of earlier research to a corporate decision tool.

During the focus group each of the individual visualizations were presented separately and the respondents were asked to indicate the positive and negative aspects of each of the visualizations. Through doing so a first impression can be gained of what aspects are important to translate the results from the MCDA displayed in figure 19 to a corporate decision tool.

10.4.1 positive and negative aspects of each visualization

In table 18, table 19, and table 20 the positive and negative aspects of the different visualizations based on the focus group are displayed.

table 18: positive and negative aspects of GAIA chart (own table)

Positive and negative aspect of GAIA chart	
Positive	Negative
Relatable	Hard to read, a explanation is needed to understand the results
	Does not provide an order of results
	Does not allow decision maker to focus on most important aspects
	Intention of the graph is unclear

table 19: positive and negative aspects of heatmapping (own table)

Positive and negative aspect of heat mapping	
Positive	Negative
Displays total scores	The use of three different scales
Color intensity allows to quickly focus on important aspects	Attention is drawn to colors not to the what the colors represent
Ordering of the impacts allows to structure the findings	

table 20: positive and negative aspect of parallel coordinate plots (own table)

Positive and negative aspect of parallel coordinate plots	
Positive	Negative
The scores can be easily interpreted	Does not provide an order of results
	Does not allow decision maker to focus on most important aspects
	Difficult to understand without further explanation

During the focus group it quickly became clear that heat-mapping allows the most intuitive representation of the results and thereby minimizing the cognitive burden of the decision maker. The other two visualizations took considerable time to understand prior to being able to be discussed, whereas heat-mapping was understood with relative ease.

The time to understand a visualization was found to be an important aspect during the focus group. It was mostly found that the GAIA-chart and parallel coordinate plots were too abstract and did not allow a decision maker to focus on what aspects are of importance. In other words these visualizations were found to be a complex representation of an already complex subject due to the amount of criteria and alternatives involved.

10.5 Conclusion and alterations to visualization

This phase showed that there are mainly two aspects that are of importance when designing a corporate decision tool to translate the results found in figure 19. The first aspect is minimizing the cognitive burden. This aspect was found in literature and confirmed during the focus group. Minimizing the cognitive burden of a decision maker allows them to understand a subject with relative ease which would otherwise take relatively more time to comprehend, thereby allowing a decision maker prioritize between alternatives more effectively.

The second aspect that was found to be of importance when designing a corporate decision tool is allowing the decision maker to focus on the important aspects of the results.

During the focus group it was clear that heatmapping caused the least amount of cognitive burden and most efficiently allowed a decision maker to focus on the important aspects. In the presentation of the different visualizations, respondents of the focus group needed significantly more time to understand the translation of the results with the GAIA chart and the parallel coordinate plot, whereas with the heat-mapping method the desired effect was achieved more efficiently, as indicated in table 18, table 19, and table 20. The focus group indicated that some alterations could be made to the heatmapping visualization to make it more understandable. These alteration were changing the scales to all be a scale of 1-5 and emphasizing the sustainable development activities and key competitiveness indicators more heavily. The preliminary design of the corporate decision tool is displayed in figure 28.

			Key competitiviness indicators (KCI's)						
			Financial competency	**Management compentency**	**Market share**	**Organisation competency**	**Social responsibility**	**Regional competitiveness**	**Technological capabilities**
	average score all SDA's on KCI →		2,94	2,68	2,41	2,39	2,33	2,16	1,81
	average score of SDA on all KCI's ↓								
sustainable development activities (SDA's)	**Green product development**	2,71	3,48	2,66	2,98	2,46	2,52	2,80	2,10
	Green profiling and marketing strategy	2,46	3,27	2,85	2,71	2,29	2,18	2,47	1,45
	Green supply chain management	2,36	3,05	2,56	2,27	2,20	2,26	2,07	2,10
	Green human resource management	2,29	2,40	2,75	2,17	2,73	2,43	1,89	1,67
	Green facility management	2,12	2,50	2,56	1,90	2,29	2,26	1,56	1,74

figure 28: preliminary corporate decision tool (own illustration)

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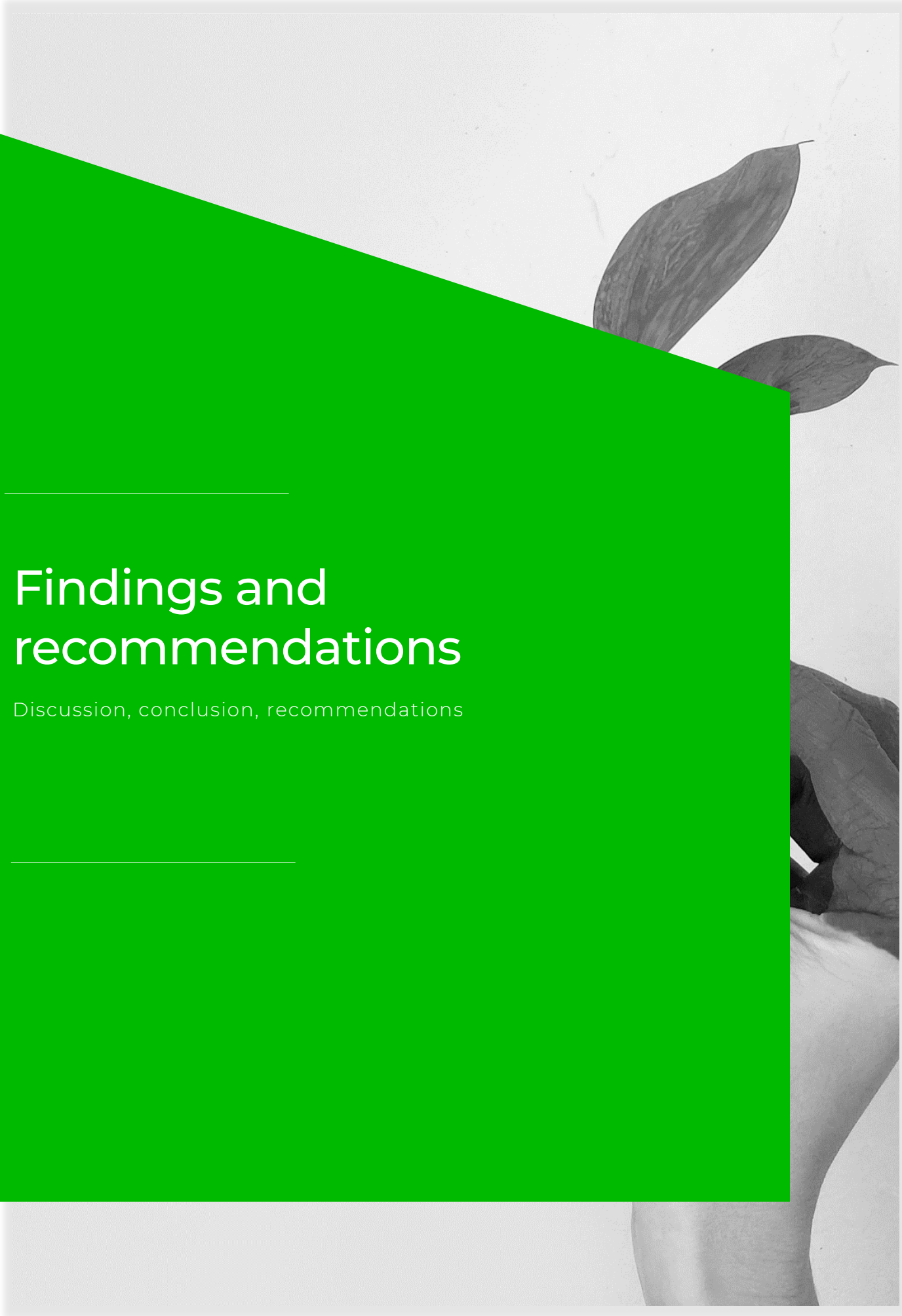
Findings and recommendations

Discussion, conclusion, recommendations



11 Discussion

This chapter aims to provide more insight in the meaning, importance, and limitations of the findings of this research. To achieve this, the chapter is divided into four different sections. First, a short summary of the findings is provided. It is important to note that the findings from the research are discussed more elaborately in the next chapter, the conclusion. Second, the interpretations of the results are provided. Third the implications of the results are given, by reflecting on the findings from literature in phase one. Lastly, the limitations of the research are provided, discussing to which extent the results of this research are valuable.

11.1 Summary of findings

The first phase of this research focused mainly on the findings from literature. These findings are reflected upon with the generated results of this research in section 11.3.

In the second phase of research, understanding the problem, the first results of the research were generated. Dutch RE developers were asked, by means of a survey, what is keeping them from implementing a more sustainable corporate strategy and what the average position is of a Dutch RE developer regarding sustainability. It was found that the financial barriers form the largest obstruction for Dutch RE developers to implement a more sustainable corporate strategy. Also it was found that sectoral responsibility, a lack of courage, consideration of sustainable solution within the project team, and a difference in interest between stakeholders also formed significant barriers for Dutch RE developers. The position, regarding sustainability, of the average Dutch RE developer was found to be 'compliance', in accordance with the five stages and emerging drivers of Senge et al. (2010). The compliance phase is characterized by companies who operate in a reactive manner in terms of sustainability to law and regulations set by the government. Entities that find themselves in the compliance phase do not proactively operate to implement sustainability into their corporate strategy. For this reason, no SDA's were excluded from this research.

In phase three of this research, the alternatives and criteria for the corporate decision tool were determined. Furthermore, an impact analysis, by means of a MCDA, was executed to gain an understanding of the relations between the alternatives and the criteria. The criteria, the key competitiveness indicators or KCI's, were determined using literature. It was found that a weighted summation of the score on these indicators, or criteria, is a successful method of determining the competitiveness of a firm (Zhang, Shen, Wu, & Fan, 2009). After an analysis of multiple international KCI sources, the results of Li (2011), were found to be the most comprehensive and applicable to this research. The list of KCI's that was adopted for this research is: management competency, organization competency, technological capabilities, financial competency, market share, social responsibility, and regional competitiveness (Li, 2011). To translate these barriers to be aligned with the Dutch RE development market and be able to make a weighted summation as suggested by Zhang et al. (2009), the respondents of the survey were asked to rate the KCI's using a Likert scale based on importance towards the competitiveness of Dutch RE developers. The weighted index that was adopted in this research can be found in table 15. The alternatives that had determined were the sustainable development activities or SDA's. These SDA's are umbrella terms which are characterized by a set of sustainable actions which can be implemented by Dutch RE developers. The SDA's which were adopted in the MCDA were green product development, green supply chain management, green human resource management, green profiling and marketing strategy, and green facility management. A complete overview of the impact analysis can be found in figure 19. The impact analysis is performed to gain a comprehensive understanding of the impact of the adopted SDA's on the adopted weighted KCI's, thereby gaining a better understanding of the impact of each SDA on the competitiveness of Dutch RE developers.

The last phase of this research focused on gaining a first impression of what is necessary to design a corporate decision tool which visualizes the results from the earlier phases of research. To find an applicable layout of the decision tool, three different visualizations of the MCDA were created based on literature. Throughout this phase of research, two main characteristics of a corporate decision tool were found to be of importance. First minimalizing the cognitive burden of the decision makers, and second allowing a decision maker to quickly focus on the important aspects of the findings. It was found that geometrical analysis for interactive assistance (Gaia) chart, heat mapping and parallel coordinate plots could all be used to successfully visualize the findings from the MCDA (Gettinger, Kiesling, Stummer, & Vetschera, 2011; Dulmin & Mininno, 2003). These three different visualizations were presented to a focus group to help decide which form of visualization was most successful

displaying the results without forming a cognitive burden for the decision makers. It was found that heat-mapping was most successful in limiting the cognitive burden whilst accurately displaying the results of the MCDA. Certain alterations were made to the design of the corporate decision tool, leading to a preliminary design. Further research is still required to reach a definitive design.

11.2 Interpretations

From the results of each of the phases numerous aspects become clear. From the second phase of research it became clear that Dutch RE developers are not significantly being withheld from implementing a more sustainable corporate strategy as indicated in the literature findings from phase one. When analyzing the results of the survey it becomes clear that Dutch RE developers generally have the means to become more sustainable, apart from affordable sustainable solutions. However, a number of individual barriers are found to form enough of an obstruction to find the larger part of Dutch RE developers in the compliance phase of sustainability. In this phase sustainability is still seen as a cost-driver and associated with complicated solutions. This explains that financial barriers were found to have the largest obstruction. In the later phases of research it was also found that supply and demand plays a large role preventing Dutch RE developers from obtaining a more sustainable corporate strategy. The demand for sustainable solutions in regards to real estate remains with certain parties. When RE developers do not work with the parties asking for these solutions, supplying them is often not done either.

From the third phase of research it became clear that all respondents believe that a competitive advantage can be gained from sustainable development. This confirms the assumption of a positive relation between sustainability and a competitive advantage. The results of the structured section of the semi-structured interviews (see figure 19) provide the first insights on the impact of the alternatives (SDA's) on the criteria (KCI's). Based on the respondents of the semi-structured interviews an order of highest to lowest impact on the competitiveness can be determined. This order is: (1) green product development, (2) green profiling and marketing strategy, (3) green supply chain management, (4) green human resource management, and lastly (5) green facility management.

From the fourth phase it became clear that translating the findings to a visualization which minimizes the cognitive burden on a decision maker and quickly allows to focus on the significant aspects of the visualization at hand are of importance to designing a corporate decision tool. Of the three visualizations which were presented to the focus group it was found that heat-mapping was most efficient in doing so. The output of phase three, displayed in figure 28, is a preliminary design of a corporate decision tool and acts as a stepping stone for further research.

11.3 Implications

The results in phase two, understanding the problem, concerning the barriers for obtaining a sustainable corporate strategy were not wholly aligned with earlier research discussed in phase one (first impressions and literature review). The list of barriers that were indicated by Regales (2017), Zhang et al. (2011), and Williams and Dair (2007), was found to be more extensive than what applied to the respondents of the survey. This indicates that Dutch RE developers do not experience as many barriers as is indicated in other studies. It is important to note that when looking at the individual results of the survey there is some discrepancy, see *appendix b – survey results*. Where some respondents indicated that a barrier did not withhold them from obtaining a more sustainable corporate strategy others did. The studies provided by Regales (2017) and Zhang et al. (2011) did not include to which extent a certain barrier was present in a market, unlike this research. However, the list of barriers of Williams and Dair (2007) did provide this for the English market. In this research two of the barriers provided by Williams and Dair (2007) averaged to be a positive score, indicating that the barriers withholding English RE parties from implementing sustainability are not aligned with the barriers withholding Dutch RE developers.

In the third phase of this research, the findings specifically for Dutch RE developers were found to be more aligned with previous research. From the interviews, several aspects that were found in earlier research were confirmed for the Dutch RE development market. First, during the interviews the descriptions of the five stages and emerging drivers of Senge et al. (2010) were found to be aligned with the description of Dutch RE developers. The reactive manner of parties finding themselves in the earlier phases of sustainability compliance

were noticeable in the interviews as well. Here parties mostly implemented sustainability due to law and regulations or to achieve a different end, such as signing with a new tenant. The parties who found themselves in the lower phases did not see the necessity to implement sustainable strategies yet did indicate that it could lead to a competitive gain. On the contrary, parties who found themselves in the higher phases of sustainability compliance did indicate that there was a large competitive advantage to be gained from sustainability. This is in line with description that parties in these phases realize the cost effectiveness of going beyond compliance and that payoffs begin to outweigh the initial investments. Furthermore, it was also found that Dutch RE developers realize that sustainability can lead to a much broader set of business opportunities when operating in the 'integrated strategy' phase (Senge, Smith, Kruschwitz, Laur, & Schley, 2010).

Also, section 4.1 indicated why the assumption of a positive relation between sustainability and a competitive advantage can be made. The reasoning behind the positive influence on a competitive advantage were diverse and were also found during the interviews held in the third phase of this research. Examples of this section that were found during the interviews include a positive influence on image and relational marketing, tenant and staff attraction, increase of product quality, improvement of management competency, and exploiting opportunities to answer to the wishes of an increasing number of customers (Jorge, Madueño, Martínez-Martínez, & Sancho, 2015; Dey, Malesios, De, Chowdhury, & Abdelaziz, 2019; Hojnik, Ruzzier, & Manolova, 2018; García-Sanchez, Gallego-Álvarez, & Zafra-Gómez, 2019; JLL, 2007).

In the fourth phase of this report, focusing on the design of the corporate decision tool, it was found that not all visualization techniques as suggested by Dulmin & Mininno (2003) and Gettinger et al. (2011) were successful in visualizing the results of MCDA's for decision makers. During the focus group it was indicated that the results of this research are best represented using heatmapping. The focus group indicated that, for this research, the GAIA chart and parallel coordinate plots did not provide enough information to be effectively used for prioritizing between different SDA's.

11.4 Limitations

There are some limitations which need to be taken into account for this research. In order to provide a clear understanding of what these limitations are, they are discussed for each individual phase below. Because the first phase of research only addresses literature, the limitations for this phase are not discussed.

In the second phase of research there are some limitations. First, the number of respondents of 383 to make the survey statistically significant was not achieved due to the time constraint in which this research was performed. Therefore, the results of the survey cannot be generalized for the entirety of the Dutch RE development market. Second, the translation of the barriers found from literature to survey questions also causes limitations. Translating the English barriers to Dutch, to make the survey applicable to the Dutch market, can cause loss of data. Furthermore, the barriers which were found in literature are described to be comprehensive and precise often resulting in a relatively long and complex description of those barriers. In the survey it was chosen to retain the description of the barriers found in literature. These descriptions can be hard to comprehend for respondents of the survey who have not spend time researching these topics. For those reasons the reliability of the data generated in this phase is impacted by the translation of the barriers to adequately fit the questioning of a survey.

In the third phase of research some limitations are present as well. To be able to effectively perform the impact analysis during this phase the alternatives (SDA's) and criteria (KCI's) were summarized using umbrella terms. These umbrella terms allowed to perform an impact analysis within the time constraint set for this research, however, the generalizability of the results is thereby effected. In To test if the results of the impact analysis can be generalized for the Dutch RE development market, further research is required which analyzes the impact of the individual sustainable actions on the individual components of the key competitiveness indicators. Due to the time and scope of this research these results cannot be gathered. In other words, the impact analysis of all the individual components allow a more accurate understanding of the topic than the impact analysis which utilizes the umbrella terms.

Another limitation during this phase of research is the indirect impact between different SDA's not being taken into account. For instance, to be able to develop green buildings (green product development) it is likely that a real estate developer automatically works with sustainable partners (green supply chain management). This makes it difficult assess the actual impact of a single SDA on the competitiveness of a firm. Even though the indirect impact is a desired result regarding sustainability, it does creates complications for the output of this

research. Due to a lack of data considering the compatibility between the different SDA's these results are not taken into account. To do so, further research is needed.

In the last phase of research the number of respondents limit the generalizability of the results. The number of respondents of the focus group was unfortunately limited to two respondents due to absence caused by COVID-19. Therefore the results of this phase only act as a stepping stone for further research. Due to the lack of diversity in respondents in this phase, the results cannot be considered as definitive, for this further research is required. Therefore the results of this phase act as a stepping stone for further research.

Lastly, another general limitation of this research is time. As indicated in the introduction of this research, sustainability is still a growing trend and more firms are implementing sustainability into their corporate strategies because this is becoming a precondition to remain competitive in today's market (Senge, Smith, Kruschwitz, Laur, & Schley, 2010). Because sustainability is considered a trend, it is not certain that it will continue to deliver a competitive advantage. The reason for this is that a competitive advantage needs to positively differentiate one entity from another, as indicated in phase one of this research. When Dutch RE developers progressively obtain more sustainability into their corporate strategy due this trend, it becomes harder for these parties to positively differentiate themselves from other by means of sustainability. Put simply, when a sustainable corporate strategy becomes standard, the possibilities to gain a competitive advantage from it become limited.

12 Conclusion

The purpose of this research was to gain an understanding of the impact of sustainable development activities on the competitiveness of Dutch real estate developers and give a first understanding of how a corporate decision tool can be designed allow Dutch real estate developers to prioritize between these alternatives. Therefore, the main research question in this report is stated as follows: *"What is the impact of sustainable development activities that go beyond-compliance on the competitiveness of private Dutch real estate developers?"* To draw a comprehensive conclusion six sub-questions were adopted in four different phases.

The first phase focused on examining current literature to form a foundation for the research, and gain a better understanding of the essential topics that are related to this research. Because the main research question relies on the assumption of a positive relation between sustainability and competitiveness, this assumption needed to be clarified. It was found that the assumption is reasonable to make for Dutch real estate developers due to numerous positive outputs. The positive outputs in the real estate development sector were, among others, seen in the cost effectiveness, ability to rent / sell, brand and reputation, improvement of product quality and being able to better answer to the demand of socially responsible investments (JLL, 2007; García-Sanchez, Gallego-Álvarez, & Zafra-Gómez, 2019; Dey, Malesios, De, Chowdhury, & Abdelaziz, 2019; Lin, Tan, & Geng, 2013). Moreover, Dutch real estate developers who utilize sustainability as one of their main domains have proven to compete at the top of the Dutch real estate development market.

On the contrary, through literature, thirty barriers were identified that are contributing to withholding real estate developers to become more sustainable. These barriers can be allocated to seven independent categories, namely, financial barriers, legislative barriers, knowledge barriers, internal- & external organizational barriers, and lastly technical barriers. It was found that in general financial barriers have to largest impact on preventing real estate developers from obtaining a more sustainable corporate strategy (Regales, 2017).

Before being able to collect data on the impact of sustainable measures on the competitiveness of Dutch real estate developers, three concepts needed to be understood. It needed to be comprehended how the competitiveness of real estate developers can be determined, what Dutch real estate developers can implement to obtain a more sustainable corporate strategy, and how the impact of those actions on the competitiveness of Dutch real estate developers can be measured.

To measure the competitiveness of Dutch real estate developers Zhang et al. (2009), analyzed multiple methods of which a weighted summation of key competitiveness indicators was found to be successful. To determine the key competitiveness indicators of real estate developers multiple studies were analyzed. It was found that the key competitiveness indicators provide by Li (2011) fitted the scope and the timeframe of this research most adequately and were therefore adopted in this research. The identified key competitiveness indicators are management competency, organizing competency, technological capabilities, financial competency, market share, social responsibility, and regional competitiveness. The weighted index of each of the key competitiveness indicators was determined through a survey.

The second variable of this research, what sustainable actions Dutch real estate developers can implement, were also partially found through literature. In literature twenty individual sustainable actions were identified. Due to the time constraint, and the realization that more sustainable actions would be found in practice during phase three, the individual sustainable actions were allocated to five umbrella terms referred to as sustainable development activities. The sustainable development activities that are adopted in this research are green product development, green supply chain management, green human resource management, green profiling and marketing strategy, and green facility management.

The second phase of this research was dedicated to understanding why Dutch real estate developers are not implementing a more sustainable corporate strategy and determining what the current position of the market is regarding sustainability compliance. This was an important step in the research to gain a better understanding of the underlying problem and explain why Dutch real estate developers are not implementing a more sustainable corporate strategy. By doing so, it could be determined what sustainable development activities the research should focus on. This phase focuses on answering the first two sub-questions.

To understand what is keeping Dutch RE developers from implementing a more sustainable corporate strategy, they were asked to what extent the thirty found barriers from literature are contributing to this problem in the Dutch real estate development market. This was done through a survey and provided the answer to the first sub-question.

SQ 1: What are the barriers that are withholding Dutch RE developers from implementing a more sustainable strategy?

It was found that financial barriers form the largest obstruction for becoming more sustainable along with some individual barriers from other categories. These barriers are sectoral responsibility, a lack of courage, consideration of sustainable solutions within the project team, and a difference in interest between stakeholders. Apart from these barriers, the legislative, knowledge, and technical barriers found from literature did not seem to have a significant impact on preventing Dutch real estate developers from implementing a more sustainable corporate strategy. Overall, the results indicate that the means to become more sustainable are present, yet a small selection of barriers are forming a large enough obstruction to prevent Dutch real estate developers from implementing a more sustainable corporate strategy as shown through the results of the next sub-question.

The second sub-question of this research focused on determining the current position of Dutch real estate developers regarding sustainability. To do so, the five stages and emerging drivers provided by Senge et al. (2010), were adopted. The five stages are divided into two separate categories, the reactive and proactive phases. The reactive phases are in line with the traditionalist view towards sustainability, where it is seen as a cost-driver due to high costs and complicated solutions (Cai & Li, 2018; Palmer, Oates, & Portney, 1995; Walley & Whitehead, 1994). The proactive phases are in line with revisionist view, where it is realized that sustainability can contribute to the competitiveness of a firm (Porter & van der Linde, 1995). To answer the second sub-question, Dutch real estate developers were asked to indicate in which of the five phases of sustainability compliance, as identified by Senge et al. (2010), the average Dutch real estate developers finds itself. The five stages of sustainability compliance adopted in this research are (1) non-compliance, (2) compliance, (3) beyond-compliance, (4) integrated strategy, and (5) purpose or mission (Senge, Smith, Kruschwitz, Laur, & Schley, 2010).

SQ 2: What is the current compliance 'compliance' position of Dutch RE developers in relation to sustainability?

87% of the respondents of the survey indicated that the average position of a Dutch real estate developer is 'compliance', and 13% indicated that the average position is 'beyond-compliance'. From this it can be concluded that the Dutch real estate development market mostly operates in reactive manner. Because it was found that this is the average perceived position of the market, no SDA's or individual sustainable actions were excluded from this research. Also, it supports the findings of earlier phases of research that often real estate developers do not translate the awareness of the sustainability to practice.

The third phase of this research focused on the identifying the variables necessary to perform an impact analysis between the sustainable development activities and competitiveness of Dutch real estate developers. It was found that a multi-criteria-decision-analysis allows to understand the impact of sustainable development activities on the competitiveness of Dutch RE developers. To perform a MCDA two variables are needed, first the criteria against which the alternatives are tested, and second the alternatives that can be implemented. As determined in the first phase of this research, the criteria are key competitiveness indicators (KCI's), and the alternatives are sustainable development activities (SDA's). The third phase of this research focused on answering sub-questions 3-5.

To identify the different KCI's of Dutch real estate developers multiple sources of literature were analyzed. After finding a comprehensive source to identify the different KCI's, Dutch real estate developers were asked to which extent these KCI's were of importance to the Dutch real estate development market. thereby applying the previous found KCI's to the Netherlands and providing the answer to the third sub-question of this research.

SQ 3: What are the key competitiveness indicators (KCI's) that determine the competitiveness of Dutch RE developers?

The KCI's for real estate developers were found to be management competency, organization competency, technological competency, financial competency, market share, social responsibility, and regional competitiveness (Li, 2011). In order determine to which extent these indicators are of importance to Dutch RE developers and determine the weighted index as suggested by Zhang et al. (2009), Dutch RE developers were asked to indicate the level of importance on a scale form 1 (not at all important) to 5 (extremely important) by means of a survey. The average results are indicated in the table below.

table 21: weighted index per KCI from survey (own table)

KCI	Management competency	Organizing Competency	Technological Capabilities	Financial competency	Market share	Social responsibility	Regional competitiveness
Average	3.94	3.52	2.90	4.35	3.61	3.35	3.29

The survey respondents indicated that the financial competency was the most important KCI for determining the competitiveness of Dutch RE developers whereas the technological capabilities were found to be the least important. These values are included in the MCDA as weighted indexes to determine the overall contribution of SDA's on the competitiveness of Dutch RE developers.

To answer the fourth sub-question of this research literature was used in combination with semi-structured interviews. Through literature 20 individual actions that contribute to the sustainability were identified and allocated to five independent SDA's. The adopted SDA's from literature are green product development, green supply chain management, green human resource management, green profiling and marketing strategy, and green facility management. In the earlier stages of research it was found that many actions and / or SDA's would be found in practice, therefore, the semi-structured interviews were used to continue finding actions and SDA's. The semi-structured interviews provided a full list of sustainable actions and SDA's, thereby answering the fourth sub-question of this research.

SQ 4: Which sustainable development activities (SDA's) can be implemented by Dutch RE developers?

A full overview of the sustainable actions and SDA's found from literature and the semi-structured interviews can be found in the table below.

table 22: complete overview of actions and SDA's (own table)

Green Product Development	Green Supply Chain Management	Green Human Resource Management	Green Profiling and Marketing Strategy	Green Facility Management
Maximize score on BREEEAM	Work with sustainable parties in project team	Value- based recruitment (focus on sustainability)	Profile the company as 'sustainable'	Act in a sustainable manner within the company
Maximize score on LEED	Business – environmental group partnerships	Employee training in sustainability	Emphasize on sustainability in online marketing	Invest in sustainability in personal investments (ownership)
Maximize score on WELL	Work with innovative partners	Employee development in sustainability	Become a certified B corporation	Use smart data to improve real estate performance
Maximize score on Green rating	Exclude partners using selection criteria	Talent management	Knowledge sharing	Sustainable housing of offices
Integrate circularity into developments	Utilize sustainable investors	Performance management	Exemplary function in regard to sustainability	Encourage a sustainable culture within the firm
Develop flexible buildings	Maintain sustainable relationships	Incentive systems in accordance with the corporate sustainability strategy		
Minimize effect on transport		Employee health		
Utilize Global ESG Benchmark (GRESB)		Retain employees		
Develop to have livability / societal positive effect				
Develop using Biophilic Design				
Develop climate adaptive buildings				
Increase the life cycle of buildings / products				
Add vegetation to public space				

As can be seen in the table no additional SDA's were found during the semi-structured interviews yet the individual actions nearly doubled. Due to the time constraint of this research, performing an impact analysis of the individual sustainable actions is not possible, therefore the SDA's are adopted in the MCDA.

After finding the weighted criteria, the KCI's, against which the alternatives, the SDA's, would be tested it was possible to perform an impact analysis using a multi-criteria-decision-analysis. Thereby providing the answer to the fifth sub-question of this research.

SQ 5: To what extent do the SDA's taken by Dutch RE developers impact their KCI's in the real estate market?

During the structured section of the semi-structured interviews the respondents were asked to indicate the level of positive impact of a SDA on a KCI. The average output of the interviews is displayed in figure 29 (a larger example is provided on page 53).

What is the impact of the SDA's on the KCI's?		KCI's							
		Management compentency	Organisation competency	Technological capabilities	Financial competency	Market share	Social responsibility	Regional Competitiveness	
SDA's	Green product development	2,66	2,46	2,10	3,48	2,98	2,52	2,80	**19,00**
	Green Supply Chain Management	2,56	2,20	2,10	3,05	2,27	2,26	2,07	**16,51**
	Green Human Resource Management	2,75	2,73	1,67	2,40	2,17	2,43	1,89	**16,04**
	Green profiling and marketing strategy	2,85	2,29	1,45	3,27	2,71	2,18	2,47	**17,21**
	Green facility management	2,56	2,29	1,74	2,50	1,90	2,26	1,56	**14,81**
		13,38	**11,95**	**9,07**	**14,70**	**12,03**	**11,66**	**10,79**	

figure 29: average results semi-structured interviews (own illustrations)

It was found that between the studied SDA's, green product development has the highest contribution towards the competitiveness of Dutch RE developers. During the interviews it was indicated numerous times that developing buildings is the core of real estate development therefore it is logical that the largest impact can be achieved by investing in sustainability in the buildings being developed. The second largest impact on the competitiveness was measured on the green profiling and marketing strategy. Interview respondents indicated that communicating the capability of providing sustainable solutions allows others, such as investors or tenants, to be aware that you can answer to the growing demand for sustainable solutions as indicated in the introduction of this report. Green supply chain management was found to have the third largest impact of the SDA's, with a score marginally higher than green human resource management. During the semi-structured interviews it was found that Dutch RE developers work together wit a variety of partners within a project. Therefore working these parties and remaining sustainable relationships will allow better cooperation to reach the goals in an effective and efficient manner. Green facility management was found to have the lowest impact on the competitiveness of a Dutch real estate developer, mostly because it was implemented internally.

The interviews also provided some compelling findings which were discussed in a focus group. It was found that real estate developers sometimes search for payoffs of sustainable measures on a project level, yet the impact is usually noticed on a wider company level. The focus group indicated that the reasoning for this is supply and demand. Parties who find themselves in the lower phases are often not asked to supply sustainable solutions and therefore lack the opportunity to experience the positive outputs of sustainability on a company wide level. Second, the financial barriers form the largest obstruction for becoming more sustainable, yet the largest competitive gain can also be achieved in financial capabilities. This finding was also explained due to supply and demand, and that the Dutch real estate development market is not transparent regarding financial gains. Third it was found that all respondents of the interviews acknowledged that a competitive gain can be achieved through sustainability yet the average Dutch real estate developer, as found in phase two, only complies with law and regulation. The respondents of the focus group indicated that even though it is possible to gain a competitive advantage it is not easy to positively differentiate yourself as a real estate developer by means of sustainability. The reason for this is that sustainability requirements of clients and law and regulations are increasing, thereby leaving less opportunities to implement sustainable measurements because a significant amount of measurements is already needed to meet the minimal requirements.

Sub-question six of this research was answered in the last phase of research. Due to the generalizability of the results from the previous phases and the time constraint on the research, this phase focused on providing a first understanding and the building blocks to design a corporate decision tool. Through literature, three different

methods of visualizing the results of MCDA's were identified. The visualization techniques are GAIA charts, heat-mapping, and parallel coordinate plots. In a focus group each of the visualizations were discussed. Furthermore, a preliminary design was found, thereby providing the answer to the last sub-question of this research.

SQ 6: How should a corporate decision tool be designed to allow RE developers to effectively prioritize between SDA's to improve their competitiveness?

It was found that there are two important aspects when translating the findings of the MCDA to a corporate decision tool. The first is to minimize the cognitive burden on a decision maker. The second is to quickly allow a decision maker to focus his/her attention on the important aspects represented in the corporate decision tool. It was found that heat-mapping (see figure 23) is most successful in displaying the results of the MCDA to prioritize between SDA's with a minimal cognitive burden. The reasons for this is that it easily allows to focus on the important aspects of the findings, it can order the findings using the earlier adopted scoring system, and provides enough information to require a minimal amount of explanation to understand. Based on the discussions held during the focus group some alteration were made to lead to a preliminary design of this visualization technique, see figure 28. This preliminary design of a possible corporate decision tool showcases the findings of the previous phases of research.

Through answering each of these individual sub-questions a answer to the main research question can be formulated.

What is the impact of sustainable development activities on the competitiveness of Dutch real estate developers?

It was found that all sustainable development activities adopted in this research are likely to enhance the competitiveness of Dutch RE developers, some to a larger extent than others. The order from most significant to least significant impact of the sustainable development activities on the competitiveness of Dutch real estate developers is as follows (1) green product development, (2) green profiling & marketing strategy, (3) green supply chain management, (4) green human resource management, and (5) green facility management. Because the impact of the alternatives were tested against key competitiveness indicators, it is also possible to determine where the enhancement of the competitiveness can recognized. The order of the highest to lowest impact on the key competitiveness indicators is as follows: (1) financial capabilities, (2) management competency, (3) organization competency, (4) market share, (5) social responsibility, (6) regional competitiveness, and lastly (7) technological capabilities. In order to make these results more applicable to practice a preliminary design was made in an attempt to minimalize the cognitive burden of a decision maker who wants to prioritize between the different sustainable development activities. This visual representation of the findings is displayed in figure 30, a larger example is provided on page 69.

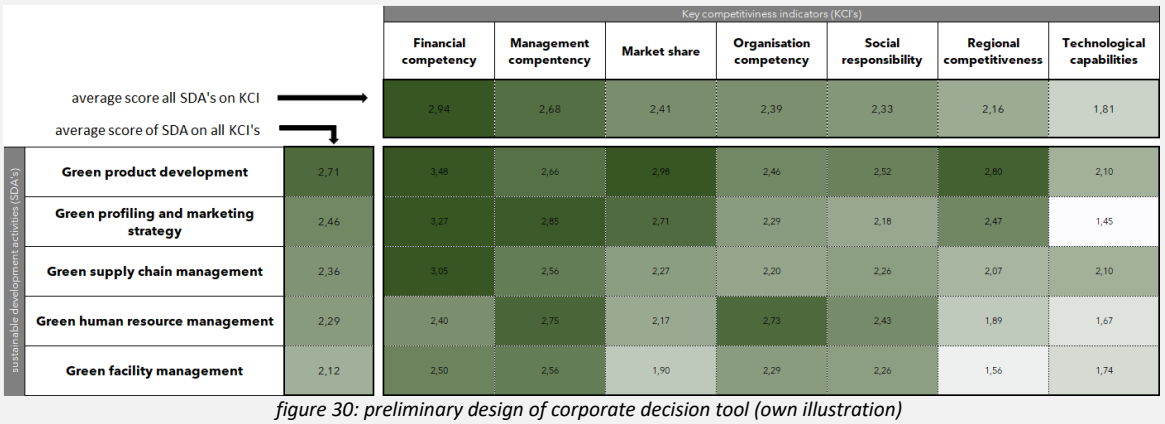


figure 30: preliminary design of corporate decision tool (own illustration)

13 Recommendations

Throughout report certain recommendations have been identified for practice and for further research. This section addresses the recommendations of this research for practice (Dutch real estate developers) and for future research (academics).

13.1 Recommendations for practice

Based on the conclusions of this research, Dutch real estate developers should consider to obtain a more sustainable strategy because it can lead to a gain in competitiveness. The reasons to become more sustainable are much more diverse than this, however, these argumentations were not taken into account during this research.

As mentioned in the limitations of this research, time is also a pressing factor for enhancing the competitiveness through sustainable development. Due to the higher demands enforced through regulations it is possible that the competitive gain from sustainable development will become harder to achieve. The reason for this is that when the demands of sustainability become higher the possibilities to positively differentiate become limited. Therefore, Dutch real estate developers who desire to achieve this effect should act relatively quickly. As shown in the second phase of this research, the market still finds itself in the reactive phases of sustainability compliance, therefore opportunities are still present to proactively implement sustainable development into a corporate strategy. It can also be considered to focus specifically on the topics of sustainability which are being implemented less in general, for example, the social aspects of sustainability.

Also, when deciding whether certain sustainability measures should be taken, the payout of those measures should not be sought within a single project because, as shown in phase three, the competitive payout is often found on other levels of competitiveness. Considering to become more sustainable should therefore be implemented in the corporate strategy of a Dutch RE developer which will in turn be reflected in the sustainability of the projects. Also practitioners should take the current position of their firm into account. If a firm is already performing well on i.e. financial competency, it should be considered to not take this KCI into account. The results of the impact analysis and order in which the SDA's score the highest might change, depending on this situation.

13.2 Recommendations for future research

For future research, certain aspects can be considered as well. First a more in-depth analysis to determine the impact of a SDA on the KCI's can be achieved. To do so, a single SDA can be researched and the individual actions that form that SDA can be obtained in an impact analysis. By doing so, the impact of the SDA on the KCI's can be considered on a more detailed level leading to more accurate results. If this is done it is important that the research for each of the SDA's is done using the same technique / method to compare the results of each of the SDA's in the end.

Another aspect that can be analyzed more in-depth is the compatibility between different SDA's. In section 4.5.1 it was explained how the House of Quality method of an MCDA can be utilized to achieve this. This was not done in this research because it did not fit the scope or the timeframe of this research. When doing so, careful considerations need to be made when translating these finding to a corporate decision tool as discussed in section 10.

Also this research can be executed replacing the term sustainable development activities to a different variable. This shows how the impact of, for example, high-end architectural design can lead to a gain in competitiveness for Dutch RE developers. By doing so, a comparison can be made between the impact of different variables on the competitiveness of Dutch RE developers. This would allow decision makers, such as Dutch RE developers, to prioritize between different techniques for enhancing their competitiveness. It is important to note that this is not aligned with the problem statement of this research, however, in practice it is a viable option.

Furthermore, it was noticed that there is a discrepancy in opinions between real estate developers in different sectors. It was found that RE developers in different sectors, i.e. retail, housing, offices, had a different perspective towards sustainability and noticed that certain sectors found specific SDA's to play a larger role for them as a firm. Therefore, further research could specify a similar approach to a specific sector of real estate development.

The last phase of this research is focused on designing a preliminary design of a corporate decision tool which can be used as a stepping stone for further research. It is therefore important to clarify how further research can be executed. As mentioned before, the last phase of this research was limited due to the number of respondents achieved through the focus group, however, the findings do provide a first idea of what aspects are of importance when designing a corporate decision tool. It was found that a corporate decision tool should minimize the cognitive burden of a decision maker and allow them to focus their attention on the aspects that are of importance for the decision to be made. In further research the consideration can be made to implement forementioned changes, such as a more in depth analysis of the impact of SDA's on the KCI's to gain a more accurate foundation for the corporate decision tool. Thereafter, more visualizations can be created specifically focused on minimizing the cognitive burden and allowing a decision maker to focus their attention on the important aspects. These visualizations can then be presented to a new focus group to find which corporate decision tools is most appreciated. When this focus group is not given an introduction on the topic prior to the meeting it can also be researched whether or not the tool is understandable without explanation and therefore easier to use in practice. To achieve a definitive design this process can be repeated by altering the tool based on the recommendations of a focus group and then presenting the changes to a new focus group. Multiple rounds of external validation will lead to a more complete design of the tool.

14 Reflection

This chapter is dedicated to reflecting on multiple aspects of this research. These aspects are the approach, the feedback from my mentors, translation of the feedback in my research, how I've learned from my own work, the relation between my graduation topic and the mastertrack and masterprogram, and the relation between the research and a wider social, professional and scientific framework. Lastly the personal study targets adopted prior to executing the research are reflected upon as well.

The approach of adopting different phases in the research worked well towards finding an answer to my main research question. Through adopting the phases the process became logical and structured, allowing to comprehend what was required before moving to the next phase of research. In hindsight, I am glad I took the time to structure the report in this manner before starting the actual research.

In the research a multitude of methods were used to gain data that contributed towards answering the main research question. In general the methods that were applied worked in supplying the necessary information to formulate an answer, however, there was one exception. The survey which was distributed in networks and other places after P2, was found to be too extensive and complicated by some respondents. Before finalizing the survey numerous attempts were made to shorten and simplify the survey, however, the prior done literature research made this difficult. Also, within the timeframe of this research it was desired to answer a larger number of sub-questions by means of the survey. The combination of these elements caused the problem of the survey being too extensive. In hindsight I would consider addressing less complex topics in the survey. Despite the survey being too extensive, the interviews were found to be comprehensive. The main reason, which I found, is that the interviews allowed a more in-depth conversation to explain the topics of the research. This same conclusion was drawn during the exploratory interviews. It seems as if the topic of sustainability and generating a competitive advantage is found to be complex. Because of this, engaging in a conversation allowed a better understanding of the topics, which in turn led to more thorough answer. Lastly, the focus group which was used to determine the visualization of the design was held with two people instead of three, due to a last minute cancelation because of a COVID-19 infection. This was unfortunate but could not be helped. The held discussions in the focus group were still successful yet lacked some diversity to the absence of a third or fourth member.

Throughout the research my mentors, both from university and NEOO, provided input for the methodology, survey, interviews, and focus group of the research several times. The feedback provided by my mentors from TU Delft provided academic support in formulating my questions and methodology, whereas the feedback from NEOO provided insight towards translating the academic knowledge to practice. The former provided me with the knowledge to design a effective research method and understand how to work towards answering a research question. I found that the latter was of great value as well. Academic terminology and methods are of great value for writing a thesis, but when relying on qualitative data from practice, the translation to fit the market needs to be made.

The feedback of my mentors was mostly translated in designing a more efficient survey and interview. Even though I already mentioned that this was hard to achieve with the survey, significant progress was made through the reflection. This same process proved to improve the efficiency and effectiveness of the interviews which were held in a later phase.

Executing this research provided a lot of insight in different manners. First, my knowledge on understanding how to effectively do research vastly increased. Before starting the research I thought that two semesters (20 weeks) was a large amount of time to design a research and gain a general understanding of the topics. Looking back I realize that taking the time to design a methodology and understanding how to execute the research not only helps, but is necessary to answering a research question in a comprehensive manner. Second, I gained a lot of knowledge in the topics discussed throughout the research. Understanding the barriers that are withholding RE developers from implementing a more sustainable corporate strategy provided insight towards the current state of the market and what motivates RE developers regarding sustainability. The interviews gave a better understanding of how RE developers in the Netherlands operate regarding sustainability. Also, it showed that every RE developer is a different firm with it's own identity and ways of operating. This along with the fact that nearly every RE project is unique makes it difficult to design a single approach towards gaining a competitive advantage through sustainability.

I believe there is a significant relationship between this topic and the master track Management in the Built Environment and the master program Architecture, Urbanism and Building Sciences. As mentioned in the introduction, sustainability (still) is a topic which can no longer be ignored. Because the environment is at a critical point, the implementation of sustainability is of great importance and cannot wait any longer. Therefore the large component of successfully managing, controlling, and developing projects taught in MBE has to be done with taking sustainability into account. In a wider social and professional framework this research can contribute towards a faster transition to a more sustainable built environment. As indicated in the research the true understanding of sustainability seems to be lacking among some real estate entities in the market thereby limiting their vision of what can be done to become more sustainable. I believe that through supplying the knowledge on what can be done as a RE developer to become more sustainable and showcasing what the positive impact is on something that all parties desire, a competitive advantage, real estate developers might be more inclined to implement a sustainable development strategy. I realize that further research is required to effectively do so, however, during the conversations held with professionals it was indicated multiple times that the topic of this research made them reconsider their perspective towards sustainable development.

Prior to starting this research I adopted several study targets. The first study target was to gain more insight in the reasoning behind business decisions of real estate developers. This study target was partially achieved. Throughout the many conversations I held with Dutch real estate developers the reasoning behind business decision concerning sustainability were discussed in vast amounts, however, decisions not concerning sustainability were only addressed in small amounts. Because sustainability is a rather specific topic it is unlikely that the same considerations are made in all other facets of the development process. Luckily the internship at NEOO did contribute to this study target by working on projects besides working on my thesis. The second study target was to gain a better understanding of what it means to compete within the Dutch real estate market, and how companies operate to do so successfully, was achieved. Through the literature study on how the competitiveness of Dutch RE developers can be determined and discussing this topic in-depth through semi-structured interviews I believe I have a good understanding of what is means to compete within the Dutch RE development market. I found that competing in the Dutch RE market is much more than doing successful projects. I found that, among others, relations, a good marketing strategy, and a finding the right partners also plays a large role in competing in the Dutch RE development market. My third and last personal study target was gaining knowledge on what can be done to allow a faster transition towards a more sustainable built environment regarding RE estate development. Through studying the sustainable actions and SDA's which can be implemented by Dutch RE developers, my knowledge in this field definitely increased. I was surprised to find as many sustainable actions as I did during the research. In the early phases I set out to test the individual actions, however, in the process it quickly became clear that this would be impossible in the timeframe set out for this research.

Looking back at the entire process of writing this thesis I am very pleased with the outcome. Not only of the report itself, but also with the progression I made throughout the process. I am glad to finish my studies and look forward to taking this knowledge to practice.

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15 Appendixes

- A – Survey questions
- B – Survey results
- C – Interview results
- D – Focus group results

Appendix A – survey questions

Competitief voordeel door duurzaamheid voor Nederlandse Vastgoed Ontwikkelaars

Geachte heer/mevrouw,

Dank dat u mee wilt werken aan dit onderzoek. Deze enquête maakt deel uit van mijn master scriptie voor de opleiding Management in the Built Environment aan de Technische Universiteit Delft. In het onderzoek probeer ik de impact van duurzaamheid ambities en maatregelen op bedrijfs- en projectniveau op het competitieve voordeel van Nederlandse vastgoedontwikkelaars te achterhalen en te vertalen naar een beslismodel.

De enquête bestaat uit 3 onderdelen; (1) het meten van de impact van barrières die het implementeren van een duurzame bedrijfsstrategie voor Nederlandse vastgoedontwikkelaars verhinderen, (2) het vaststellen van de huidige positie van de Nederlandse vastgoedontwikkeling sector met betrekking tot duurzaamheid, en (3) het bepalen van indicatoren die het mogelijk maken om te meten hoe competitief een Nederlandse vastgoedontwikkelaar is. De duur van de enquête is +/- 10 minuten.

De volgende punten zijn belangrijk om te vermelden voorafgaande aan de enquête:

- Deelname aan dit onderzoek is uitsluitend bedoeld voor Nederlandse vastgoed ontwikkelaars
- Deelname aan deze enquête is geheel vrijwillig en u kunt de enquête stoppen wanneer u wil, door vroegtijdig te stoppen ontvangt niemand uw antwoorden
- De resultaten van het onderzoek zullen volledig anoniem blijven
- De individuele resultaten van het onderzoek worden niet vrij gegeven, deze blijven in bezit van mijzelf en kunnen alleen worden ingezien via een verzoek.
- Voor vragen gedurende de enquête kunt u mij bereiken op: p.p.lambert@student.tudelft.nl
- Aan het einde van de enquête krijgt u vrijblijvend de mogelijkheid om uw email adres op te geven voor een kopie van de onderzoeksresultaten na afronding van het onderzoek.

Bij voorbaat dank,

Pim Lambert

Onderdeel 1: Invloed van barrières op het implementeren van een duurzame bedrijfsstrategie

In dit onderdeel zullen een aantal barrières worden genoemd. U wordt gevraagd om aan te geven in hoeverre u het eens / oneens bent met dat de barrière het implementeren van een duurzame bedrijfsstrategie verhinderd voor Nederlandse vastgoedontwikkelaars. De definitie van een ‘duurzame bedrijfsstrategie’ (voor dit onderzoek) is:

Een duurzame bedrijfsstrategie bestaat (deels) uit principes die streven naar het elimineren van onze bijdrage aan …:

1. … systematische toename van verwijderen van stoffen uit de aardkorst
2. … systematische toename van concentraties van stoffen die door de samenleving worden geproduceerd
3. … systematische fysieke aantasting van de natuur
4. … omstandigheden die het vermogen van mensen om hun behoeftes te voorzien systematisch ondermijnen

In hoeverre vindt u dat de barrière een duurzame bedrijfsstrategie in de weg staat?

	Sterk mee oneens	Oneens	Neutraal	Eens	Sterk mee eens
	-2	-1	0	1	2
De kosten van duurzaamheidsmaatregelen					
De financieringsmogelijkheden voor duurzaamheidsmaatregelen					
Het gebrek aan geschikte duurzame business cases					
De risico's van duurzame maatregelen					
Het 'split-incentive'* dilemma					
De korte betrokkenheid bij een project					
De regel geving					
Het gebrek aan flexibiliteit door wet en regelgevig					
Het gebrek aan ambitie / visie voor duurzaamheid vanuit de wetgeving					
Het protest / de bezwaren van andere actoren					
Het gebrek aan kennis, bewustzijn en/of expertise omtrent duurzaamheid					
Het gebrek aan ondersteuning voor onderzoek, leren en pilot projecten					
Het gebrek aan kennis overdracht					
Het gebrek aan kennis omtrent BREEAM-NL					
Het gebrek aan coördinatie in en tussen verschillende organisatie niveaus					
Sectorale verantwoordelijkheid in plaats van een collectief interesse					
Het gebrek aan leiderschap capaciteit en kennis voor complexe, multi-sectorale projecten					
Het gebrek aan moed					
Het gebrek aan ondersteuning / begeleiding					
Het gebrek aan overwegen van duurzaamheid in het project					
Het gebrek aan macht om duurzaamheidsmaatregelen te implementeren					
Het gebrek aan overwegingen omtrent duurzaamheid vanuit de opdrachtgever					
Het afkeuren van duurzaamheidsmaatregelen door toezichthouders (extern)					
Het te laat betrokken worden in het ontwikkelproces					
Risico's door verschillende contractvormen en veranderende bouwplaats praktijken / gedrag					
Conflicten in interesses tussen verschillende stakeholders					
Het technisch niet kunnen implementeren van duurzaamheidsmaatregelen door project omstandigheden					
Het gebrek aan toepasbare duurzame materialen / producten / systemen					
Het gebrek aan duurzaamheidsoplossingen					
De complexe technische toepassing van duurzaamheidsmaatregelen					

* Split incentive dilemma

* Het "split incentive dilemma" is het verschijnsel dat (duurzaamheid)maatregelen niet worden gerealiseerd doordat de motieven van de gebouweigenaar (verhuurder) en de huurder niet overeen komen. De eigenaar betaalt voor het verduurzamen van een gebouw, terwijl de huurder profiteert van de voordelen, bijvoorbeeld door een lagere energierekening.

Onderdeel 2: constateren van de positie met betrekking tot duurzaamheid van de Nederlandse vastgoed- en gebiedsontwikkeling sector

Voor dit onderdeel wordt u gevraagd de bijgevoegde tabel aandachtig te lezen. Mocht de afbeelding te klein zijn om te lezen kunt u inzoomen op uw scherm om de afbeelding te vergroten.

Fase	Omschrijving
Voldoet niet aan wet en regelgeving	- reageren op externe wet en regelgeving. In deze fase voldoet de Nederlandse ontwikkel markt niet aan de wet en regelgeving die wordt opgedragen vanuit de overheid
Voldoet aan wet en regelgeving	- reageren op externe wet en regelgeving. In deze fase voldoet de Nederlandse ontwikkel markt aan de wet en regelgeving maar gaat ook niet verder dan dat
Voorbij wet en regelgeving	- proactief handelen met betrekking tot duurzaamheid - de kosten effectiviteit van duurzaamheid wordt gerealiseerd door de markt en de winst begint aanzienlijk groter te zijn dan de originele investeringen. Dit kan leiden tot het zogeheten sneeuwbal effect waar de herinvesteringen van de winsten tot meer winsten kunnen leiden, dit geldt ook voor het imago en reputatie van het bedrijf.
Geïntrigeerde strategie	- duurzaamheid is volledig geïntrigeerd in de bedrijfsstrategie - er word proactief duurzaamheidsfactoren in elk facet van de bedrijfsstrategie geïntrigeerd - het management van het bedrijf heeft duurzaamheid als domein - duurzaamheid is onderdeel van de kern van de bedrijfsstrategie - duurzaamheid heeft een directe invloed op de financieringskeuzes, ketensamenwerking, het nastreven van nieuwe markten, en onderzoek
Doel / missie:	- bedrijven zijn vaak begonnen door individuen die de duurzaamheidsmogelijkheden inzagen voordat andere bedrijven überhaupt aan wet en regelgeving voldeden - moedig declareren (vaak zonder door de voorgenoemde fases te gaan) de missie of doel van het bedrijf is om bij te dragen aan de samenleving en 'herstellend' handelt

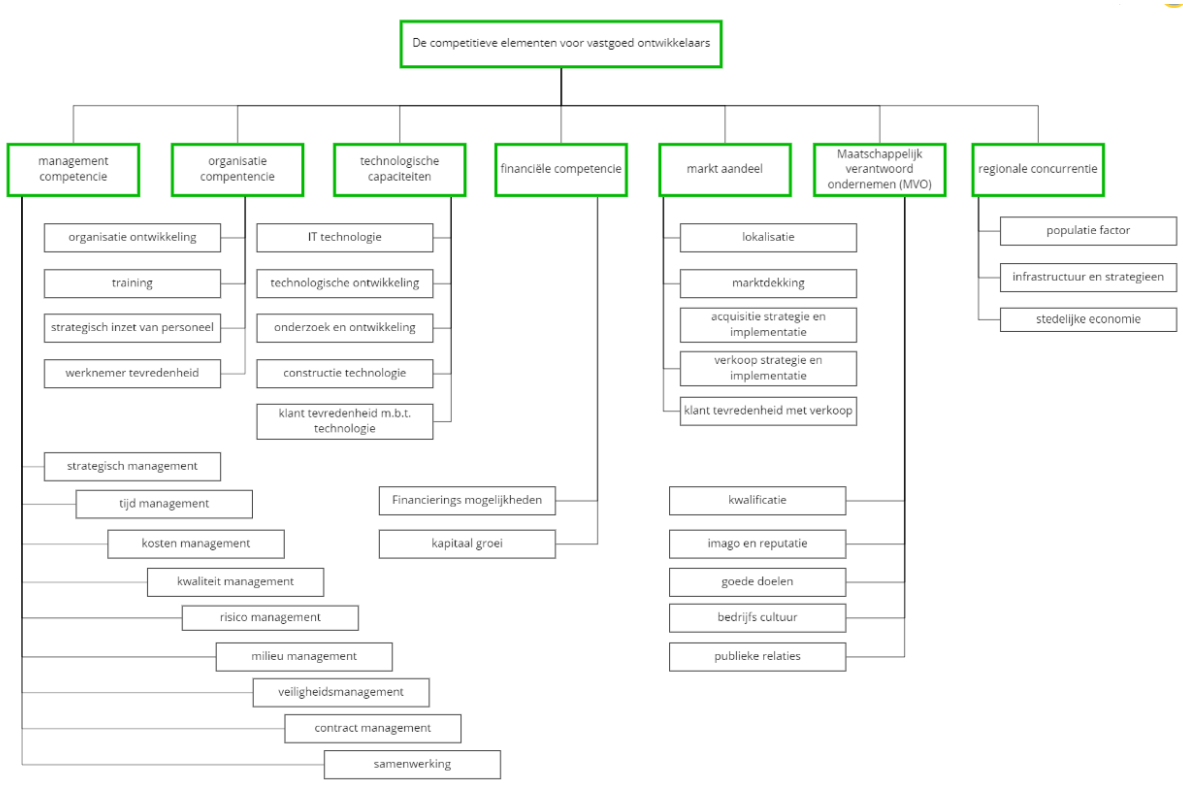
In welke van de 5 fases van duurzaamheid denkt u dat een gemiddelde Nederlandse vastgoed ontwikkelaar zich bevind?

- Voldoet niet aan wet en regelgeving
- Voldoet aan wet en regelgeving
- Voorbij wet en regelgeving
- Geïntrigeerde strategie
- Doel / missie

Onderdeel 3: KCI's

KCI's of Key Competitiveness Indicators zijn indicatoren die gezamenlijk kunnen meten hoe competitief een bedrijf is. In andere woorden: wanneer een bedrijf goed presteert op de verschillende KCI's kan gesteld worden dat het bedrijf goed presteert in de markt waarin het zich begeeft.

Op basis van literatuur zijn de volgende KCI's gevonden en gecategoriseerd. Analyseer de afbeelding en geef vervolgens aan in hoeverre u denkt dat de categorie van KCI's een belangrijke rol speelt in de Nederlandse vastgoed-ontwikkeling sector. Mocht de afbeelding te klein zijn om te lezen kunt u inzoomen op uw scherm om de afbeelding te vergroten. Voor elke categorie is een betekenis gegeven onder de vraag mocht er een definitie benodigd zijn om antwoord te geven op de vraag.



Geef aan in hoeverre u denkt dat de indicator van belang is voor hoe competitief een Nederlandse ontwikkelaar is:

KCI	Totaal niet belangrijk	Enigszins belangrijk	Belangrijk	Heel belangrijk	Extreem belangrijk
	1	2	3	4	5
management competentie (succesvol (project)management)					
organisatie competentie (goed voor en met personeel)					
technologische capaciteiten (kennis en implementatie van technologie)					
financiële competentie (beschikking over kapitaal en financiële groei)					
markt aandeel (formaat van het bedrijf)					
maatschappelijk verantwoord ondernemen (MVO)					
regionale concurrentie (lokaal concurrerend)					

Management competentie:
Management competentie is het managen van de activiteiten om de gestelde doelen en doelstellingen te bereiken door de beschikbare middelen efficiënt en effectief te gebruiken. Met betrekking tot vastgoed ontwikkelaars ligt de management competentie rond de activiteiten rond de realisatie van waarde in de ketensamenwerking.

Organisatie competentie:
Organisatie competentie is het vermogen om te motiveren binnen de organisatie, waaronder disciplines zoals organisatiegedrag, human resources en management een rol spelen. Het reflecteert de situatie van de structuur met betrekking tot de organisatie. Belangrijke aspecten voor organisatie competentie zijn: ontwikkeling van de organisatie, training, strategische inzet van personeel, en werknemer tevredenheid binnen de organisatie.

Technologische capaciteiten:
De technologische capaciteiten van een Nederlandse ontwikkelaar worden weerspiegeld door aspecten als IT-technologie, technologische vooruitgang, onderzoekscapaciteit, bouwtechnologie en de tevredenheid van de

consument over de toegepaste technologie. Net als de andere hoofdonderdelen bestaat de 'technologische capaciteit' uit meerdere onderdelen (zie afbeelding).

Financiële competentie:
Aangezien de vastgoed ontwikkelingssector een kapitaalintensieve sector is, heeft de financiële situatie altijd invloed op de activiteiten van vastgoedontwikkelaars. De financiële competentie van ontwikkelaars kan worden gemeten aan de hand van de twee aspecten financieringsmogelijkheden en kapitaalgroei.

Markt aandeel:
Het marktaandeel is een factor die het percentage of aandeel van de totale beschikbare markt weerspiegelt dat door een bedrijf wordt bediend. Het kan de positie van een bedrijf op de markt verlichten en ook het concurrentievermogen van een bedrijf weergeven. Daarom is het opgenomen in het evaluatiesysteem voor concurrentievermogen. In termen van de vastgoed ontwikkelingssector kan het marktaandeel worden geschat aan de hand van vijf aspecten zoals lokalisatie, marktdekking, grondverwervingsstrategie & -implementatie, verkoopstrategie & -implementatie en klanttevredenheid over de verkoop van onroerend goed. Deze aspecten hebben allemaal invloed op het marktaandeel van een ontwikkelaar. Als we bijvoorbeeld een grondverwervings- en verkoopstrategie nemen: hoe meer grondreserves een ontwikkelaar heeft, hoe meer producten een ontwikkelaar op de markt kan leveren.

Maatschappelijk verantwoord ondernemen:
Maatschappelijk Verantwoord Ondernemen is een vorm van zelfregulering door bedrijven die is geïntegreerd of gebruikt wordt in een bedrijfsmodel. Het doel van MVO is om verantwoordelijkheid te integreren in de activiteiten van het bedrijf en een positieve impact op het milieu, de gemeenschap, de consument, de werknemers en alle belanghebbenden aan te moedigen. MVO is niet alleen een zelfregulerende factor van een bedrijf, het is ook een effectieve methode om het publieke imago van het bedrijf te verbeteren, het ethische risico te verkleinen en de merkbekendheid te vergroten.

Regionale concurrentie:
Regionale concurrentie is een van de indicatoren omdat het kan meten hoe competitief een bedrijf is in een bepaalde regio. Bijvoorbeeld, wanneer een bedrijf zeer competitief is in een ontwikkelde regio (bijv. Amsterdam, Rotterdam, Utrecht, Den Haag) dan is het een goeie weerspiegeling dat een bedrijf competitief is omdat het concurreert in een markt met meer competitie.

Appendix B – Survey results

respondent #	Sustainability measures are too costly	No access to financing	Lack of suitable business cases	Risks perception	Split-incentive	Short term view / involvement	Regulations	Lack of flexibility by law and regulations	Lack of ambition / vision for sustainability	Protest / objections from actors	Lack of knowledge, awareness or expertise	Insufficient support for research, learning and pilot projects	Insufficient transfer of knowledge	Lack of knowledge concerning BREEAM	Lack of coordination within and between different organizational level	Sectoral responsibility versus collective interest	Lack of leadership capacity and know-how for complex, cross-sectoral process	Lack of courage	Lack of support / direction	Sustainability measure was not considered by stakeholders	sustainable measure (in some cases it was the responsibility of client or the contractor)	Sustainability measure was not required by client	Sustainable measure was restricted, or not allowed, by regulators	the development process to implement sustainability measure	Risks involved because of different contract forms of project delivery and changed site practices and behaviors	Interest conflicts between various stakeholders in using green measures	Site conditions mitigated against the use of a sustainable measure	Inadequate, untested or unreliable sustainable materials, products or systems	Sustainable measure was not available	Technical difficulty during the construction process	5 stages and emerging drivers	management competency	organizing competency	technological capabilities	financial competency	market share	social responsibility	regional competitiveness
1	2	1	-1	2	1	1	2	-1	2	0	1	1	0	1	1	1	1	1	0	1	-1	-1	0	0	0	1	0	-1	-1	1	2	4	4	2	5	4	4	4
2	-1	1	-2	2	-1	2	-1	1	-2	1	-1	1	0	-2	0	0	0	1	-1	0	-1	1	-1	-1	0	0	0	0	-2	-1	-1	2	5	4	4	5	2	3	1
3	1	-1	0	0	-1	1	-1	-1	2	-1	-1	1	1	0	1	2	0	0	1	0	-1	-1	0	-1	-1	0	-1	0	-1	-1	-1	2	4	4	3	4	2	2	3
4	1	0	0	0	1	-1	-1	0	0	0	-1	-1	0	0	-1	0	-1	-1	-1	-1	-1	0	-1	0	0	0	-1	-1	-1	1	2	2	3	3	4	2	3	3
5	2	1	-1	1	1	1	-1	1	-1	1	1	1	0	0	0	1	-1	1	-1	1	-1	0	-1	0	0	0	-1	-1	-1	1	2	4	4	3	5	4	4	4
6	0	0	0	0	0	1	2	0	1	1	0	1	0	1	1	1	1	2	1	1	0	1	0	1	0	1	0	0	-1	1	2	4	4	3	4	4	4	3
7	2	2	2	-1	-2	1	-2	2	-2	-2	-1	-1	-1	-2	-1	-2	1	0	-2	-2	-1	1	-2	0	-1	2	1	-2	-2	0	2	2	2	2	5	4	4	4
8	1	1	2	0	-1	-1	1	2	2	-1	1	-1	1	0	-1	1	-2	0	0	1	-1	1	-2	1	-2	-1	-1	-1	0	-1	2	5	3	3	4	4	4	3
9	2	1	-1	1	0	1	1	0	1	-1	1	1	0	0	1	1	0	1	1	0	-1	0	0	-1	0	1	-1	-1	-1	0	2	4	4	2	5	4	4	4
10	2	2	2	0	1	-1	0	1	0	1	1	1	1	1	0	1	1	1	0	1	0	1	1	-1	1	1	0	0	0	1	2	2	2	4	4	4	4	4
11	2	1	-1	2	0	-2	-2	-2	-2	0	-1	-1	-1	1	0	-2	-2	-2	0	2	-2	-2	-2	-2	0	1	1	0	-1	0	2	4	2	2	4	4	2	4
12	2	1	-1	1	1	1	1	1	1	-1	1	0	0	0	0	1	0	1	0	1	-1	1	-1	-1	0	1	-1	-1	-1	-1	3	4	4	2	5	5	4	4
13	1	0	-1	2	1	1	1	0	-1	1	-1	0	0	1	1	1	0	1	-1	1	-1	1	0	0	0	1	-2	-2	-2	-1	2	4	4	3	4	4	3	3
14	1	0	-2	2	1	-1	1	-1	0	-1	-1	0	-1	1	1	1	2	0	1	-2	1	-1	1	0	1	-1	0	-1	-1	-1	2	5	4	2	5	4	4	3
15	1	0	-1	2	0	1	1	1	0	1	1	0	0	1	0	0	-1	1	-1	1	-1	0	-1	0	0	1	-1	-1	-1	-1	3	4	4	4	4	4	4	4
16	2	1	-2	1	1	1	-1	0	1	-1	-1	-1	0	1	-1	1	-1	1	-1	1	-1	-1	0	-1	1	1	-2	-1	-1	-1	2	4	3	2	4	4	4	4
17	1	0	-1	1	0	-1	1	0	0	1	1	0	0	-1	0	1	-1	1	0	1	-1	1	-1	-1	0	1	-1	-1	-1	-1	2	4	4	3	5	4	4	4
18	2	0	-1	2	1	1	0	-1	-1	-1	0	1	0	1	-1	1	0	1	-1	1	-1	0	1	0	0	1	-1	-1	-1	-1	3	4	4	3	5	4	3	3
19	2	0	-1	1	1	1	0	0	0	0	1	0	0	0	0	1	-1	2	-1	1	-1	-1	0	-1	0	0	-1	-1	-1	-1	2	5	4	3	5	4	2	4
20	1	0	-2	0	1	-1	1	0	0	0	1	-1	0	-1	0	1	-1	1	-1	0	-1	-1	-1	-1	0	1	-1	-1	-1	-1	2	5	3	4	4	4	4	4
21	2	-1	-2	1	0	0	0	-1	-1	-1	1	1	0	0	0	1	0	2	-1	1	-2	-1	-1	-1	0	0	-1	-1	-2	-1	2	4	4	4	5	5	3	3
22	2	1	0	2	1	1	1	2	0	1	0	0	1	0	1	0	2	0	0	0	2	1	1	1	-1	1	0	0	0	1	2	5	3	2	4	4	3	3
23	1	1	1	1	-1	1	-1	1	-1	1	-1	-1	0	-1	-1	1	0	0	-1	1	-1	1	0	0	0	1	0	-1	-1	1	2	5	5	2	3	2	3	2
24	2	-1	-1	2	1	-1	0	1	0	1	1	1	-1	1	0	2	0	1	-1	1	-1	1	-1	-1	-1	1	-2	-2	-2	-1	2	4	4	4	5	3	3	3
25	2	-1	0	1	0	1	1	0	0	1	-1	0	0	1	-1	1	-1	1	-1	-1	-2	-1	-1	0	0	1	-1	-1	-1	-1	3	4	3	4	5	4	3	2
26	2	0	-2	0	1	1	0	0	-1	-1	1	0	0	0	1	1	-1	1	-1	1	-2	1	-1	0	0	-1	-2	-1	-2	-1	2	3	4	3	4	4	4	3
27	2	-1	-2	2	0	1	0	0	1	-1	0	0	0	1	0	1	-1	1	-1	0	-1	-1	-1	0	0	1	-2	-1	-2	-1	2	4	3	3	5	4	3	4
28	1	0	-2	1	0	0	1	-1	0	0	1	0	0	0	0	1	0	1	0	0	-1	0	-1	0	0	1	-1	0	-2	-1	2	4	3	4	4	4	4	2
29	-1	0	0	1	-1	-1	2	2	-1	-1	1	-1	0	0	2	1	2	1	1	-1	-1	-1	-1	-1	-1	1	1	-1	-1	-1	2	4	4	3	4	1	2	2
30	1	0	0	1	-1	0	-1	0	1	-1	1	1	0	0	2	0	0	1	0	1	-1	1	-1	0	-1	0	-1	-1	-1	1	2	3	3	2	3	3	3	4
31	1	0	0	1	-1	0	-1	0	1	-1	1	1	0	0	2	0	0	1	0	1	-1	1	-1	0	-1	0	-1	-1	-1	1	2	3	3	2	3	3	3	4
	1,35	**0,29**	**-0,65**	**1,03**	**0,16**	**0,29**	**0,16**	**0,23**	**0**	**-0,13**	**0,23**	**0,13**	**0**	**0,16**	**0,23**	**0,68**	**-0,16**	**0,81**	**-0,42**	**0,52**	**-1**	**0,13**	**-0,65**	**-0,32**	**-0,23**	**0,65**	**-0,77**	**-0,9**	**-1,13**	**-0,32**	**2,13**	**3,94**	**3,52**	**2,9**	**4,35**	**3,61**	**3,35**	**3,29**

Appendix C – Interview results

Respondent 1:

Vraag 1: Is duurzaamheid onderdeel van jullie bedrijfsstrategie? Zo ja Hoe?

Jazeker, we hebben een boekje waarin duidelijk wordt uitgelegd op welke manieren we hier allemaal aan voldoen. ESG doelstellingen staan centraal in de bedrijfsstrategie en in het overview staan enkele dingen opgenomen waar het bedrijf zich specifiek op focust. Bijvoorbeeld; niet alleen maar duurzame producten maar het gaat zelfs zo ver dat we ons bezig willen houden met bedrijven die zich focussen op innovatie (wedrivesolar, etc.), maar ook zien we dat klanten bijvoorbeeld vragen naar houtbouw, dan gaan we specifiek opzoek naar bedrijven die werken met houtbouw. Daarnaast kijken we ook heel erg naar klant tevredenheid. Zo zijn wij niet alleen bezig vanuit een maatsfchappelijk belang maar ook vanuit de klant en zien we dat zij tevreden zijn op het moment dat wij werken vanuit een duurzame instelling. We proberen natuurlijk op zoveel mogelijk vlakken het uiterste te halen maar dit lukt niet altijd, toch blijven we hieraan werken.

Het gaat over een positieve impact op de samenleving, klimaatverandering, ambitie om bekend te staan als stadspartner, hoe kunnen we de leefbaarheid verbeteren, hoe kunnen we meer mensen met elkaar in verbinding brengen, hoe kunnen we sociale veiligheid garanderen, hoe kunnen we de leefbaarheidsscores in bepaalde wijken verhogen, beste werkgever (co2 uitstoot, werknemer tevredenheid), aantrekkelijk en duurzaam vastgoed, huurderstevredenheid, duurzame acquisitie, slimme woningen, GRESB scores zo goed mogelijk scoren. Centraal staat: hoe kunnen we het geld wat we krijgen van de pensioenfondsen zo goed mogelijk inzetten om zowel een maatschappelijk als financieel rendement te behalen.

Vraag 2: Hebben deze acties een positief gevolg voor jullie competitieve voordeel?

Ja, ons idee is dat de duurzame acties dit zeker kunnen opleveren. Wij zien wel dat het belangrijk is voor de maatschappij en dat we onze fondsen maatschappelijk willen investeren, maar je ziet gewoon dat we dit nog verder willen uitrollen omdat we zien dat het een effect heeft, niet alleen voor de samenleving maar ook voor de klanten, en kansen op nieuwe klanten, omdat je een heel goed verhaal hebt omdat je er al mee bezig bent. Dus ik denk zeker dat we ons op deze manier hiervoor inzetten en het begint zich in de afgelopen periode heel goed te vertalen in klant tevredenheid maar ook in medewerkers tevredenheid. Uiteindelijk is het ons doel om de mensen die in onze projecten wonen en verblijven dat je het daar ook terug gaat zien.

Je ziet eigenlijk dat op verschillende vlakken dat mensen het waarderen dat duurzaamheid onderdeel is van de projecten. Ik denk dat dit wel voordeel heeft en dat we dit nog veel meer mogen gaan uitdragen. Dit komt omdat je vaak als belegger vaak als we groot, logger en ambtelijke wordt gezien, maar er zit ook best wel veel slagkracht en ambitie achter. Het beleggen met betekenis willen we ook echt graag zien dat het meer aandacht krijgt om te zien hoe mensen naar ons bedrijf kijken maar ook hoe mensen naar onze klanten kijken.

Vraag 3: Denkt u dat er hier nog SDA's en / of acties ontbreken die NL ontwikkelaars ter beschikking hebben?

SDA's	Acties toegevoegd
Green product development	GRESB scores (meer vanuit de belegger) Maatschappelijk 'positief' effect
Green supply chain management	Werken met innovatieve partners
Green human resource management	
Green profiling and marketing strategy	
Green facility management	Duurzame huisvesting

Vraag 4: Wat is de impact van de SDA's op de KCI's?

what is de impact van de SDA's op de KCI's	competitieve indicatoren Nederlandse Ontwikkelaars (KCI's)						
duurzaamheidsmaatregelen ter om te komen tot een duurzame bedrijfsstrategie (SDA's)	management competentie	organisatie competentie	technologische capaciteiten	Financiele competentie	markt aandeel	maatschappelijk verantwoord ondernemen	regionale concurrenie	
Green product development	4	4	3	5	4	5	4	29
Green Supply Chain Management	3	4	5	4	3	4	3	26
Green Human Resource Management	4	4	3	3	1	2	1	18
Green profiling and marketing strategy	3	3	2	4	4	4	3	23
Green facility management (intern / extern)	5	4	3	3	2	3	2	22

Antwoord mogelijkheden = geen impact (leeg), zeer lage impact (1), lage impact (2), gemiddelde impact (3), hoge impact (4), zeer hoge impact (5)

Vraag 5: is er behoefte aan inzicht in welke duurzaamheidsmaatregelen bijdrage leveren aan het competitieve voordeel van uw bedrijf? Zo ja biedt deze tool inzicht en kan het helpen met prioriteren?

Ja, dit model kan helpen met prioriteit stellen. Maar van een onderzoek volgt natuurlijk een vervolg onderzoek. Het kan van toegevoegde waarde zijn ook omdat een bedrijf kan kijken van waar leg ik de focus op omdat dat onderdeel voor dat bedrijf van belang is (omdat hier in de hele keten het meeste effect mee in beweging is te brengen). Het kan vooral inzicht geven in waar zit je in de keten en waar wil je invloed op uitoefenen.

Respondent 2:

Vraag 1: Is duurzaamheid onderdeel van jullie bedrijfsstrategie? Zo ja Hoe?

Allereerst vind ik het heel belangrijk dat het intrinsiek is in plaats van dat het competitief is. Wanneer je niet intrinsiek bent gemotiveerd maar alleen ergens een label op plakt dan werkt het ook niet. Duurzaamheid is de basis van een groot deel van de bedrijfsvoering. We zijn B-corp om mee te beginnen. B-corp is een Amerikaans certificeringslabel wat menig bekend bedrijf mee gecertificeerd is. Eigenlijk conformeer jezelf ermee dat je je bedrijfsvoering doet a.d.h.v. people, planet, profit. Om een voorbeeld te geven: het gaat echt om integrale bedrijfsvoering. Bijvoorbeeld mannen en vrouwen moeten hetzelfde betaald krijgen, op kantoor je afval scheiden, in je projecten aantonen dat de projectvorming is gedaan in samenwerking met de buurt, dat je hebt nagedacht over waar er behoefte naar is in die buurt, vermogen weghalen bij duurzame banken, certificering van bepaald niveau, hele reeks met dingen (van klein tot groot). We zijn op dit moment de enige B-corp ontwikkelaar in Nederland. Het is een goed sturing middel om te checken of je nog steeds zo duurzaam bent als dat je was toen je was gestart, hoe groter je wordt is het makkelijk om steeds meer in het traditionele spectrum te eindigen.

Hoe wij nu onze bedrijfsvoering doen: als we een nieuwe locatie zoeken om een nieuw project te starten dan kijken we eigenlijk vanuit onze 4 impact pijlers. Deze pijlers zijn economical, public, ecological, en personal. Dat zijn eigenlijk 4 thema's om zo'n plek te onderzoeken. Bijvoorbeeld binnen ecological wordt er gekeken naar wat er al op een locatie is en kijken of het mogelijk is om aan te sluiten bij ecological structuren, wat je kan doen met circulariteit, materiaal keuzes. Bijvoorbeeld economical, wat voor een wijk is het? Wat speelt daar? Hoe kan je hieraan bijdragen? Bijvoorbeeld public: wie wonen daar? Waar is er behoefte aan? Hoe kunnen we deze plek aantrekkelijker maken? Kunnen we voorzieningen toevoegen die nodig zijn in dit gebied? Bijvoorbeeld personal: gaat heel erg over hoe ervaart een mens een gebouw? Prettiger, veiliger, iconisch, esthetiek, etc. Met die pijlers starten een project, dit wordt gedaan door eigen onderzoek maar ook door mensen in te huren die niks te maken hebben met vastgoed. We merken dat dit heel erg leuk is omdat je een plan krijgt wat niks te maken heeft met vastgoed denken, terwijl je toch best snel een idee krijgt van het programma, de architectuurstijl, etc. Op deze manier staat er al iets wat is gestuurd uit de 4 pijlers, daarna wordt er gerekend op meer de traditionele wijze. Op deze manier merk je dat je je vraag naar de gemeente al helemaal hebt en een goed verhaal omdat het ook makkelijk is te begrijpen waar het allemaal vandaan komt, en dat is niet allemaal vanuit een excel sheet. Na dit proces gaat het steeds meer richting de traditionele projectmanagement en projectontwikkelingen stappen. Maar ook in die stappen reflecteren we heel erg terug op die pijlers en proberen we steeds verder te professionaliseren dat het ook in de contract stukken staat zodat je het ook daadwerkelijk kan waarmaken.

Vraag 2: Hebben deze acties een positief gevolg voor jullie competitieve voordeel?

Ja ik denk dat het zeker zo is, maar misschien niet direct vanuit de hoeken vanuit waar je het zou verwachten. Beleggers zijn er steeds meer in geïnteresseerd, sommige ook niet bepaald, en andere willen weer graag een certificering maar maken het grootte verhaal eromheen niet zoveel uit. Maar doordat wij deze bedrijfsvoering hebben trekken wij makkelijker mensen aan die ermee bezig zijn, en ook een hele erge motivatie hebben om dit te verbeteren. Dus het is een hele goede manier om je personeel te verwerven. Hier zit ook veel kracht in, als je goede mensen kan vinden. Het helpt heel erg om bij de gemeente om je plannen op te gaan volgen, of bestemmingsplan wijzigingen, dit is ons werkveld erg belangrijk want je doet het altijd van scratch dus je moet altijd langs die gemeente. Daarnaast vinden partijen het vaak leuk om met je te werken, ook de niet traditionele

economische bedrijven binnen het vastgoed, dus bijvoorbeeld gemeenten die tegen andere bedrijven zeggen; “he ga eens met [redacted] (weggelaten i.v.m. privacy) werken want die benaderen dit wel leuk” of een aandeelhouder waar je eerder mee hebt gewerkt die je uitnodigen om mee te werken aan nog een project. Los daarvan, als het proces met de gemeente wat soepeler gaat is dat meteen een voordeel. Er zijn zeker beleggers en gebruikers die graag op deze manier samenwerken.

Vraag 3: Denkt u dat er hier nog SDA’s en / of acties ontbreken die NL ontwikkelaars ter beschikking hebben?

SDA’s	Acties toegevoegd
Green product development	Biophilic, klimaatadaptie, SMART grid (elektra van een wijk op een batterij), Bronnet, Data center warmte voorziening
Green supply chain management	Uitsluiten van partners
Green human resource management	Gezondheid van het personeel
Green profiling and marketing strategy	B-corp
Green facility management	

Vraag 4: Wat is de impact van de SDA’s op de KCI’s?

what is de impact van de SDA's op de KCI's		competitieve indicatoren Nederlandse Ontwikkelaars							
		management competentie	organisatie competentie	technologische capaciteiten	Financiele competentie	markt aandeel	maatschappelijk verantwoord ondernemen	regionale concurrenie	
duurzaamheidsmaatregelen ter om te komen tot een duurzame bedrijfsstrategie	Green product development	4	4	3	2	4	4	4	25
	Green Supply Chain Management	2	2	3	1	2	3	1	14
	Green Human Resource Management	4	4	1	1	4	5	3	22
	Green profiling and marketing strategy	4	3	4	2	3	4	4	24
	Green facility management (intern / extern)	2	2	3	4	3	3	1	18

Antwoord mogelijkheden = geen impact (leeg), zeer lage impact (1), lage impact (2), gemiddelde impact (3), hoge impact (4), zeer hoge impact (5)

Vraag 5: is er behoefte aan inzicht in welke duurzaamheidsmaatregelen bijdrage leveren aan het competitieve voordeel van uw bedrijf? Zo ja biedt deze tool inzicht en kan het helpen met prioriteren?

Jazeker, echter de blokjes in de matrix zijn nog redelijk algemeen. Een gedetailleerde toelichting van elk van de actions zou hier meer bij helpen. Toch heeft de algemene boodschap ook wel voordelen.

Respondent 3:

Vraag 1: Is duurzaamheid onderdeel van jullie bedrijfsstrategie? Zo ja Hoe?

Het is eigenlijk vanaf de oprichting al onderdeel van de bedrijfsstrategie. Binnen duurzaamheid heb je natuurlijk allerlei vormen. Niet in de zin dat we alle lijstjes aftikken die verbonden zijn met duurzaamheid zoals gemeenten doen, maar we zijn eigenlijk ooit begonnen met het idee dat gebouwen flexibel aanpasbaar in de tijd moeten zijn. Dat dingen zich door kunnen ontwikkelen in de loop des jaren, of een nieuwe invulling kunnen krijgen. Zo bekijken we niet alleen bestaande bouw maar ook nieuwe gebouwen. Zo worden er vaak conceptuele studies gedaan naar gebouwen die heel gemakkelijk zijn te veranderen van bijvoorbeeld kantoren naar woningen zonder daar heel veel moeite in te steken. Dit wordt gedaan door onder anderen het voorbereiden van verdiepingshoogtes, schachten etc., dus als je dit van te voren goed meeneemt dan maak je gebouwen die mee groeien met de stad zonder daar heel veel centjes en grondstoffen te in hoeven steken. Het flexibel aanpasbaar bouwen is vanaf het begin een heel belangrijk aandeel. Binnen een functie kunnen gebouwen ook flexibel zitten. Dit soort denken zit bij ons in het DNA.

Later kwamen ook dingen als de EPC eisen, dit vinden wij eigenlijk wel redelijk een verplicht wensen lijstje. Hier zijn wij eigenlijk niet zo'n voorstander van. We vinden eigenlijk dat je gewoon per plek moet denken, vanuit de plek kijken wat een logische ingreep is, wat is een logisch concept, wat is een logische markt die kunt bedienen, etc. Zo moet je ook naar duurzaamheidsoplossingen moeten kijken.

We hebben ons een keer laten verleiden door mee te doen aan een prijsvraag van de gemeente Amsterdam voor een woontoren in 2012 met een EPC van 0. Dit was een gebouw met een zonnepanelen gevel, dit was nodig om een EPC van 0 te halen. Daarnaast moet je raampjes heel klein gaan maken, wat leidde tot geen duurzame oplossing. We hebben de handschoen opgepakt om eens te laten zien wat er kan echter is dit architectonisch niet het meest fraaie gebouw. Dan woon je op 70m en heb je niet een mooi riant uitzicht. Dus de vraag is dan is dit duurzame kwaliteit of niet? Ga je die gevel na een paar jaar weer vervangen? De hoge esthetische impact van verticale zonnepanelen weegt niet perse af tegen het lage rendement van dezelfde panelen. Vanuit de lijstjes ontkom je er eigenlijk niet aan. We zijn altijd heel kritisch bij gemeenten om te voorkomen dat ze niet copy/paste met hun wensenlijstje doen op elke locatie. Wees kritisch op waar je het hoogte rendement kan halen en wat zinvol is.

Tussentijdse vraag: naast de productmatige duurzaamheidsmaatregelen, implementeren jullie ook procesmatige duurzaamheidsmaatregelen?

Wij zijn een kleine club die focussen op het juiste concept bedenken en daar ook heel consequent in door redeneren. Daar voeden we onszelf en iedereen binnen het bedrijf mee op. Dat pakken we op onze eigen manier een beetje eigenzinnig aan.

Met het project [redacted] (weggelaten i.v.m. privacy) hebben we gekeken hoe we een esthetisch hoog kwaliteit gebouw kunnen maken waar duurzaamheid zoveel mogelijk in mee was genomen. Tijdens de industriële revolutie is het houtbouw verloren gegaan en hiermee wouden we een statement maken.

Er is geen overkoepeld policy binnen het bedrijf waarin staat: dit is wat wij met duurzaamheid doen. Het is meer dat het per project wordt benaderd, kijken en innoveren waar mogelijk.

Vraag 2: Hebben deze acties een positief gevolg voor jullie competitieve voordeel?

Richting opdrachtgevers voor nieuwe projecten zeker, want we doen in het oog springende dingen. Onze concepten en nieuwe gedachtes spreken aan. Richting de eindgebruiker en consumenten en bedrijven die huren beperkt. Omdat het een ingewikkeld systeem is met de gescheiden exploitatie daarin. Het is moeilijk om daar doorheen te breken, dit proberen we op kleine schaal af en toe wel, maar daar zie je dat vaak vanuit de voorschriften van de gemeenten je ook al best wel belemmerd wordt in dingen. Daar begint het voor de ontwikkelaar al mee.

Het gaat vaak al mis bij de gemeente, die stellen enorme duurzaamheidseisen en zulke hoge grondprijzen waar geen rekening wordt gehouden met de voorinvestering. Dan zeggen ze dat je de zonnepanelen en de WKO ook kan outsourcen maar dan komt het rendement natuurlijk uiteindelijk terecht bij de exploitant en ook niet bij de bewoner. Het systeem van prikkels (stimulansen) gaat momenteel nog niet goed als je dit serieus wilt oppakken. Als je het serieus wilt oppakken zal je dit ook met z'n allen moeten erkennen en dan handelen want het kan natuurlijk wel.

De mogelijkheden zijn er wel.

Vraag 3: Denkt u dat er hier nog SDA's en / of acties ontbreken die NL ontwikkelaars ter beschikking hebben?

SDA's	Acties toegevoegd
Green product development	
Green supply chain management	
Green human resource management	
Green profiling and marketing strategy	Aanwakkeren van de maatschappelijk discussie
Green facility management	

Vraag 4: Wat is de impact van de SDA's op de KCI's?

what is de impact van de SDA's op de KCI's		competitieve indicatoren Nederlandse Ontwikkelaars						
		management competentie	organisatie competentie	technologische capaciteiten	Financiele competentie	markt aandeel	maatschappelijk verantwoord ondernemen	regionale concurrenie
duurzaamheidsmaatregelen ter om te komen tot een duurzame bedrijfsstrategie	Green product development	3	4	2	4	4	4	4
	Green Supply Chain Management	4	4	2	4	4	4	4
	Green Human Resource Management	3	3	2	3	3	3	3
	Green profiling and marketing strategy	3	4	2	4	4	4	4
	Green facility management (intern / extern)	3	4	2	3	3	3	3
		25	26	20	25	21		

Antwoord mogelijkheden = geen impact (leeg), zeer lage impact (1), lage impact (2), gemiddelde impact (3), hoge impact (4), zeer hoge impact (5)

Vraag 5: is er behoefte aan inzicht in welke duurzaamheidsmaatregelen bijdrage leveren aan het competitieve voordeel van uw bedrijf? Zo ja biedt deze tool inzicht en kan het helpen met prioriteren?

Ik denk op zich dat het wel goed zou zijn als bedrijven daar inzicht op hebben, wat denk ik het belangrijkst is, is dat je er bewust van bent. Dat je er bewust bij stil staat. Bijvoorbeeld 'ik doe

duurzaamheid omdat ik er commercieel beter van wordt of omdat ik het moet vanuit de regeltjes.' Maar ergens is het ook wel belangrijk dat je het gewoon doorleeft en snapt hoe je organisatie daarop ingericht moet zijn. Wij geloven heel erg dat je van onderop die innovatie moet stuwen, maar we zijn ons wel bewust van noodzaak zowel intrinsiek en nut met daarbij de commerciële afdeling die een rol speelt. Wij zoeken ook wel de mensen die bij ons werken die maatschappelijk bewust zijn hebben, die wat verder kijken. Je bent zelf eigenlijk een heel consequent product. Misschien is het goed om zo'n spiegel voorgehouden te krijgen omdat het toch wel een beetje bedrijfscultuur verandering moet realiseren. Het bewust zijn van en het gesprek aan gaan helpt wel bij de cultuur verandering.

Respondent 4:

Vraag 1: Is duurzaamheid onderdeel van jullie bedrijfsstrategie? Zo ja Hoe?

Dit pakken we eigenlijk op twee manieren aan. Wij zijn eigenlijk alleen maar een ontwikkelaar en we zijn geen belegger. Dat betekent dat wij ons ontzettend richten op de markt en de marktvraag. Dus wij zijn daarin zo vrij dat wij allerlei duurzaamheidslabels en regimes kunnen implementeren in onze projecten. Dit betekend dat als je met bepaalde beleggers samenwerkt kan het zijn dat je gebruik maakt van LEED, andere willen graag een BREEAM label, en je hebt ook nog verschillende gemeenten en andere autoriteiten die allemaal hun eigen duurzaamheidsmaatregelen hebben (agenda duurzaamheid Amsterdam, agenda duurzaamheid Rotterdam, etc.). Er zijn hier veel verschillen in, in sommige plekken zijn er andere energie eisen, gpr eisen, of dat soort zaken. Dit betekent dat je op elk project lean en mean moet inspelen en wij moeten zorgen dat we wel al die labels kunnen handelen en het tweede is, waar we een tijdje geleden mee zijn gestart, noemen we [redacted] (weggelaten i.v.m. privacy). Hier proberen we zelf ook een pad te creëren met de vraag, hoe kunnen we nou innovatie en duurzaamheid toch vanuit onze eigen optiek verstal te gaan geven.

Tussentijdse vraag: kijken jullie ook naar procesmatige dingen die jullie kunnen doen (m.b.t. duurzaamheid)?

Ja inmiddels dus wel, BREEAM vinden we inmiddels als breder dan product, het is ook locatie gebonden. Het zijn wel onderdelen waar we heel vaak merken dat operators, vaak bij hotels of mensen die een kantoor managen, daar eigenlijk helemaal niet meer op zitten te wachten na een tijdje. We gaan nu ook meer kijken naar het proces, hoe kunnen we dat nou slimmer en innovatief inrichten om niet alleen maar op het beton en het hout te blijven hangen.

Interesse naar [redacted] (weggelaten i.v.m. privacy)*, is dit opgericht nog altijd met de focus op vastgoed ontwikkelen of is het een aparte organisatie die echt gaat focussen op duurzaamheid?*

Nou we merken dat als we willen focussen op intrinsieke duurzaamheid dat het altijd wordt ondergesneeuwd in een project, want dan ben je altijd met andere dingen bezig. Daardoor hebben we nu eigenlijk er gewoon tijd voor gereserveerd, we merken namelijk dat dit gewoon nodig is om dit te doen. We gaan eventjes iemand er echt losse aandacht aan geven want anders gebeurd het niet, je bent dan teveel bezig met de probleem oplossing van alle dag. Dus er wordt nu gekeken vanuit duurzaamheid en innovatie, hoe we processen beter kunnen inrichten en aan de lijf kunnen ondervinden hoe we duurzaamheid zouden willen implementeren, dit moeten wij ook nog een beetje ontdekken. Wat wij doen aan BREEAM, is dat wel zo duurzaam of vind je dat wel duurzaam? Hoe sta je hier als bedrijf in?

Vraag 2: Hebben deze acties een positief gevolg voor jullie competitieve voordeel?

Daar zijn we nu wel mee bezig, we proberen ons wel bij elk project ook af te vragen voor wie doen wij nou dit? Dus als wij een ontzettend duurzaam onderdeel in het gebouw maken doen wij dat omdat de gemeente dat wil of wil de belegger dat, of wil [redacted] (weggelaten i.v.m. privacy) dat graag? Dat is een beetje de zoektocht naar hoe we dat kunnen ontrafelen. Ik denk dat dat ook wel een hele belangrijke is hoe je dat in je marketing naar buiten brengt.

Wie zit waarop te wachten? WKO installaties zijn natuurlijk harstikke duurzaam en we hebben een hele lange tijd ook wel bedrijven gehad die zeiden ‘dat wil ik eigenlijk helemaal niet’. Daarom vragen we vaak aan beleggers “wat vinden jullie nou de belangrijke duurzaamheidsaspecten die we in het ontwerp moeten gaan meenemen?” Eigenlijk kwam hierop niet meer terug dan gasloos en grote ramen. Grote ramen is eigenlijk helemaal niet duurzaam maar dat vinden ze dan belangrijk. En als

derde komt er dan bij misschien nog BREEAM voor het kantoordeel. Daar weten beleggers toch ook al niet vaak wat ze daarmee aan moeten of wat het nou precies is. En gasloos bouwen is inmiddels helemaal geen duurzaamheidsitem meer want je kan bijna geen gas meer krijgen. Dit laat zien dat een groot deel van de beleggingsmarkt er wat ons betreft best in achter loopt.

We merken wel dat hotels de behoefte hebben om duurzaam te zijn. Dus we hebben even een testje gedaan met onderanderen [redacted] (weggelaten i.v.m. privacy)en nog een paar werken. [redacted] (weggelaten i.v.m. privacy) weten we dat ze heel graag duurzaam willen zijn. En ik geloof dat in ruim 10 hotels waar we hebben gekeken dat er maar 2 zijn die duurzaamheid op hun site hebben staan. Dus als je als hotelgast boekt dat je kan zien dat je duurzaam bent. Dat was een gewaarwording voor [redacted] (weggelaten i.v.m. privacy), die hadden het helemaal niet door, maar het ging eigenlijk over de basale vraag van: is er iemand die er iets extra's voor over heeft of in prijs of in iets anders, om duurzaamheid te honoreren. Simpel weg is het meestal duurder, wie wil er graag extra voor betalen? Doet de ontwikkelaar dat die er bijna niets voor terug krijgt, of doet de belleger dat of door de woningzoeker (etc.)? Voor wie is het in de keten nou eigenlijk het meest belangrijk? Wij konden daar nou niet een heel eenduidig antwoord op vinden. Dus eigenlijk omgekeerd ook vragen we ons ook altijd af, of en hoe moeten we duurzaamheid aanbieden om bijvoorbeeld meer competitief te zijn?

Vraag 3: Denkt u dat er hier nog SDA's en / of acties ontbreken die NL ontwikkelaars ter beschikking hebben?

SDA's	Acties toegevoegd
Green product development	
Green supply chain management	Duurzaam financieren
Green human resource management	
Green profiling and marketing strategy	Duurzaamheidsimpact marketen
Green facility management	

Vraag 4: Wat is de impact van de SDA's op de KCI's?

what is de impact van de SDA's op de KCI's		competitieve indicatoren Nederlandse Ontwikkelaars							
		management competentie	organisatie competentie	technologische capaciteiten	Financiele competentie	markt aandeel	maatschappelijk verantwoord ondernemen	regionale concurrenie	
duurzaamheidsmaatregelen ter om te komen tot een duurzame bedrijfsstrategie	Green product development	3	4	4	4	3	4	3	25
	Green Supply Chain Management	4	4	3	4	4	3	4	26
	Green Human Resource Management	4	4	4	4	4	4	4	28
	Green profiling and marketing strategy	3	3	3	4	4	4	3	24
	Green facility management (intern / extern)	3	3	4	3	3	3	3	22

Vraag 5: is er behoefte aan inzicht in welke duurzaamheidsmaatregelen bijdrage leveren aan het competitieve voordeel van uw bedrijf? Zo ja biedt deze tool inzicht en kan het helpen met prioriteren?

Het is extreem relevant, het bestaat niet dat iemand zal zeggen dat het niet zo is. Vraag en aanbod komt in de vastgoed wereld op een hele vreemde manier bij elkaar. Iedereen zegt altijd het gaat om locatie, locatie, locatie en als je bijvoorbeeld kijkt wat is een van de grootste uitgaven die we in ons leven doen; dat is een huis. Hoe kiezen wij een huis?

De transparante vraag naar product kenmerk en product is er eigenlijk niet in de vastgoed wereld. Er moet een bewustzijn komen waar je denkt als bedrijf; waar kan ik me nou in onderscheiden. Want je moet het een soort van over profileren op een of andere manier. Heel veel projecten waarbij je je gaat profileren zijn tenders. Hierin zijn de regels omtrent duurzaamheid altijd strak omschreven en die regels zijn altijd anders. Bij elke tender zijn de regels weer anders, en het is altijd een combinatie. Bijvoorbeeld, we tellen duurzaamheid deze keer voor 10% mee, geld voor 80%, dit voor 5% en dit 5% en elke keer veranderen de regels. Dus het is wel bijzonder moeilijk om daar een strategie op te bouwen. Terwijl ik het wel super relevant vind, heel veel mensen die aan tenders mee doen hebben altijd het idee dat een loterij is, en hoe komt dat nou? Dat komt omdat het zo moeilijk is om jezelf te profileren op een onderdeel en dat zijn we ook niet helemaal gewend. Er zijn natuurlijk wel partijen die op duurzaamheid een streepje voor hebben of iets dergelijks. Maar er is momenteel nog niet een hele strakke lijn in te ontdekken.

Tussentijdse vraag: denk je dat dat er ook mee te maken heeft dat het in de vastgoed markt heel lastig is om generalisaties te maken omdat elk project uniek is en elk bedrijf is ook uniek en dat het daarom misschien ook moeilijk is?

Ja exact, in ieder geval de Nederlandse vastgoed wereld, vind het super leuk om bij elk vastgoed project alles opnieuw uit te vinden. Er zijn weinig standaarden, alles moet uniek, de hele keten ga hier ook in mee. Het is in principe niet de bedoeling dat je iets herhaalt. We zijn nu wel bezig om systemen en technologie van het ene naar het andere project te halen, maar toch, wordt er op een hoop onderdelen niet herhaalt. We hebben nu nieuwe duurzaamheidsregelingen. Hierdoor moet je weer een hoop zaken opnieuw gaan beschouwen van wat is nou eigenlijk de beste manier? Best wel vaak gooien de lokale regels ook weer roet in het eten. In sommige gevallen moet je stadsverwarming gebruiken in andere projecten mag je niet zonnepanelen gebruiken, het is echt moeilijk om een consistent aanvalsplan hiervoor te bedenken. Ik denk dat [redacted] (weggelaten i.v.m. privacy) inmiddels wel heel erg goed is om dit in de kantoorpanden te doen, dat hebben ze heel erg goed controle.

Respondent 5:

Vraag 1: Is duurzaamheid onderdeel van jullie bedrijfsstrategie? Zo ja Hoe?

Nou heel kort en bondig, in principe niet. Eigenlijk voldoen we vooral aan wet en regelgeving maar het heeft voor ons nog geen waarde om heel duurzaam te zijn. Het is allemaal eigen financiering, eigen projecten, eigen exploitatie en in eigen beheer. Dus duurzaamheid is bij ons meer een product wat lang mee gaat. De duurzaamheidsambitie die mensen hebben zoals energie neutraal en dat soort dingen zit er bij ons nog niet helemaal in.

Tussentijdse opmerking: het is misschien wel belangrijk om te melden dat duurzaamheid een onwijs container begrip is. Zo wordt het kopen van een wasmachine van Miele ook als duurzaam gezien omdat je jarenlang geen nieuwe wasmachine hoeft te kopen.

In die zin is duurzaamheid bij ons lange levensduur.

Tussentijdsevraag: Levensduur is heel erg op het product gefocust, denken jullie ook wel eens aan procesmatige dingen? Bijv. met een ander bedrijf samenwerken die een focus heeft op duurzaamheid.

Als dat bij ons naar voren zou komen zou het meer een prikkel zijn naar de gemeente of naar een overheidsinstantie om iets voor elkaar te krijgen. Stel dat wij een grote supermarkt ergens willen hebben en een gemeente willen prikkelen om mee te gaan in ons plan, dan zouden wij kunnen zeggen we gaan de duurzaamste supermarkt bouwen. Maar dan is het niet in het belang van duurzaamheid maar in het belang dat de supermarkt er komt.

Duurzaamheid is zeker geen prioriteit. Zoals ik zei duurzaamheid in de vorm van levensduur heeft altijd prioriteit bij ons want wij houden de projecten zelf, dus de langer dat we er niks aan hoeven te doen, des te beter natuurlijk. Dus aan de voorkant houden we ons heel erg bezig met materialen en het werk, maar om te zeggen dat we ermee bezig zijn vanuit onszelf heeft is niet waar. Het heeft altijd een financiële reden.

Tussentijdsevraag: Wat houdt jullie dan tegen om het te gaan doen?

Wij hebben een heel laag energiecontract, we betalen [redacted] (weggelaten i.v.m. privacy) cent per kilowatt, dus als wij zonnepanelen plaatsen dan is dat voor ons niet duurzaam want dat kost geld. Dus bij ons zit er altijd een financieel belang aan of wij iets duurzaams willen. Als wij een casco winkel unit bouwen dan gaan we niet hele pand duurzaam maken want wij doen het casco en de winkel die de inbouw doet die mag van ons alles doen, maar wij houden ons gewoon aan de regels en voor de rest speelt het voor ons geen rol. Dus wij kunnen wel een heel duurzaam gebouw gaan ontwikkelen waar we heel veel onderhoud aan hebben met een groendak en zonnepanelen maar we hebben er niks aan. Bij ons is de huurinstroom belangrijk en dat moet goed benut zijn. Een betonnen casco is voor ons duurzamer dan een houtskeletbouw casco.

Wij ontwikkelen voor onszelf en wij financieren voor onszelf, en wij hebben zelf ook al onze posities dus wij hebben een heel ander standpunt dan bijvoorbeeld een ontwikkelaar die een tender moet winnen. Dan wordt het gewoon opgedragen vanuit de gemeente. Je kan een tender verliezen omdat je je niet duurzaam inschrijft, wij hebben de grondposities al, wij willen gewoon een gebouw neerzetten wat voor ons goed is. Duurzaamheid is voor ons wet en regelgeving en wanneer we willen prikkelen dan kunnen we duurzaamheid gebruiken.

Tussentijdsevraag: Ik heb natuurlijk heel veel onderzoek gedaan naar waarom een ontwikkelaar wel of niet duurzaam zou handelen. Daarin kwam ook uit omhoog dat juist wanneer je je panden in

beheer houdt de operationele kosten omlaag kan drukken de verhuurbaarheid verhogen dat je dan juist geprikkeld zou moeten zijn om duurzaam te gaan handelen.

Vraag 2: Hebben deze acties een positief gevolg voor jullie competitieve voordeel?

Voor supermarkten is het duurzaamheidsaspect wel heel erg belangrijk omdat hier de klanten direct in contact komen met het product. Maar bij onze woningen, mensen interesseert het niet echt of ze een duurzame woning hebben want als je tegenwoordig een woning bouwt dan is die al duurzaam. Je moet aan zoveel eisen voldoen, je moet al bijna energieneutraal zijn, dus voor onze markt qua woningen betekent dit dat de dingen die we bouwen zijn eigenlijk al duurzaam. Daar gaan we niet nog een extra stap in nemen want dan is eigenlijk de investering te groot.

Voor de hotels bijvoorbeeld, als jij een duurzaam hotel bouwt dan heb je wel een bepaald soort klant, dus dan speelt het ook een rol. Maar echt als vastgoedontwikkelaar voor ons, dan nee niet echt. Het is meer voor de gebruiker. Als er een gebruiker is die duurzaamheidsaspecten wil dan nemen we dat wel in de ontwikkeling mee maar dat komt meer vanuit de gebruiker. Wanneer wij een huurder willen, dan zorgen we dat het gebouwd wordt naar de wensen van die huurder.

Vraag 3: Denkt u dat er hier nog SDA's en / of acties ontbreken die NL ontwikkelaars ter beschikking hebben?

SDA's	Acties toegevoegd
Green product development	Levensduur verhogen
Green supply chain management	
Green human resource management	
Green profiling and marketing strategy	
Green facility management	

Vraag 4: Wat is de impact van de SDA's op de KCI's?

what is de impact van de SDA's op de KCI's		competitieve indicatoren Nederlandse Ontwikkelaars							
		management competentie	organisatie competentie	technologische capaciteiten	Financiele competentie	markt aandeel	maatschappelijk verantwoord ondernemen	regionale concurrenie	
duurzaamheidsmaatregelen ter om te komen tot een duurzame bedrijfsstrategie	Green product development	5	3	3	4	4	3	5	27
	Green Supply Chain Management	3	3	4	4	3	4	4	25
	Green Human Resource Management	4	3	2	3	3	3	3	21
	Green profiling and marketing strategy	4	3	2	3	3	2	4	21
	Green facility management (intern / extern)	4	3	2	3	3	4	3	22

Vraag 5: is er behoefte aan inzicht in welke duurzaamheidsmaatregelen bijdrage leveren aan het competitieve voordeel van uw bedrijf? Zo ja biedt deze tool inzicht en kan het helpen met prioriteren?

Ik denk dat ontwikkelaars best wel veel doen al met duurzaamheid, helemaal als je kijkt naar de kantoren markt en hoe de overheid er nu mee bezig is. Maar als je kijkt binnen organisaties dat je

daar eigenlijk ziet dat iedereen zegt dat de focus ligt op gebouwen maar eigenlijk op de interne organisatie bijna niet, ik denk dat daar nog best wel wat sturing in kan zitten. Die duurzame gebouwen die komen er wel, ik denk dat er intern binnen een organisatie nog wel veel kan veranderen in duurzaamheid.

Respondent 6:

Vraag 1: Is duurzaamheid onderdeel van jullie bedrijfsstrategie? Zo ja Hoe?

15 jaar geleden is [redacted] (weggelaten i.v.m. privacy) begonnen met vol inzetten op duurzaamheid in zijn algemeenheid om juist koploper en aanjager te zijn en om andere bedrijven met ons te inspireren om eindelijk hetzelfde te doen en ook wel stiekem om beter te kunnen concurreren met de markt. Wat altijd een beetje het probleem is duurzaamheid of bijvoorbeeld gezondheid is dat je wel kunt zeggen dat je heel duurzaam bent maar probeer het maar eens aan te tonen. Dus wat we eigenlijk doen is in elk project ambities te stellen qua BREEAM, LEED, of CO2 neutraliteit voor elk project en dan ervoor werken om die certificering te behalen. Om uiteindelijk gaat het om een heleboel investeerders, huurders en gemeentes erom dat je kan aantonen dat je aan een bepaalde kwaliteit behaald want zomaar roepen dat je iets doet betekent niet zoveel. Dus wat we eigenlijk hebben gedaan is een soort [redacted] (weggelaten i.v.m. privacy) gemaakt wat eigenlijk een dik boekwerk is waar onze gebouwen aan moeten voldoen en daarin staat gewoon de duurzaamheidsdoelstelling per project omschreven. Dat gaan we dan uiteindelijk zo uitvoeren en meestal leggen we dan ook met ontwerpteams vast waar we uiteindelijk aan moeten voldoen qua duurzaamheid en laten we hun bepaalde keuzes voorleggen voor ons. Bijvoorbeeld: gaan we in hout bouwen, gaan we heel erg inzetten op energie, gaan we heel erg inzetten op water.

Tussentijdsevraag: De onderwerp die je nu aankaart, zijn vooral product gefocust, zijn jullie ook met procesmatige dingen bezig met duurzaamheid?

We zitten in een hele boel werkgroepen internationaal en nationaal. Ze zijn nu bijvoorbeeld bezig met het implementeren van de ESG doelstellingen in het bedrijf. Ze kijken dus vooruit omdat hier uiteindelijk waarschijnlijk ook een certificering voor zal zijn. Ze kijken dus heel erg naar waar bevindt de markt zich, wat is in maatschappelijk gebied internationaal aan de hand, en dan kiezen we daar periodiek pikken we daar bepaalde onderdelen uit om telkens wel een beetje voor te blijven op de concurrentie.

Momenteel is dit dus ESG, dus we zijn nu heel bezig met diversity en gender equality, wat voor normale bedrijven heel erg vanzelf sprekend is dat het is geregeld maar voor vastgoedbedrijven lijkt dat nog ingewikkeld.

We zijn nu bijvoorbeeld ook in London actief daar is de markt eigenlijk al een stukje verder op het gebied van duurzaamheid dan in Nederland. Wat daar heel erg speelt is CO2 footprint, terwijl we in Nederland heel vaak terug gaan naar bepaalde certificering zoals BREEAM. Wat ze daar eigenlijk zeggen is gedurende de gehele life cycle van je project, dus ook tijdens de bouw en exploitatie, willen ze carbon neutral zijn. Dit is in Nederland nog niet echt een ding vandaar dat we de kennis die we in London opdoen nu ook graag naar Nederland willen brengen om weer hier net dat stapje voor te kunnen zijn.

Vraag 2: Hebben deze acties een positief gevolg voor jullie competitieve voordeel?

Voor ons zijn 3 partijen wel echt heel belangrijk die we moeten kunnen binnenhalen om ons project te willen realiseren. Dat zijn de gemeente, de belegger en de huurder. Al die partijen hebben allemaal hun eigen duurzaamheidsdoelstellingen. Door onze gebouwen een bepaalde kwaliteit mee te geven en bijvoorbeeld een belofte te doen richting de gemeente zoals 'wij maken het meest high-end kantoor gebouw voor jullie wat ook het meest duurzaam is in Eindhoven' Kom je gewoon het meest makkelijk aan tafel om een plot te mogen kopen, of om iets te herontwikkeling, of te mogen realiseren. Omdat je dan ook heel erg bijdraagt aan de doelstelling van bijvoorbeeld de gemeente wat die belangrijk vinden. En voor een huurder geld eigenlijk hetzelfde want een huurder heeft eigenlijk bedrijfsbrede ambities die eigenlijk te maken hebben met hun huisvesting, dus bijvoorbeeld co2 impact, dan is hij toch wel geneigd om snel te kiezen voor een gebouw wat energie zuinig is, wat op een goede locatie dicht bij een station, etc. omdat dit die partij makkelijker hun duurzaamheidsdoelen in hun bedrijfsstrategie laat realiseren.

Tussentijdsevraag: Dus je kunt eigenlijk beter antwoord geven op de vraag van de markt?

Ja eigenlijk wel. Ook al heb je twee identieke kantoor gebouwen, een van ons en een van de concurrent (huurprijs, esthetisch etc.). Die huurder is toch meer geneigd naar een duurzamer gebouw dan de andere optie. Door telkens net even iets in een kantoor of in iets anders te steken wat net even iets anders is dan die van de buurman, ben je zoveel aantrekkelijker als ontwikkelaar.

Tussentijdsevraag: Maar dat hoeft niet perse een duurzaamheidsaspect te zijn of wel?

Nee, daarom kiezen we nu ook vaak voor aspecten rondom gezondheid, door well being, groen, stimuleren van mobiliteit, of we zetten heel erg in op smart technology, dus data om je gebouw gebruiken te verbeteren. Dus duurzaamheid kan daar een onderdeel van zijn.

Vraag 3: Denkt u dat er hier nog SDA's en / of acties ontbreken die NL ontwikkelaars ter beschikking hebben?

SDA's	Acties toegevoegd
Green product development	ESG doelstellingen, toevoegen van groen aan publieke ruimte
Green supply chain management	Behouden van duurzame partnerships
Green human resource management	Aanhouden van personeel
Green profiling and marketing strategy	Kennis delen, voorbeeld functie
Green facility management	Smart data gebruiken om gebouw prestaties te verhogen.

Vraag 4: Wat is de impact van de SDA's op de KCI's?

what is de impact van de SDA's op de KCI's		competitieve indicatoren Nederlandse Ontwikkelaars							
		management competentie	organisatie competentie	technologische capaciteiten	Financiele competentie	markt aandeel	maatschappelijk verantwoord ondernemen	regionale concurrenie	
duurzaamheidsmaatregelen ter om te komen tot een duurzame bedrijfsstrategie	Green product development	2	1	5	5	5	3	5	26
	Green Supply Chain Management	3	1	4	3	3	4	3	21
	Green Human Resource Management	4	4	4	3	3	4	3	25
	Green profiling and marketing strategy	5	3	1	4	4	3	4	24
	Green facility management (intern / extern)	3	4	4	2	2	4	2	21

Vraag 5: is er behoefte aan inzicht in welke duurzaamheidsmaatregelen bijdrage leveren aan het competitieve voordeel van uw bedrijf? Zo ja biedt deze tool inzicht en kan het helpen met prioriteren?

Ja, ik zou zeggen in de boardrooms van verschillende bedrijven speelt dit topic denk ik best wel. Je merkt gewoon dat wij als ontwikkelaar, althans zo zie ik het binnen mijn bedrijf, dat we heel erg zijn in het ontwikkelen van projecten en heel erg goed zijn om inhoudelijk een project beet te pakken en de kwaliteit goed te maken. Maar als het dan echt gaat om waar ben je als bedrijf nou eigenlijk echt mee bezig? Op een hoger niveau, wie zijn we als bedrijf? Wat brengen we aan de wereld? En meer. Dat we dat gewoon minder beheersen van dat zit niet in de aard van het vak.

Omdat het op management niveau gebeurd is het heel handig om in strategische sessies, wat in elk bedrijf gebeurd, om te kunnen kijken we lopen heel erg achter in ons marktaandeel of het gaat niet heel goed met finance, waar moeten we ons dan op focussen in die andere aspecten? Dus ik denk dat het daar best wel waardevol voor kan zijn. Dus het niet een tool die je dag dagelijks gebruikt. Daarnaast zou het ook een goeie tool kunnen zijn voor strategische advies partijen.

Respondent 7

Vraag 1: Is duurzaamheid onderdeel van jullie bedrijfsstrategie? Zo ja Hoe?

Het is voor ons niet het aller belangrijkste en hoogste speerpunt wat we hebben en wat we altijd als basis gebruiken om een project heen te bouwen. Dat heeft natuurlijk er ook heel veel mee te maken dat we voor verschillende opdrachtgevers werken en dat bij sommige projecten het gewoon makkelijker implementeerbaar is dan bij andere. Voor ons is het wel een belangrijke basis en ik zou het wel iets meer als basis in het bedrijf willen hebben. Het feit dat jij er nu onderzoek naar doet, doet mij weer triggeren om er over na te denken of wij wel voldoende ermee bezig zijn en eraan doen en daarnaast wat we eraan doen of we dat wel voldoende communiceren. We vinden het namelijk normaal dat heel veel van die onderdelen gewoon in onze projecten zitten maar we dragen het eigenlijk zelden of ooit uit.

Tussenvraag: Je geeft aan dat er heel veel van die onderdelen normaal zijn? Welke onderdelen zijn dit dan precies?

Vraag daarvan is dan welke onderdelen van duurzaamheid vind je dan belangrijk? Wij zijn heel erg gericht op het maken van plekken waar mensen vrolijk van worden. We kijken eerst naar de omgeving en hoe kom je er en hoe staan die gebouwen in de omgeving? Vervolgens naar de gebouwen, en de ene keer is het een transformatie en de andere keer is het een nieuw gebouw, en als je dan echt op gebouw niveau komt qua duurzaamheid dan heb je natuurlijk verschillende onderwerpen. Je hebt natuurlijk energie waar enerzijds de regelgeving voor bestaat en anderzijds kan je jezelf afvragen hoe kun je dat nou het beste inpassen? De eisen in Nederland zijn voor nieuwe gebouwen al best aan de hoge kant op het gebied van energie wat je gebouw gebonden kan oplossen. Wij kijken naar die system die in de markt zijn vanuit verschillende facetten. We kijken naar wat is duurzaam en wat is er voor de lange termijn duurzaam? Wat kosten die systemen? Wat heeft de gebruiker eraan? We maken per onderdeel een afweging en dat doen we op al die niveaus, dus ook bijvoorbeeld op het bouwen met hout, dus als we bijvoorbeeld een kantoor hebben dan nemen houtbouw, staalbouw, betonbouw en hybride mee. We zetten ze dan naast elkaar en kijken wat de voor- en nadelen zijn. Vanuit duurzaamheid en vanuit hoe het eruit ziet, want hout is gewoon een mooi materiaal, heb je voorkeur naar hout maar als dit ertoe doet leiden dat je een extra kolom in je gebouw krijgt kan de klant er wel gewoon voor kiezen om voor staal of beton te gaan. Dus ik denk dat we in heel veel van die afwegingsprocessen komen deze overwegingen aan bod en worden ze bewust naar voren gebracht, van wil je dat wel of niet? Maar bij sommige projecten beslissen wij zelf ook niet en kunnen we niet even makkelijk iets meer duurzaamheidsambitie geven dan de standaard.

Tussenvraag: Is het dan een gebrek aan macht om het te implementeren of is het dan dat de vraag er nog niet genoeg naar is?

Laat ik het andersom uitleggen, wanneer je meewerkt aan een tender kan het een belangrijk onderdeel zijn om daar een goed verhaal bij te hebben en dat goed te presenteren. Vervolgens kom je in dat process waarin je dezelfde afwegingen gaat maken die wij ook maken en maak je een keuze of je het wel of niet gaat toepassen. Op heel veel onderdelen die [redacted] (weggelaten i.v.m. privacy) heeft meegenomen in de tender voor [redacted] (weggelaten i.v.m. privacy) onder het onderdeel duurzaamheid, blijkt nu dat de ene heel goed haalbaar zijn en andere compleet niet haalbaar zijn. Bijvoorbeeld voor het project is het gewoon niet mogelijk om niet de aansluiting op het riool te maken. Al het vuile water wil je niet in een tank onder je gebouw opslaan, dat klinkt leuk vanuit duurzaamheid maar het moet ook nog wel kunnen functioneren. Hier liet het echter wel toe om een

houten constructie te maken met betonnen vloeren maar we kiezen er wel voor om betonnen vloeren te doen omdat we anders de akoestiek van het gebouw niet onder controle krijgen. Dit is natuurlijk wel belangrijk als je mensen twee verdiepingen boven je niet wil horen springen. Ik vind het een belangrijk onderdeel om mee te nemen maar het is niet bij mij van 'het moet zo zijn'. In een tender wordt je natuurlijk uitgedaagd en beloof je dingen aan het begin die je kosten wat het kost ook waarschijnlijk zal moeten waarmaken. Terwijl wij vaak vanuit de positie van een eigenaar werken en dan worden duurzaamheidsonderdelen vaak op een andere manier afgewogen. Want dan gaat het en om de duurzaamheidsimpact, en om de financien, het gebruik, etc. Ik vind het belangrijk om ze in ieder geval op tafel te leggen en erover te discussiëren of je het eigenlijk wil.

Wij doen maar heel weinig tenders waarbij we alles van te voren bij elkaar verzamelen en dat ook als een duurzaamheidsverhaal vertellen, maar wij komen in de onderdelen van processen heel veel van die duurzaamheidsaspecten tegen waarin je opzoek moet naar de meest gangbare duurzaamheidsoplossing en die moet voorleggen en afwegen om te kijken of je dat een goed idee vind om dat te doen. Daarnaast werk ik al 10 jaar met BREEAM en WELL maar die hebben ook enorm veel nadelen als je helemaal doorgaat naar die certificering, tenminste voor het hele proces en wat het moet kosten om het te laten certificeren, terwijl de gedachtes van WELL en BREEAM wel hartstikke goed zijn. Dus ik vind dat je het als instrument moet gebruiken om die afwegingen te maken.

Aan de andere kant zie ik ook bij winkels dat als je 50 winkels moet verhuren dat de ene keten duurzaam is en de andere is half duurzaam en de andere is helemaal niet duurzaam. Als je al die mensen dingen moet opleggen dan beperkt het ook af en toe heel erg het gebruik van het gebouw. Dit wil niet zeggen dat ik niet wil zeggen dat je daar vooruitstrevend in moet zijn. Toen BREEAM uitkwam probeerde we alle winkels op zo'n hoog mogelijk niveau van BREEAM te krijgen maar hoe verder je hierin ging, hoe meer je winkels moet opleggen. Probeer ZARA maar eens op te leggen dat ze LED verlichting moeten doen in plaats van andere verlichting om hun kleren dan in een witte lamp te moeten verkopen, omdat de gele er 10 jaar geleden nog niet waren. Dat soort dingen zijn hele moeilijke discussies.

Ik denk dat een heel groot deel van Nederlandse belleggers al vind dat met een steeds strakker bouwbesluit, met betere EPC waarden, betere isolatie, eigen opwekking, etc. dat iedereen daar al een steentje aan bijdraagt omdat het moet. De vraag is dan wat doe je daar dan extra voor en doe je ook echt wat extra of is het voor een groot deel gewoon een mooi verkoop verhaal?

Vraag 2: Hebben deze acties een positief gevolg voor jullie competitieve voordeel?

Zeker maar ook daar is weer een splitsing in, als jij al een gebouw hebt en je wil dat herontwikkeling naar een andere functie of meer volume toevoegen, dan doe je dat denk ik vanuit een andere driver.

Een voorbeeld, stel je hebt al een stuk grond en je wil dat gaan ontwikkelen en je hebt al binnen het bestemmingsplan de ruimte om dat te gaan doen. Dan is de vraag: stel dat je EPC 0,1 lager is omdat je een x aantal zonnepanelen in de gevel verwerkt waarbij de zonnepanelen helemaal niet renderen omdat je investering te hoog is. Dan zijn er heel veel partijen die een andere overweging maken dan op het moment dat jij een partij bent die bijvoorbeeld meewerkt aan tenders waarin op dit moment in Nederland duurzaamheid een hele belangrijke competitief onderdeel is om op te scoren. Dan kies je dus een andere insteek. Een bedrijf als [redacted] (weggelaten i.v.m. privacy) behaald er enorm veel competitief voordeel uit dat ze dit als onderdeel van hun DNA hebben gemaakt. Dit helpt enorm in de eerste ronde wanneer je moet uitleggen wat voorn partij je bent en heb je iets met ingewikkelde projecten, dan kun je bij [redacted] (weggelaten i.v.m. privacy) natuurlijk maximale vinkjes zetten. Daar

werkt het denk ik als competitief voordeel. Bij opdrachtgunning bij de gemeente is het denk ik een enorm competitief voordeel op dit moment. Ik denk dat het ook al jaren een voordeel is in de huurdersmarkt. Bijvoorbeeld [redacted] (weggelaten i.v.m. privacy)verkoopt panden aan beleggers en investeerders vinden het vaker gewoon interessant om te investeren in een gebouw die iets duurzamer zijn dan normaal en daarnaast vinden huurders het steeds belangrijker om uit te stralen dat ze duurzaam zijn.

Tussentijdsevraag: Waar ligt het competitieve voordeel dan voor [redacted] (weggelaten i.v.m. privacy)*?*

Nou voor ons is het op diezelfde markten ook belangrijk. Belleggers en gemeenten vragen er gewoon om en onze gebruikers ook. Daarom zie je dat bij een ontwikkeling als Hudson Bay in Rotterdam WELL en BREEAM ook gewoon belangrijk zijn. Wij doen in heel veel projecten met BREEAM of met de ontwerp principes van WELL en zitten er heel veel onderdelen die we meenemen als materiaal gebruik in de bepaald keuze processen. Ik vind het belangrijk dat we er gewoon mee bezig met z'n allen en ik denk niet dat wij de meest duurzame ontwikkelaar kunnen zijn vanwege ons klanten profiel. Iets moet ook bij je horen en bij je passen, bij ons past dat we heel goed zijn in het realiseren van complexe projecten in binnenstedelijke locaties en hoe wordt de gebruiker vooral vrolijk van die plek en het gebouw. Dit heeft prioriteit, het is eerst de plek en daarna duurzaamheid.

Vraag 3: Denkt u dat er hier nog SDA's en / of acties ontbreken die NL ontwikkelaars ter beschikking hebben?

SDA's	Acties toegevoegd
Green product development	
Green supply chain management	
Green human resource management	
Green profiling and marketing strategy	
Green facility management	

Vraag 4: Wat is de impact van de SDA's op de KCI's?

what is de impact van de SDA's op de KCI's		competitieve indicatoren Nederlandse Ontwikkelaars						
		management competentie	organisatie competentie	technologische capaciteiten	Financiele competentie	markt aandeel	maatschappelijk verantwoord ondernemen	regionale concurrenie
duurzaamheidsmaatregelen ter om te komen tot een duurzame bedrijfsstrategie	Green product development	2	4	4	4	4	4	4
	Green Supply Chain Management	4	3	4	4	3	4	3
	Green Human Resource Management	2	4	3	3	4	4	4
	Green profiling and marketing strategy	4	3	3	4	4	4	4
	Green facility management (intern / extern)	4	3	3	4	4	4	4

26
25
24
26
26

Vraag 5: is er behoefte aan inzicht in welke duurzaamheidsmaatregelen bijdrage leveren aan het competitieve voordeel van uw bedrijf? Zo ja biedt deze tool inzicht en kan het helpen met prioriteren?

Tijdgebrek – vraag niet behandeld.

Appendix D – Focus group results

Onderdeel 1: Stellingen

Nederlandse vastgoed ontwikkelaars die nog niet duurzaamheid hebben geïntrigeerd in hun bedrijfsstrategie overwegen duurzaamheidsmaatregelen op projectniveau (financieel voordelig, lage onderhoudskosten). Echter merken bedrijven die duurzaamheid wel hebben geïntrigeerd in hun bedrijfsstrategie dat de voordelen zijn te merken op bedrijfsniveau (relaties met gemeente). Waarom zoeken sommige ontwikkelaars dan toch de voordelen (bijv. financieel) op project niveau?

Gegeven argumenten:

- Respondent 1:
    - Is sterk afhankelijk van het bedrijfsmodel en of je ontwikkeld voor derden of niet. Niet alle partijen willen werken met een zeer duurzame benadering.
    - Je bent vaak bezig met iemand anders portemonnee, dus je moet voor jezelf de duurzaamheidsoverwegingen meenemen, maar je moet ook zeker de vraag van de client meenemen. Als die niet zit te wachten op bijv. een warmtepomp, dan kan je proberen je eigen mening door te drukken, echter kan dit ook leiden tot een vermindering in hoeveelheid cliënten.
    - Heel rigide opstellen met betrekking tot duurzaamheid kan nadelig zijn omdat het werkveld niet zo rigide is. Deze instelling zal eerder leiden tot een vermindering in cliënten. Hierdoor loop je de kans dat een product niet zal voldoen aan de vraag
    - Partijen die werken in een niche markt, waar er een grote vraag naar duurzame oplossingen aanwezig is, kunnen ook eerder de winsten van duurzaamheid op bedrijfsniveau merken. Wanneer de vraag naar de extreme duurzame oplossingen niet aanwezig kan je je moeilijk onderscheiden.
- Respondent 2:
    - Het is afhankelijk van wat de markt wil. Wij stappen naar de markt en vragen ‘wat willen jullie?’ en vervolgens gaan wij binnen die kaders een zo duurzaam mogelijk product maken
    - Het is ook nog afhankelijk van de randvoorwaarden van het project. Er zit ook nog verschil in de project locatie.
    - Het is goed om iets heel duurzaams te willen bereiken maar je kan moeilijk met een heel duurzaam ontwerp onder de arm al aankomen.
    - Vastgoed is voor een gebruiker waar duurzaamheid vaak 1 van de rand voorwaarden is en primair is de vraag hoe ga ik dat ding gebruiken? Dit heeft prioriteit
    - Een groot deel van de vraag is ook waar komt de vraag van duurzaamheid vandaan. Wanneer de partijen waar je mee samenwerkt niet een strak beleid hebben omtrent duurzaamheid is het ook moeilijk om duurzaamheid te implementeren in de projecten.

Financiële barrières vormen het grootste obstakel voor Nederlandse project ontwikkelaars (hoge kosten, split incentive), echter toonde de interviews aan dat de grootste impact op het concurrentievermogen wordt behaald op financiële competentie (gemak tot financiering en vermogensgroei). Wat kan hier de verklaring voor zijn?

- Respondent 1:
    - Voorbeeld van financiering door banken: sommige banken die zijn enthousiaster over een duurzame investering maar uiteindelijk is het financiële verhaal wel belangijker.
    - De gemak tot financiering wordt niet perse makkelijker door duurzaamheid, deze ervaring missen wij. Beleggers zijn denk ik wel bereid om een scherpere yield te betalen voor een gebouw als deze zeer duurzaam is.
    - Er wordt door beleggers eerder een ondergrens bepaald voor duurzaamheid en niet zo zeer om positief te onderscheiden op het gebied van duurzaamheid. Deze ondergrens is vaak al bepaald door wetgeving die in veel gevallen al moeilijk is te halen laat staan het positief onderscheiden.
- Respondent 2:

- Als je niet duurzaam bent is de kans groter dat je eerder afvalt voor financiering dan dat het een onderscheidend voordeel oplevert
- De extra investering die eventueel wordt gedaan wordt vaak terug gezien in de exploitatie fase van een project waar de ontwikkelaar niet een bijzonder grote rol meer speelt. Het tweede deel van de stelling hebben wij nog niet zo zeer gemerkt
- De markt is niet transparant genoeg om hier de inzichten te krijgen of de financiële barrières zwaarder wegen dan de financiële voordelen die kunnen worden behaald.
- De vraag naar duurzaam vastgoed lijkt toch nog een beetje te ontbreken bij beleggers.

Alle respondenten van de interviews erkende dat er een competitief voordeel kan worden behaald door het implementeren van duurzaamheid in de bedrijfsstrategie, toch toont het onderzoek aan dat de gemiddelde Nederlander slechts voldoet aan wet en regelgeving, waarom wordt deze kans niet meer benut?

- Respondent 1:
  - In het verleden liep de regelgeving een beetje achter op het ambitieniveau van partijen maar nu is het zo dat de overheid duurzaamheid zo hoog als prioriteit heeft staan dat de eisen al bijna voorbij gaan aan de beschikbare technologie
  - Positief onderscheiden met de regels die er momenteel al zijn is daarom erg moeilijk.
- Respondent 2:
  - De eisen vanuit bijvoorbeeld gemeentes zijn al zo streng dat wanneer je voldoet aan die eisen dat je al snel goede gebouwen neerzet.
  - Er zijn meer manieren om gebouwen duurzaam te maken dan momenteel bekend zijn.
  - Er zijn veel tegenstrijdige eisen vanuit de overheid en de klant die ervoor zorgen dat niet altijd duurzaamheid kan worden geïmplementeerd. Er zijn dus meer aspecten die een rol spelen. Bijvoorbeeld als je heel goed isoleert wordt het weer moeilijk om het binnenklimaat goed te controleren, dit draagt veel consequenties.

Onderdeel 2: visualisaties bespreken

GAIA chart	
Positive	Negative
Makkelijk aan te relateren, wordt ook gebruikt bij BREEAM	Moeilijk te lezen, toelichting is nodig om de resultaten goed te kunnen begrijpen
	Geeft geen duidelijke volgorde weer
	Kan geen focus worden gelegd op de belangrijke onderdelen
	Doel van de visualisatie is nog onduidelijk, moeilijk te begrijpen waar het model naartoe wil werken

Heat-mapping	
Positive	Negative
Laat de totale scores van alle aspecten zien in cijfers	Drie verschillende schalen
De kleuren zorgen ervoor dat de gebruiker snel de aandacht kan leggen op de belangrijke aspecten van het model	De aandacht wordt vooral getrokken naar de kleuren en niet naar wat de kleuren betekenen
Een bepaalde volgorde maken zorgt ervoor dat het model gestructureerd is	

PCP	
Positive	Negative
Scores kunnen makkelijk worden geïnterpreteerd	Geeft geen volgorde weer van de SDA's
	Laat een gebruiker van de tool niet direct focussen op de belangrijke aspecten
	Moeilijk te begrijpen zonder verdere toelichting

Onderdeel 3: aanpassingen heat-mapping

- Schalen hetzelfde maken
- Meer nadruk leggen op de SDA's en KCI's