The role of competencies for sustainable entrepreneurship in strategic decision-making on critical issues of the entrepreneurial process of venture creation.

Master thesis

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WAGENINGEN
UNIVERSITY & RESEARCH

Course: Thesis Management Studies
Course code: MST-80433
ECTS: 33

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Abstract

This research focuses on the use of competencies for sustainable entrepreneurship by sustainable entrepreneurs in the critical issues of the venture creation process. Given the need for sustainable development, sustainable entrepreneurs and sustainable business models are becoming increasingly more important. The literature study on competencies for sustainable development, provided six competencies for sustainable entrepreneurship. These competencies were tested among sustainable entrepreneurs through a questionnaire and interviews. The questionnaire asked the entrepreneurs to rate themselves to what extent they think they possess these competencies. The interview then asked about the enactment of these competencies during critical issues of the venture creation process, such as organizing a team and finding first funding. The results of the questionnaire show that sustainable entrepreneurs think they possess all six competencies. The results of the interviews confirm the use of all six competencies, namely: strategic action competence, diversity competence, foresighted thinking competence, systems-thinking competence, normative competence and interpersonal competence. The results also show that for each critical issue of the venture creation process, there is one or two competencies that are most important.

Keywords: sustainable development, sustainable entrepreneurship, competencies, critical issues of the venture creation process

Summary

Introduction
Awareness is growing that our way of consuming resources is unsustainable. There is a need for sustainable development. Sustainable entrepreneurs have a major impact on sustainable development and the move towards a more sustainable use of our resources. However, it is unclear why sustainable entrepreneurs act in the way they do and which skills or competencies sustainable entrepreneurs need to create sustainable ventures. It is also unclear what the role of competencies for sustainable development is on the decision-making by sustainable entrepreneurs on critical issues of venture creation. Therefore, the objective of this research is to gain insight in the role of competencies of sustainable entrepreneurs in strategic decision-making on the critical issues of the venture creation process. This objective has led to the following research question: What role do competencies for sustainable entrepreneurship have in the decision-making process on critical issues of the venture creation process? To answer this research question, the following sub-questions have been formulated: Which competencies do sustainable entrepreneurs use in their business? Which competencies do sustainable entrepreneurs use in the strategic decision-making on critical issues of the venture creation process?

Methods
To answer the research questions, a questionnaire and interviews were held among 18 sustainable entrepreneurs. For the selection of the sample, two steps were taken. First, it is determined if a sustainable initiative is present in the business model. The use of the triple bottom line is a good indication for a sustainable initiative within the business model. Secondly, it is determined if the business model fits the technological group of sustainable business model archetypes. The technological group consists of the following business model archetypes: "Maximize material and energy efficiency", "create value from waste" and "substitute with renewables and natural processes". Additional selection criteria to the two steps in the selection process are: the interviewee is the (co-)founder of the business and the business exists for at least two years and preferably less than eight years. The questionnaire is in the form of a self-report, where sustainable entrepreneurs were asked to what extent they believe they possess the different competencies for sustainable development. The interviews focused on the use of the competencies and the entrepreneurs were asked for examples that showed how they used the different competencies. For the analysis of the interview data, a codebook was used to help identify the competencies and the critical issues of venture creation in the interviews.

Results
The results of the questionnaire indicate that sustainable entrepreneurs believe they possess all six competencies; strategic action competence, diversity competence, foresighted thinking competence, systems-thinking competence, normative competence, and interpersonal competence. Diversity competence, normative competence, and strategic action competence are most identified in the interviews. Some competencies are used more often together than others. The combinations of strategic action competence and diversity competence, and strategic action competence and normative competence are identified most frequent.

The interview data also provides insight in the use of competencies when dealing with critical issues of venture creation. Each critical issue has one or two competencies that are most used when dealing with that specific critical issue. Another result is that sustainable entrepreneurs mention the need for a certain mentality to be able to start and continue a sustainable business. Entrepreneurs who focus (only) on financial objectives are, according to sustainable entrepreneurs, deemed unfit to maintain and develop sustainable businesses.

Conclusion
This research complements existing literature on competencies for sustainable development by providing insights in the competencies that are used by sustainable entrepreneurs. Moreover, the results provide insight in the importance of the different competencies on critical issues of the entrepreneurial process of venture creation. These insights can help entrepreneurship education to include these competencies in order to support the development of successful entrepreneurs.

The conclude, the main research question is: What role do competencies of sustainable entrepreneurship have in the decision-making process on critical issues of venture creation? The data of the questionnaire indicates that sustainable entrepreneur think they possess all six competencies of sustainable entrepreneurship. The interviews show that sustainable entrepreneurs use all six competencies, but also how they use competencies in their entrepreneurial work context. The interview data shows a clear balancing of economic, social and environmental objectives by the sustainable entrepreneurs, but with the condition that the financial health of the company has first priority. Sustainable entrepreneurs are also willing to sacrifice financial gain over environmental or social objectives, but with the same condition of giving priority to the financial health of the company. The interview data also shows that each critical issue in the venture creation process has one or two competencies that are most used by the sustainable entrepreneur when dealing with these issues. The answer to the main research question is therefore provided in table 1, which is extracted from the results.

Table 1: Overview of most important competences per critical issue of venture creation.

Most important competence	Strategic action competence	Diversity competence	Normative competence	Foresighted competence	Systems-thinking competence	Interpersonal competence
Venture creation	X		X			
Organising a team		X				
Accessing first funding	X	X				
Portfolio focus	X					
Technology-market matching	X			X		
Business model adaptation	X					

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1. Introduction

During the last decades, awareness is growing that our current way of consuming resources is having a significant negative effect on environmental issues, such as climate change, ozone depletion, and ecosystem degradation (Brundtland, 1987; IPCC, 2007; United Nations, 2004). In other words: there is a need for sustainable development. Sustainable development is defined as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (Brundtland, 1987). This definition suggests that renewable resources should be used whenever possible and the use of non-renewable resources should be limited to maximize their usability for future generations. The consideration of future generations suggests that social, environmental and economic objectives are no longer seen as separate and competing, but as non-exclusive and equal to each other (Hall, Daneke, & Lenox, 2010). Entrepreneurship is increasingly mentioned as a driving force for a necessary revolution towards sustainable consumption, products and processes (Hall et al., 2010; Pacheco, Dean & Payne, 2010).

Sustainable entrepreneurship is a combination of sustainable development and entrepreneurship (Schaltegger & Wagner, 2010). Sustainable entrepreneurship is defined as "the process of discovering, evaluating, and exploiting economic opportunities that are present in market failures which detract from sustainability, including those that are environmentally relevant" (Dean & McMullen, 2007). Sustainable entrepreneurship combines economic, social and objectives (Hockerts, & Wüstenhagen, 2010). Sustainable entrepreneurship enables the entrepreneur to not only make profit, but also work on environmental and social dimensions of business and society (Lans et al., 2014; Stubbs, 2016).

Sustainable development, and therefore sustainable entrepreneurs, asks for a focus on competencies and higher order thinking skills (Wals & Jickling, 2002). Competencies enable successful task performance and problem solving of real-world problems, challenges and opportunities on an individual level (Barth, Godemann, Rieckmann & Stoltenberg, 2007; Dale & Newman, 2005). According to Lans et al. (2014, p38) competencies can be viewed as "a catalyst for creating a more critical, innovative, and reflexive culture that frequently questions its own routines, assumptions, and guiding principles". Competencies consist of knowledge, skills and attitudes that enable a successful performance (Wesselink, De Jong & Biemans, 2010; Mulder, 2014). According to Kuckertz & Wagner (2010) the skills and motivations of conventional entrepreneurs differ from those of sustainable entrepreneurs, because sustainable entrepreneurs not only focus on economic success, but also provide potential for the environment and society.

Sustainable entrepreneurs need certain competencies to make strategic decisions. Strategic decisions are defined as: "Intentional choices or programmed responses about issues that materially affect the survival prospects, well-being, and nature of the organisation" (Schoemaker, 1993, p107). Strategic decisions are needed to deal with critical issues in the process of venture creation (Reymen et al., 2015), such as accessing first funding and organising a team (Maine et al., 2015).

Even though sustainable entrepreneurs have a major impact on sustainable development (Brown, 2006; Lovins, Datta, Bustnes, Koomey & Glasgow, 2004; Vaitheeswaran, 2003), they have not yet been included in a study on the role of competencies for sustainable development in a business context. It remains unclear how existing competence frameworks explain how and why sustainable entrepreneurs act in the way they do. The role of competencies for sustainable development on the strategic decision-making by sustainable entrepreneurs on critical issues of the venture creation process is also unclear. Therefore, the objective of this research is to gain insight in the role of competencies of sustainable entrepreneurs in strategic decision-making on the critical issues in the venture creation process. This objective has led to the following research question: What role do competencies for sustainable entrepreneurship have in the decision-making process on critical issues of the venture creation process? To answer this research question, the following sub-questions have been formulated: Which competencies do sustainable entrepreneurs use in their business? Which competencies do sustainable entrepreneurs use in the strategic decision-making on critical issues of the venture creation process?

The thesis is set up as follows: chapter 2 describes literature on sustainable entrepreneurship, competencies of sustainable entrepreneurship and the critical issues of the venture creation process. Chapter 3 describes the methodology of the research. The results are summed up in chapter 4. In chapter 5 the methodology and results are discussed and in chapter 6 are the conclusion and recommendations.

2. Theoretical framework

In this chapter, literature on the topics of sustainable entrepreneurship, competencies of sustainable entrepreneurship, and entrepreneurial decision-making processes are analysed in order to come to a conceptual framework for the research.

2.1 Sustainable entrepreneurship

Sustainable entrepreneurship is seen as a method of creating a competitive advantage through identifying business opportunities for new products, production techniques, new markets and more sustainable business processes (Patzelt & Shepherd, 2010). The ability to identify these opportunities is an important part of sustainable entrepreneurship (Gaglio & Katz, 2011; Shane & Venkataraman, 2000). According to Klewits & Hansen (2014) and Dean & McMullen (2007) this means that sustainability is more than something to comply with or act for, it is a source for change and opportunities. According to Patzelt & Shepherd (2010, p632), sustainable development opportunities are "opportunities that sustain the natural and/or communal environment as well as provide development gain for others". Opportunities are inherent to market failure according to entrepreneurship literature (Dean & McMullen, 2007).

To seize these opportunities, barriers to the efficient functioning of markets (such as negative externalities) need to be overcome. Entrepreneurs can overtake these barriers and move markets to a more efficient state, where the ideal is a pareto efficiency. Pareto efficiency is defined as a market state in which "no redistribution of goods or productive resources can improve the position of one individual without making at least one other individual worse off" (Arrow & Debreu, 1954, p265). By seizing opportunities in environmental market failures, entrepreneurial actions can move markets closer to sustainability. Sustainable entrepreneurs develop sustainability as a success factor in their work context, implement sustainability criteria in business processes and share their vision of a sustainable future with society. This makes sustainable entrepreneurs change agents for sustainability (Hesselbarth & Schaltegger, 2014). Other examples of change agents for sustainability are: CSR managers, sustainable intrapreneurs and sustainable development champions.

Sustainable entrepreneurship combines economic, social and environmental objectives (Hockerts, & Wüstenhagen, 2010; Schaltegger & Wagner, 2010). Combining social, environmental and economic objectives is known as the triple bottom line (Elkington, 1998; Kuckertz & Wagner, 2010; Sherman, 2012). The triple bottom line is an important element of corporate social responsibility strategies or corporate sustainability (Hall et al., 2010). Businesses that use the triple bottom line not only work towards economic value creation, they also have potential for adding value to societal and environmental aspects. Sustainable entrepreneurs need certain skills and qualities to balance the triple bottom line in their business (Schroeder & DeNoble, 2014). Focusing on economic objectives is not enough, societal and environmental objectives are also important for sustainable entrepreneurs. This may require different skills and qualities than conventional entrepreneurs need.

Sustainable development, and thus sustainable entrepreneurship, asks for a focus on competencies and higher order thinking skills (Wals & Jickling, 2002). These skills are also known as competencies of sustainable entrepreneurship.

2.2 Competencies of sustainable entrepreneurship

Sustainable entrepreneurs need certain competencies to balance economic, environmental and social objectives. Competencies enable successful task performance and problem solving with respect to real-world problems, challenges and opportunities on an individual level (Barth et al., 2007; Dale & Newman, 2005). Competencies consist of three elements: knowledge, skills and attitudes (Wesselink et al., 2010; Mulder, 2014). Knowledge is required to understand the consequences of actions and how to get the desired results. Skills are needed to perform sustainability tasks and the value system (attitude) supports the actions of sustainable entrepreneurs (Svanstrom, Lozano-Garcia & Rowe, 2008). According to Lans et al. (2014, p38) competencies can be viewed as "a catalyst for creating a more critical, innovative, and reflexive culture that frequently questions its own routines, assumptions, and guiding principles".

Five studies worked on identifying and defining competencies, specifically for change agents for sustainability in business contexts. Sustainable entrepreneurs are a type of change agents for sustainability, however none of these studies have used sustainable entrepreneurs as research subjects. The study of Hesselbarth & Schaltegger (2014) studied MBA Alumni, Osagie et al. (2016) studied CSR managers and conducted a literature review, and Wesselink et al. (2015) studied corporate sustainability managers. However, both Lans et al. (2014) and Ploum et al. (2017) studied would-be entrepreneurs (students). These five studies all started with the same initial competencies (Ploum et al., 2017), but came up with different combinations in their frameworks. Table 1 provides an overview of the five studies, their research subjects and the competencies identified.

Table 1: Overview of studies on competencies of change agents for sustainability in a work context

Study	Subjects	Competencies identified in study
Hesselbarth & Schaltegger, 2014	MBA alumni	Strategic competence Systems thinking competence Anticipatory competence Normative competence Interpersonal competence
Osagie et al., 2015	Literature review & CSR managers	Anticipating CSR challenges Understanding CSR-relevant systems and subsystems Understanding CSR-relevant standards CSR management competencies Realizing CSR-supportive interpersonal processes Employing CSR-supportive personal characteristics and attitudes Personal value-drive competencies Reflecting on personal CSR views and experiences
Wesselink et al., 2015	Corporate sustainability managers	Systems thinking competence Embracing diversity and interdisciplinarity competence Interpersonal competence Action competence Strategic management competence
Lans et al., 2014	Would-be entrepreneurs (students)	Systems thinking competence Embracing diversity and interdisciplinarity competence Foresighted thinking competence Normative competence Action competence Interpersonal competence Strategic management competence

Table 1 continued: Overview of studies on competencies of change agents for sustainability in a work context.

Ploum et al., 2017	Would-be entrepreneurs (students)	Strategic action competence
		Systems thinking competence
		Embracing diversity and interdisciplinarity competence
		Foresighted thinking competence
		Normative competence
		Interpersonal competence

Since the studies of Lans et al. (2014 and Ploum et al. (2017) are the only studies looking at competencies for sustainable entrepreneurship, they are most likely to have the best competence framework to use for this study. The study of Lans et al. is used as a starting point to discuss the differences with the frameworks of Hesselbarth & Schaltegger, Osagie et al, and Wesselink et al.

Strategic management competence, systems thinking competence, and interpersonal competence are included in all five studies. The normative competence is only absent in the study of Wesselink et al. Possible explanations, according to Wesselink et al. (2015), are that businesses are not ethical and only focus on profit maximisation or that the normative competence is internalised in the behaviour of CSR managers. In this study, the entrepreneurs are preselected on their sustainable practice which could result in them being more ethical than conventional entrepreneurs or managers. Embracing diversity and interdisciplinarity competence is included in the studies of Lans et al. (2014) and Wesselink et al. (2015), but not in the studies of Osagie et al. (2015) and Hesselbarth & Schaltegger (2014). A possible explanation could be that CSR-managers do not need to gather around people with different disciplines and backgrounds, whereas sustainable entrepreneurs generally do need to find people with different disciplines to work on a sustainability issue. Foresighted thinking competence is included in all studies, except Wesselink et al. (2015). Wesselink et al. (2015) suggests that foresighted thinking competence is more important in the starting phase than in a more mature phase. The CSR managers used in the study of Wesselink et al. (2015) worked in businesses that are in a more mature phase. The difference between the study of Lans et al. and Ploum et al. is that Ploum et al. tested the framework of Lans et al. and concluded that the strategic management competence and action competence could be merged in strategic action competence without losing a good model fit.

To conclude this chapter, the competence framework of Ploum et al. (2017) is most suitable for this research. A definition of the six competencies identified by Ploum et al. (2017) is given below.

1. Strategic action competence is the ability to arrange tasks, people and other resources, inspiring and motivating others, evaluating projects and taking action and initiative to effectively deal with sustainability issues (Ploum et al., 2016).
2. Systems-thinking competence is the ability to identify and analyse all relevant (sub)systems across different domains (people, planet, profit, otherwise known as triple bottom line) and disciplines, including their boundaries (Lans et al., 2014).

3. Embracing diversity and interdisciplinarity competence is the ability to structure relations, spot issues and recognize the legitimacy of other viewpoints in business decision-making processes regarding environmental, social and economic issues, to involve all stakeholders and to maximize the exchange of ideas and learning across different groups (inside and outside the organization) and different disciplines (interdisciplinarity) (De Haan, 2006; Ellis & Weekes, 2008).

4. Foresighted thinking competence is the ability to collectively analysis, evaluate and craft "pictures" of the future in which the impact of local and/or short term decisions on environmental, social and economic issues is appreciated on the global scale and on the longer term (Wiek et al., 2011).

5. Normative competence is the ability to map, apply and reconcile sustainability values, principles and targets. The normative competence enables the sustainable entrepreneur to assess and improve the (un-)sustainability of social-ecological systems, based on such values and principles (Gibson, 2006; Wiek et al., 2011; Blok et al., 2015).

6. Interpersonal competence is the ability to motivate, enable and facilitate collaborative and participatory sustainability activities and research (Lans et al., 2014).

2.3 Strategic decision-making on critical issues in the venture creation process

Sustainable entrepreneurs need competencies to be able to make decisions on critical issues in the entrepreneurial process of venture creation. These decisions are called strategic decisions and are important, because they determine not only the path towards or away from sustainable development (Bolis, Morioka & Sznelwar, 2017), but also shape the path of the organisation into its future (Gibcus, Vermeulen & Jong, 2006). Strategic decisions are important to a firm's viability and are defined as "Intentional choices or programmed responses about issues that materially affect the survival prospects, well-being and nature of the organization" (Schoemaker, 1993, p107).

Strategic decisions need to be made on the critical issues of the venture creation process (Reymen et al., 2015). Maine et al. (2015) derived the following six critical issues in new venture creation: founding partner selection, venture creation, accessing first funding, technology-market matching, deciding on portfolio focus, and business model adaptation. The critical issues of founding partner selection, venture creation, and accessing first funding are common across entrepreneurship literature (Bhide, 2000; Garnsey, 1998; Neck et al., 2004; Hsu, 2007; Zhang et al., 2010). A short explanation is given for each critical issue.

The first critical issue to be discussed is the decision to create the venture (Maine et al., 2015). This term may suggest that it represents all critical issues of venture creation, but it is merely part of the venture creation process. Creating the venture, represents the actual decision to start a business including the motivation behind this decision. The actual creation of the venture usually happens after a team is created and resources have been gathered (Neck et al., 2004).

The second critical issue is selecting a founding partner and that generally occurs only once (Maine et al., 2015). Entrepreneurs tend to choose founding partners through people who the entrepreneurs already know, rather than finding founding partners externally (Maine et al., 2015). Since not all entrepreneurs have founding partners, the decision-making process of "founding partner selection" is broadened to "organise team". This broadening is supported across entrepreneurship literature, that recognises organising a team as a critical

issue of the venture creation process (Maine et al., 2015; Carter & Gartner, 1996; Kickul et al., 2006; Baron, 2007; Timmons & Spinelli, 2008; Rasmussen et al., 2011).

The third critical issue is finding first funding and it is vital for starting a business (Rasmussen, 2011; Maine et al., 2015). Funding can be found internally and externally. Internal funds come from with own capital, friends, and family. External capital can be found through crowdfunding with the general public, angel investors, corporates, governments, incubators or banks (Bocken, 2015).

The fourth critical issue is technology-market matching and it is of great importance to create value for science-based firms that have a broad technology platform (Maine & Garnsey, 2006). A technology platform is a technology that is applicable to multiple cases or situations, where the company needs to choose or find one or more target markets to prioritize the sale of the technology or product (Maine et al., 2014). For firms without a technology platform or specific technology, it is also important to match the products to markets in order to make money and develop the venture. Technology-market matching is about recognizing and prioritizing technological solutions for a specific market application or finding the appropriate market for a technology (Maine et al., 2014).

The fifth critical issue is deciding on the range of the product portfolio (Maine et al., 2012; Maine et al., 2014). Entrepreneurs can choose between a narrow range, a broad range or a single market application (Maine & Garnsey, 2006; Maine et al., 2012). A broader range of products is generally seen as having a positive effect on sales volumes and a competitive differentiation, but a too broad range of products could lead to confusion by the customers and thus weakening sales and the competitive position of the business (Tolonen, Shahmarichatghieh, Harkonen, & Haapasalo, 2015). A wide range of products also decreases the performance of the operational supply chain. Deciding on the product portfolio can have significant consequences for the performance of the company and is therefore important to overthink carefully by the entrepreneur.

The sixth critical issue is business model adaptation. According to Chesborough (2010), business model adaptation is important for commercialization in the long term, but it is also a difficult decision-making process, because some changes to the business model will fail and the organisational processes of the company must also change when the business model is adapted. As long as experiments provide new insights and information, with an affordable loss in case of failures, experiments with business model innovation should be encouraged. New information from experiments may even lead to opportunities, for new markets and products, that were previously unknown (Chesborough, 2010).

The following six critical issues in the venture creation process are used in this study:
- Organise team (Maine et al., 2015; Carter & Gartner, 1996; Kickul et al., 2006; Baron, 2007; Timmons & Spinelli, 2008)
- Venture creation (Maine et al., 2015)
- Accessing first funding (Maine et al., 2015; Carter & Gartner, 1996; Kickul et al., 2006; Baron, 2007; Timmons & Spinelli, 2008)
- Technology-market matching (Maine et al., 2015; Maine & Garnsey, 2006)
- Deciding on portfolio focus (Maine et al., 2015; Maine et al., 2014; Parry 2012; Maine, 2012)
- Business model adaptation (Maine et al., 2015; Parry, 2012)

Based on the literature study a theoretical framework is developed. In figure 1 the theoretical framework is shown, with on the left side the competencies of sustainable entrepreneurship and on the right, the critical issues of the decision-making process.
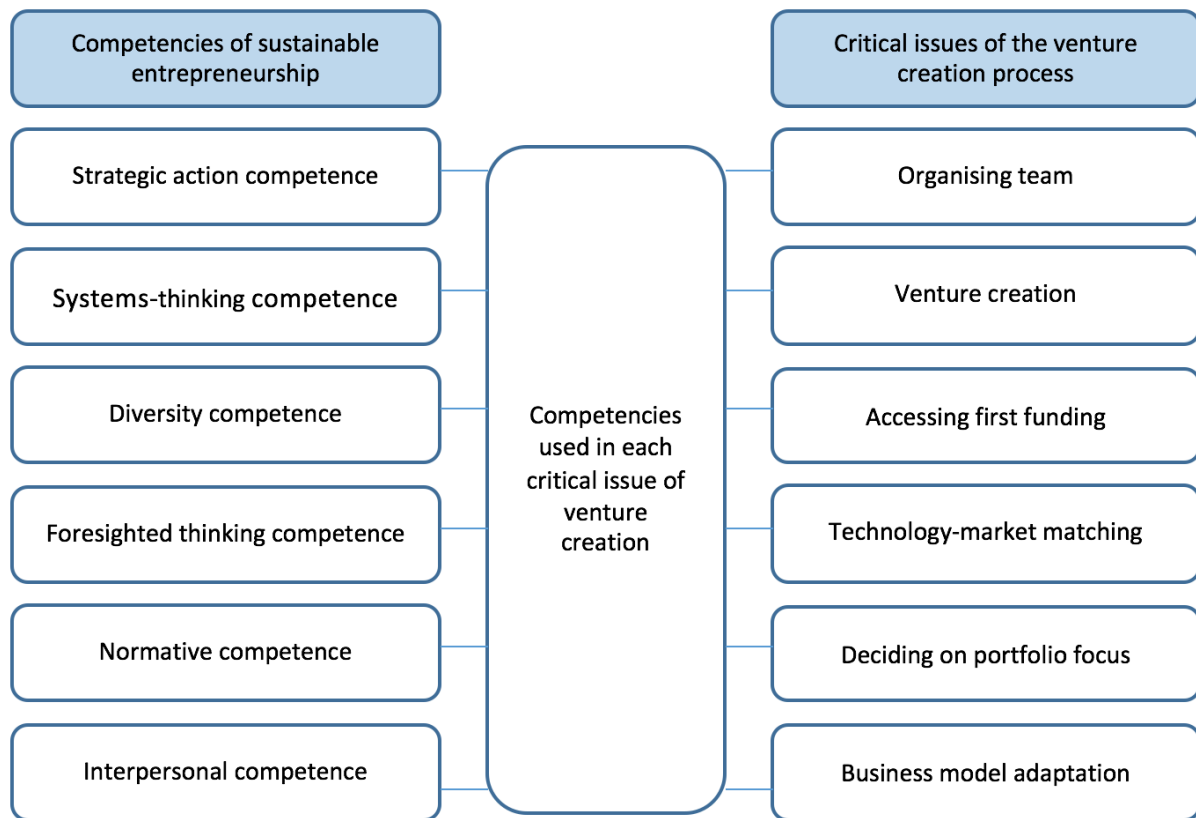
Competencies of sustainable entrepreneurship		Critical issues of the venture creation process
Strategic action competence		Organising team
Systems-thinking competence	Competencies used in each critical issue of venture creation	Venture creation
Diversity competence		Accessing first funding
Foresighted thinking competence		Technology-market matching
Normative competence		Deciding on portfolio focus
Interpersonal competence		Business model adaptation

Figure 1: Theoretical framework.

3. Research methodology

This chapter discusses the methodology used for the research. First the sample selection is discussed, then the data collection. The methods of analysis are explained with an example and this chapter ends with the reliability and validity of the research.

3.1 Setting and sample

For this research, a quantitative and qualitative approach are used to identify the competencies of sustainable entrepreneurs and identify which competencies are used in the different critical issues a sustainable entrepreneur faces in the venture creation process. This study used data collected through interviews with sustainable entrepreneurs (n = 18). These entrepreneurs are all Dutch, residing in the Netherlands and working (mostly) in the Netherlands.

The selection of the case studies is made in two steps. The first step is to determine whether a sustainable initiative is present in the business model. The use of the triple bottom line is a good indication for a sustainable initiative within the business model. To check for the triple bottom line in the business model, information about the company has been looked up on the company website and through a telephone call to make an appointment for the interview. The second step is to check if the business model fits one of the archetypes of business model innovations identified by Bocken, Short, Rana & Evans (2014). There are three groups of archetypes of sustainable business models: Technological, Social and Organisational (Bocken et al., 2014). The technological group consists of the following archetypes: "Maximize material and energy efficiency", "create value from waste" and "substitute with renewables and natural processes". The Social and Organizational groups of archetypes are less focused on products and materials and more on the health and welfare of stakeholders and the community, solutions to reduce consumption and production, and prioritizing the delivery of social and environmental benefits over economic profit. The focus for the empirical sample for this study is on finding sustainable business models that fit the "technological" group of archetypes. Figure 2 shows the two steps of the selection of the entrepreneurs.
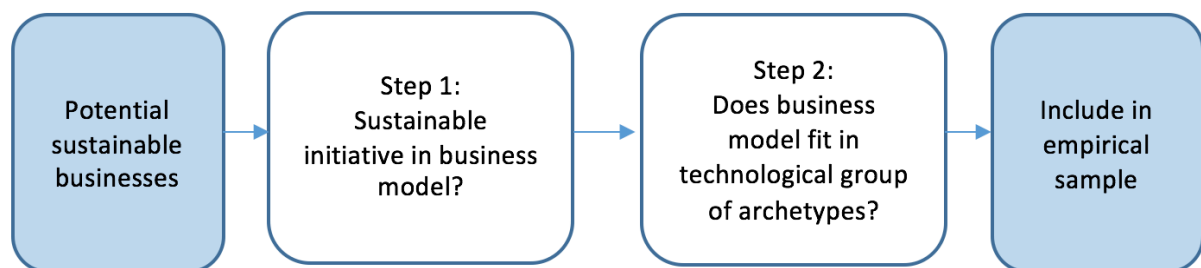

Figure 2: The two steps in the selection process of the empirical sample.

Additional selection criteria to the two steps in the selection process are: the interviewee is the (co-)founder of the business and the business exists for at least two years and preferably less than eight years.

3.2 Data collection

For the collection of data, an online questionnaire and an interview were used. The questionnaire is the same as used by Ploum et al. (2017) and the interviews are based on the different items of the competencies mentioned in the questionnaire.

The questionnaire collects data to identify the competencies used by sustainable entrepreneurs. The questionnaire asks entrepreneurs to rate, on a scale of one to ten, to what extent they think they possess the items of the competencies. These items are descriptions of parts of the competencies. This is called a "competence self-report" Ploum et al. (2017). There are three criteria for "self-reports": multiple indicators per competence, a given context for each competence and the indicators should describe concrete behaviour (Braun, E., Woodley, A., Richardson, J. T. E. & Leidner, B. 2012). The used questionnaire meets these three criteria.

The interview is semi-structured with pre-recorded questions as a basis. These pre-recorded questions are based on the items of the competencies mentioned in the questionnaire. Depending on the given answers follow-up questions can be raised. The interview is based on five themes for the six competencies. The operationalisation of the competencies and critical issues of venture creation, used for the interviews, is provided in appendix 1. Table 2 provides an overview of the different themes and corresponding competencies.

Table 2: the five themes and corresponding six competencies.

Theme	Competency
Personal values, motivation and action	Normative competence and strategic action competence
Stakeholders	Diversity competence
Systems thinking	Systems thinking competence
Risk and uncertainty	Foresighted thinking competence
Communication	Interpersonal competence

The questionnaire is included in appendix 2 and the interview guide is included in appendix 3.

3.3 Methods of analysis

The questionnaire is analysed with spreadsheet software Microsoft Excel to map the outcome of the "self-report" of the entrepreneurs on the different competencies. General information about the entrepreneurs, such as age, experience and education, is also included.

The interviews are transcribed and then coded with the help the ATLAS.ti software program. The codes used in the analysis are both "a priori" and new codes identified by reading through the interviews. The "a priori" codes are for the competencies and critical issues of venture creation and are included in the codebook in appendix 4. New codes are identified during the coding with "a priori" codes and include codes such as "financial management" and "people management". The codes are linked to quotes from the interviews. After all interviews have been coded, the data is exported in tables with a clear overview of the results. For clarification, an example of linking codes to quotes from the interviews is provided. Table 3 shows part of the codebook for normative competence.

Table 3: part of the codebook.

Theme / Code	Description	Measures/indicators
Normative competence	The ability to map, apply and reconcile sustainability values, principles and targets. The normative competence enables the sustainable entrepreneur to assess and improve the (un-)sustainability of social-ecological systems, based on such values and principles	Norms, values, principles, good sustainable practice, explaining decisions on sustainability

The following quote comes from the interviews:

"*We make choices in this company, sometimes at the expense of profitability, and if you are a listed company, that is not really an option. People are pushing you to maximize short-term return. Sustainable companies are not built on short-term returns*" Entrepreneur 16.

As can be seen with the help of the description and indicators of normative competence in the codebook, the above-mentioned quote shows the use of normative competence. The quote fits with the description and the indicators. In this quote, the entrepreneur makes choices that sometimes are at the expense of profitability to meet a desirable outcome regarding sustainability. This is a clear example of making decisions based on values and principles.

3.4 Reliability and validity

The pre-recorded questions of the interview ensure that the most important topics are discussed and they also provide a foundation for the external validity of the research. All interviews are recorded and transcribed to further enhance the reliability and validity. The construct validity is improved by using pre-recorded questions during the interviews. These questions are based on the study by Ploum et al. (2017). The external validity is improved by using 18 interviews as the basis for the data. A set of criteria, to support the selection of the research subjects, further contributes to combat the external validity. The internal validity is relatively unimportant since this is an explorative research. To improve the ecological validity, the interviews will be held at the company location of the sustainable entrepreneurs. This helps them to comfortably participate in the interview and provide honest answers.

The recall bias, or response bias, is a phenomenon that needs to be taken into account when performing this research since it could negatively impact the validity of the research. To minimize the effect of the response bias, the questionnaire is self-administered and the interview questions are pre-recorded to formulate them in a neutral way. Also, when asked about the use of competencies, the entrepreneurs were asked to provide an example for context. This should help minimize the effect of the response bias.

3.5 Conceptual model

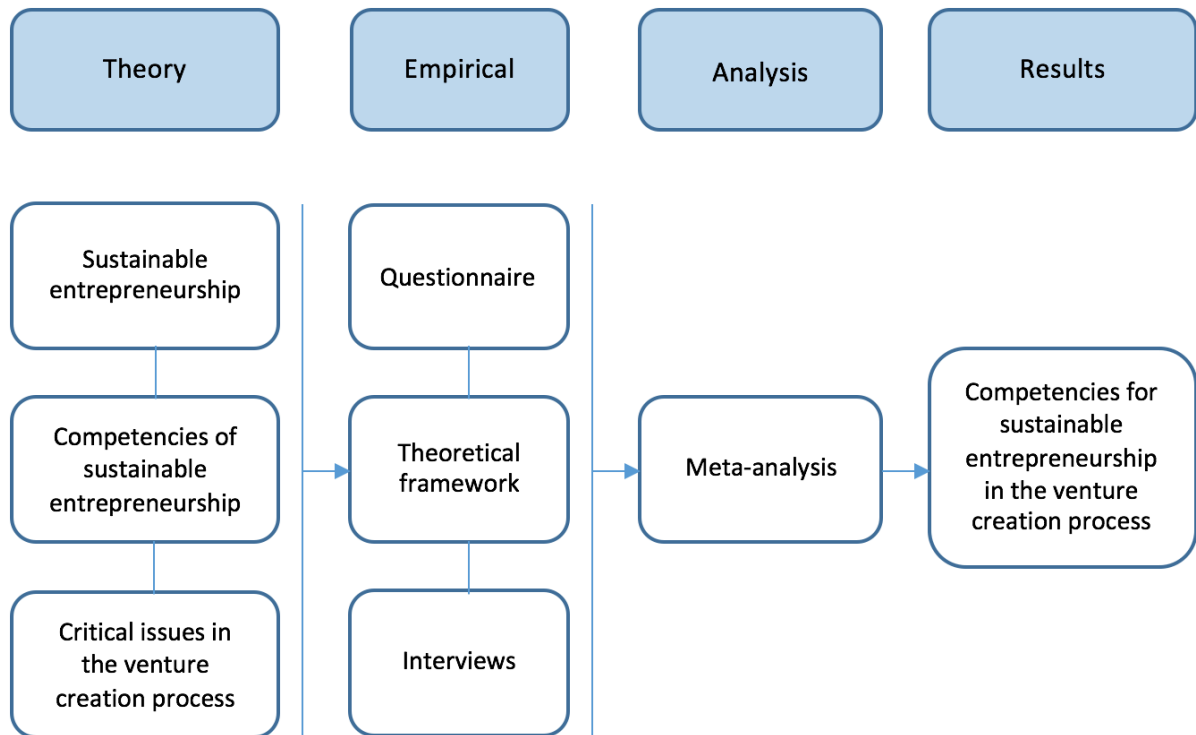The conceptual model of this research is shown in figure 3.

Figure 3: Conceptual model.

4. Results

Chapter 4.1 reports the findings of the questionnaire. Chapter 4.2 reports on the findings of the interviews and is divided into three parts: 4.2.1 reports on the competencies in the interview data, 4.2.2 reports on the critical issues in the interview data, and 4.2.3 discusses other interesting findings in the interviews. Table 4 provides an overview of the general characteristics of these entrepreneurs.

Table 4: general characteristics of sample of entrepreneurs.

Entrepreneur	Company founded	Number of employees	Experience in years as entrepreneur	Gender	Age	Sector
1	1995	65	35	Male	56	Energy
2	2015	2	2	Male	26	Construction
3	2015	1	3	Male	28	Consumer electronics
4	2011	2	20	Male	49	Paper industry
5	2010	2	20	Male	54	Clothing industry
6	2012	2	20	Male	53	Manufacturing industry
7	2009	11	8	Male	30	Toy industry
8	2014	8	6	Male	32	Real Estate
9	2011	4	5	Female	30	Consumer goods
10	2012	6	6	Male	45	Food industry
11	2012	30	35	Male	63	Consumer electronics
12	2009	13	8	Female	51	Clothing and textile
13	2010	10	6	Male	30	Chemical industry
14	2014	2	18	Male	38	Consumer goods
15	2012	3	5	Male	29	Food industry
16	2010	10	10	Male	54	Clothing and textile
17	2012	12	12	Male	32	Construction
18	2015	2	2	Female	21	Office supplies

As can be seen in table 4, most entrepreneurs in this study are male and 9 have had entrepreneurial experience before they started their current business.

4.1 Results from questionnaire

The questionnaire included items where the entrepreneurs had to rate themselves to what extent they possess and use the different competencies identified in the interviews. Table 5 shows the results of the questionnaire the questionnaire.

Table 5: results of questionnaire on competencies used by sustainable entrepreneurs.

Competencies	Average score	Standard deviation sample	Lowest score	Highest score
Diversity	7,61	1,07	5	10
Foresighted	7,39	1,33	4,67	10
Systems	7,24	1,53	3,8	10
Normative	7,61	1,41	4	10
Interpersonal	6,94	0,83	5,33	8
Strategic action	7,15	0,96	5,75	9

The average score for all six competencies is 7 out of 10 or higher. These results show that sustainable entrepreneurs think they possess all six competencies. However, looking at the individual scores it becomes clear that some entrepreneurs score themselves relatively high or low compared to the average score. To study if the use of competences in practice corresponds with the results of the questionnaire, interviews were conducted with the entrepreneurs.

4.2 Results from the interviews

In chapter 4.2 the results of the interviews are reported. Chapter 4.2 is divided into three parts: 4.2.1 reports on the competencies in the interview data, 4.2.2 reports on the critical issues in the interview data and the corresponding competencies, and 4.2.3 discusses other noteworthy findings in the interviews.

4.2.1 Competencies

The interviews are the second data source of this study. The interview data is analysed for the six competencies identified in chapter 2.2. Table 6 presents an overview of the number of times each competence is identified in the interviews.

Table 6: number of times each competency was identified in the interview data.

Competencies	Diversity	Foresighted thinking	Systems thinking	Normative	Interpersonal	Strategic action
# Identifications	152	86	61	126	27	156

Diversity competence, normative competence, and strategic action competence are identified the most with 152, 126, and 156 identifications respectively in the 18 interviews. Interpersonal competence is least identified in the interviews with 27 identifications. For each competence, an example from the interviews is given.

Diversity competence entails bringing together people with different disciplines and expertise in order to work on a sustainability issue. Diversity competence is not just for funding and finding suppliers and partners, but mostly for finding people with the knowledge and expertise that the company needs to move closer to tackling a sustainability issue. Diversity competence is one of the most identified competencies in this dataset with 152 occurrences in the interviews. Two examples of diversity competence from the interviews are the following quotes:

"*To work on the issue of unsustainable and expensive light in developing countries, we needed a technological product that can replace kerosene lamps and candles. To build this product, we needed experts from all possible disciplines. Industrial design, battery technology, photovoltaic technology, LED's, logistics, marketing, sales etc. We brought those people together to work on this product, by placing advertisements and contacting employment agencies.*" Entrepreneur 11.

"*We are currently in discussion with a company that can recycle our electronic cables. Our suppliers are not recycling and we cannot do it ourselves, but it is part of our value proposition to our customers. Therefore, we need a partner that can recycle parts of our products.*" Entrepreneur 3.

The above quotes show the need for experts from different disciplines to work together. The quotes mention the sustainability issues that require different disciplines. These examples also show through which ways the entrepreneur is finding the experts. Therefore, these are clear examples of the use of diversity competence. There is also an example of a situation where an entrepreneur did not use diversity competence. The example is given in the following quote:

"We do not work together with the technical university. They have a lot of know-how on renewable energy, but it is a very technical university and we only buy proven technology. We do not invest in experiments and trials." Entrepreneur 1.

The above quote shows that the entrepreneur could use knowledge of the university, but chooses not to. It is the only example of not using diversity competence, when it could be of use.

Foresighted thinking competence entails the ability to anticipate future developments and to understand the consequences of actions on a longer timescale and in a bigger perspective. The entrepreneurs indicate the importance of foresighted thinking when looking for markets where there is demand for the products and technology they can offer, but also to identify opportunities and risks for the company. Foresighted thinking competence is identified 86 times in the interviews. Two examples of foresighted thinking competence are the following quotes:

"Until December, I had a runway of two months. After those two months, the future was uncertain. Now I have a much bigger perspective and I can see bigger potential deviations in the future of the company. I can see the positive trends and the negative trends. So, I think it is a good strategy to keep it smaller and not look too far ahead, but it can be useful to look for and anticipate future developments. People think it is scary to only have two months, but at the same time you only have to worry about two months. Now, I can worry about years and that is a much bigger perspective than I had before." Entrepreneur 8.

"We are the first weather dependent energy company. In the future, we will include energy storage at the wind turbines. When the wind turbines do not produce energy, the battery can take over. Battery prices are falling and energy storage is becoming increasingly more attractive." Entrepreneur 1.

The above quotes show the entrepreneurs can see positive and negative trends in future developments and to anticipate on these developments. They also mention uncertainty that is part of working on a sustainability issue. Therefore, this is an example of foresighted thinking competence.

Systems-thinking competence entails understanding the systems and all their parts that are relevant for the sustainability issue that is being worked on. The cause and effects of sustainability issues can be understood by using a systems-thinking approach. Entrepreneurs often mentioned the importance of systems-thinking when talking about finding a solution for a sustainability issue. Systems thinking competence is identified 61 times in the interviews. Two examples of systems-thinking competence are the following quotes:

"There is a lot of research on desalination of seawater, but there is only attention to the value of freshwater. After desalination, the remaining salt is thrown away in the desert or sea. That has a negative impact on the environment and could also have economic consequences. The problems of salt differ around the world, but the main causes are the same: climate change or massive desalination. The issue is that there is a salt surplus and that this surplus has no value. So, you either have to solve climate change or find a way to increase the economic value of salt." Entrepreneur 2.

"We mapped the entire process from mine, transport to factory, transport to The Netherlands to the printing office, to the warehouse and to the customer. We calculated that a truck from Portugal or Sweden will cause more pollution than shipping the products from Taiwan to The Netherlands by ship. This has to do with the volume per vehicle." Entrepreneur 4.

The above quotes mention the understanding of the whole system where the sustainability issue is part of. The ability to identify the linkages of the system as a whole is an example of systems-thinking competence.

Normative competence entails using moral values and principles to make decisions on social and environmental aspects. These decisions can result in choosing less profitable options over more profitable ones and therefor the prioritising of environmental and social objectives over economic objectives. Normative competence is identified 126 times in the interviews. Two examples of normative competence are the following quotes:

"Enforcing the use of rare earth metals from non-China sources has cost us a lot of money, but to us it is worth it. Materials are cheaper from locations where working conditions and social services are poor, and we are willing to pay more for our materials when they come from places where the employees are treated well. We see this as a social investment […] When new materials are available that do not need rare earth metals, we will switch over immediately even if it is more expensive." Entrepreneur 1.

"We make choices in this company that sometimes negatively impact the profitability. If you are a listed company, that is not an option. People will demand maximisation of short-term profits. Sustainable companies are not built for short-term yields." Entrepreneur 16.

The above quotes are clear examples of normative competence, because they mention the choice of the entrepreneur to choose a more expensive sustainable product, over a cheaper less sustainable product. This quote shows that the entrepreneur knows what is seen as a 'good sustainable practice' in their field. This is a clear example of normative competence.

Another noticeable result from the interviews is that in some cases, normative competence did not play an important role in the first steps in the venture creation process. In later stages where the company was established and performing well, normative competence started to influence the decisions made by the entrepreneur. This is illustrated in the following quote:

"When I decided to start this company, I saw an economic opportunity and was not thinking about environmental or social aspects. Once the company started growing and having an impact, it became clear to me that social and environmental aspects of the company are also important. Now, I am not only focussing on growth for the company, but also looking for opportunities to minimize the environmental impact." Entrepreneur 1.

In the interviews, some entrepreneurs also mentioned examples of behaviour that can be classified as the opposite of normative competence. It is important to note that these examples are exceptions to the general result that sustainable entrepreneurs use normative competence. These examples show that sustainable entrepreneurs, in some situations, choose less sustainable options over more sustainable options. This is not to say that sustainable entrepreneurs do not use normative competence or that they are not more sustainable than conventional entrepreneurs. A better description of these examples is that they are examples of sustainable entrepreneurs making concessions to the sustainability objectives in favour of economic or practical considerations. These concessions of normative competence entail not letting moral values and principles influence the decisions made for the venture. This generally results in choosing economic objectives over environmental and social objectives. An example of a concession of normative competence is the following quote:

"It is very difficult to order these products from China. If you also include demands regarding sustainability, the ordering process will only get more difficult. That is why we, at this moment, do not pay attention to social or environmental aspects when ordering products." Entrepreneur 3.

In the above quote the concession of normative competence can be identified in that this entrepreneur chooses a less sustainable product, because it is easier to order rather than putting in more effort to buy a more sustainable product. These concessions show that sustainable entrepreneurs do not necessarily always choose the most sustainable option. If they do not choose a sustainable option, the main reason is because of economic or practical motives.

Interpersonal competence entails using social skills to bring together people from different backgrounds and to deal with disagreements between members of the entrepreneurial team, but also with other stakeholders. Interpersonal competence is identified 27 times in the interviews. Two examples of interpersonal competence are in the following quotes:

"Internal communication has been a challenge, because we had an Italian, Colombian and Dutch culture. […] Especially the Italian culture with its temper. You have to understand where it comes from, before you can deal with it. So, the first time you experience it you think "wow, this guy is furious, this is never going to stop". While the next day, you can talk with him just fine and you can explain why certain things are what they are. But at that moment when he is emotional, you have to stop arguing. You will not resolve the issue that day, tomorrow is a new day. That is something I learned over time." Entrepreneur 15.

"We had a green idea box for some time, but that is too static. Anyone with an idea should be able to just walk in. […] Then we will say: that is a good idea, go and try it. If they do, they will get the credits. It is not about money, the people who work here like to get kudos. Just recognition for their effort. We regularly have meetings where someone with an idea gets the opportunity to present their idea and explain what they improved." Entrepreneur 1.

The first quote mentions the ability to understand someone's emotional state and knowing how to deal with people who need to blow off steam or come from different cultures and backgrounds. The second quote shows that the entrepreneur understands how to stimulate and motivate his employees and how to reward them. These are examples of interpersonal competence.

Strategic action competence entails taking action to achieve desired outcomes related to sustainability goals. These actions are generally strategic in nature and show that they require an understanding of which steps to take and whom to involve in order to get certain results related to sustainability issues. The strategic actions made by the entrepreneurs generally show the normative competence as well, because when making these decisions the values and principles of the entrepreneur appear to influence the choices made in these decisions. Strategic action competence is identified 156 times in the interviews. Two examples of strategic action competence are in the following quotes:

"When we were in South-Africa, we discovered the growing need for affordable light. If you make a good product, it is by definition more expensive than a cheap product that lasts less long and which people need to replace often. In the end, the consumer is paying more for the cheaper product. What would be a smart and practical system, since solar energy is free, to let people pay in terms? A microcredit for a reduced price. That is what we do in Rwanda with scratch cards and mobile payments. We will soon start with bank payments that are cheaper than the price people currently pay for the bad light from kerosene and candles. Then it becomes accessible for everyone and it becomes attractive because of the lower price." Entrepreneur 11.

"In our area, houses have been built for people with low incomes. We own the solar panels on the roof and ensure the house is energy positive. Because we are the owner of the solar roof, we can settle the costs via the production of electricity by the solar roof. The only thing that is still missing is energy storage for those moments that a surplus of energy is produced. We are planning to include energy storage in the near future." Entrepreneur 1.

The above quotes show that the entrepreneur takes the initiative to not only make a sustainable product, but also everything around the product needs to be sustainable and affordable. Making these choices is a clear example of strategic action competence. These quotes also show normative competence which is closely related to strategic action competence. A general finding from the interviews is that normative competence and strategic action competence strengthen each other. In the examples where a concession is made on normative competence, strategic action competence is influenced.

There is one example of not using strategic action competence by the sustainable entrepreneur. This example is given in the following quote:

"*We buy the products that are offered by our suppliers. We do not invest in development of more sustainable materials. We leave the development of more sustainable materials with the supplier. They too are motivated to become more sustainable, because they have customers all over the world. If there is more demand for more sustainable materials, they are motivated to change their sourcing and production to make better products. Not just technically better, but also from a societal point of view.*" Entrepreneur 1.

The above quote shows that this entrepreneur chooses not to invest or take action to stimulate his supplier to make more sustainable products. This is an example of not using strategic action competence.

The different competencies have been identified, but there is also some overlap between competencies where two or more competencies are identified in the same situation. Table 7 provides an overview of the number of times different competencies are identified together in the interviews.

Table 7: Overview of competencies that have been identified together.

Competencies	Diversity	Foresighted-thinking	Systems-thinking	Normative	Interpersonal	Strategic action
Diversity	-	8	12	20	11	59
Foresighted thinking	8	-	8	10	1	30
Systems-thinking	12	8	-	31	0	24
Normative	20	10	31	-	3	52
Interpersonal	11	1	0	3	-	4
Strategic action	59	30	24	52	4	-

A noticeable result in table 7 is that the respondents mention elements of interpersonal competence only a few times with other competencies. When the respondents refer to elements of strategic action, they also refer to elements of diversity competence. This occurs 59 times and is relatively frequent compared to other combinations. The combination of strategic action competence and normative competence is also identified relatively frequent, with 52 times. The following quote provides an example of the combination of strategic action competence and diversity competence:

"*In the beginning, I was thinking like an architect and wanted to realise one building with these modules. After a while, I realised I could start my own business. I started talking with people in my network, among which my contractor for my previous assignment. I expanded my network and slowly made progress. In the beginning, I did this aside from my work as an architect, but after some time I joined an accelerator program and that is where it really started to take shape and where I received my first financial resources to start my own business.*" Entrepreneur 8.

In the above quote, the entrepreneur mentions the steps he took to start his own business. This shows the use of strategic action competence. By contacting and expanding his network, the entrepreneur showed the use of diversity competence.

The following quote provides an example of the combination of strategic action competence and normative competence:

"I stopped with the bio-degradable product and started thinking about the corporate social responsibility policy. I had two choices. I would build my own factory or I would use an existing factory with older equipment. Looking at the environmental impact of both choices, I decided not to build a new factory, but to use the existing factory with the older equipment." Entrepreneur 14.

In the above quote, the entrepreneur mentions the choice between a new or existing factory. The entrepreneur chooses the existing factory because it is more sustainable. This shows not only the use of normative competence, but also strategic action competence.

4.2.2 Critical issues
The interview data is also analysed for the six critical issues in venture creation that are identified in chapter 2.3. Table 8 provides an overview of the number of times each critical issue has been identified in the interviews.

Table 8: Overview of critical issues that have been identified in interviews.

Critical issues	Venture creation	Organise team	First funding	Portfolio focus	Technology-market	Business model adaptation
# Identifications	20	33	22	18	15	12

All respondents mentioned the first four critical issues. The last two, namely technology-market and business model adaption were not explicitly referred to by the respondents. The critical issue of "organise team" is identified most often with 33 times. The critical issues of "technology-market matching" and "business model adaptation" are identified least of all. The sample for this study consists mostly of entrepreneurs who are working on a business that exists for less than 7 years and are in the early phase of creating a business. Decisions on portfolio focus and technology-market matching are decisions that occur more often as the business grows, because then the resources enable expansion of the portfolio and target markets. This could also explain the lower number of identifications of business model adaptation, since literature suggests that this critical issue is more important on the long term.

One of the goals of this research was to identify which competencies are used in the different critical issues in venture creation. Table 9 provides an overview of the number of times each competency is identified with each critical issue of venture creation.

Table 9: Overview of identified competencies within each critical issue.

Critical issues / Competencies	Venture creation	Organise team	First funding	Portfolio focus	Technology-market	Business model adaptation
Diversity	7	27	19	3	4	5
Foresighted-thinking	3		3		2	4
Systems-thinking	2	0	0	2	4	1
Normative	8	4	0	4	2	2
Interpersonal	0	2	0	0	0	0
Strategic action	15	7	12	9	10	7

Table 9 shows that different competencies are used with different critical issues. Noticeable is that four out of six critical issues show a relatively frequent use with one or more competences. Diversity competence, as an example, is often within the critical moment of organising a team. Another example is the use of strategic action competence when deciding on portfolio focus. Also noteworthy is the lack of foresighted thinking competence when deciding on the portfolio focus. For each critical issue an example from the interviews is given. These examples include the critical issue and one identified competence with that critical issue, as identified in table 9.

The combination of the critical issue of venture creation and strategic action competence is mostly associated with decisions regarding starting a business and taking the necessary steps to get there. According to the interviews, these decisions are often influenced by the moral values, principles and worldview of the entrepreneur. Two examples of the combination of venture creation and strategic action competence are:

"I did a post-HBO education during my technical education. Then, I realised I wanted to start my own company. More consultancy work. That turned out to be the wrong decision. I then asked myself what I really wanted to do. I started to work for one of the first companies that produces algae. I was project leader for the waste water treatment with algae. In 2012, I left and started my own company. The algae still fascinate me. I saw that having a new product for a new market, even a product that had caused several hypes and would benefit the world, would not be enough. You also need a focus, like 'I want to make the world a better place'. Which steps do you have to take to get somewhere? I started purchasing and selling of algae. That is not sustainable, it is simply buying and selling the product. With that business, I generated information about the market and the product. With the revenue, I could do innovations to eventually do it myself. Now, we are at a point where we are building a demo factory to produce ourselves." Entrepreneur 10.

"My goal is to think different than other entrepreneurs. Cutting costs, making a success story and selling it. That is my goal. That is how I got involved in injection molding. There was a company that had financial trouble and they asked me if I could help. They were working on potato starch for the bio-sector and that made me think. I thought it was not necessary at the time, but I knew that at some point a change was necessary towards sustainability. That is how I got started with the business. What is important? What is causing environmental damage? That is how I got involved in sustainability." Entrepreneur 14.

The above quotes mention the thought process the entrepreneur went through when thinking about starting a company. These are examples of the decisions to start a venture. Thoughts about which steps need to be taken and understanding the market by starting with purchasing and selling are examples of strategic action competence. The second quote also highlights the sustainability aspects that influence the decision to start a business and the decision on what sort of product will be produced and sold.

The combination of the critical issue of organising a team and diversity competence entails the need to involve different disciplines and backgrounds to form a team to work on sustainability issues. Two examples of organise team and diversity competence are:

"Shortly after I started, I realised that I could not do this by myself. In the first few years I had interns to help me, they felt like colleagues to me, but after half a year those interns leave and I was alone again. After one year, I was already looking for a partner and I started a trial with three candidates. With all three candidates, it turned out not to work as well as I hoped and after two years, my husband decided to join the company. Next month a fulltime colleague is joining our team, who is going to focus on sales. […] During the interviews, we asked about sustainability. […] About his background, the choices he made. […] If he made choices that I cannot understand, I am reluctant to hire him. This person turned out to have a lot of experience with sustainability related work at most sustainable organisations in The Netherlands. We started a trial with him for three months, but after three months it turned out that the work did not fit him. He was a great candidate, but we both misjudged the expectations. We focused too much on his experience with sustainability. The person who is joining us next month scored lowest on sustainability, but he excels at his job. In the end, he turned out to have the passion for sustainability, because otherwise you are not going to do this work. We do not have great working conditions and offer minimum wage and uncertainty. In the end, I think it is important to choose someone who is good at his job." Entrepreneur 9.

"My background is architecture. I gathered people with expertise on chemical engineering, chemistry and product development through universities. Soon, someone with a background in civil engineering will join the team too. Later on, two students with a background in construction will join the team and I will have the necessary expertise to develop the product and company." Entrepreneur 2.

The above quotes show the critical issue of organising a team when it is mentioned that a trial with three candidates was started. Diversity competence is included in the realisation that the entrepreneur cannot do this by themselves. Diversity competence is also included in the whole process of finding the right candidate. This process is also a clear example of the process of organising a team.

The combination of the critical issue of finding first funding and diversity competence entails the need to acquire funding through the involvement of stakeholders and other interested parties. Two examples of finding first funding and diversity action competence are:

"Last year I had to secure the funding, which took over a year. That was intense. Back then, it was very important that I talked frequently with stakeholders and other interested parties. A few innovation brokers helped me through this process." Entrepreneur 10.

"We started with Startlife and won a competition to secure an innovation loan. We then did a proof of concept loan and at PPM Oost we also received a loan. At Climate-KIC, we also collected financial resources and in national and international competitions we won finances too. After these rounds of securing funds, we found our first private investor. Sometime later, we found our second investor. Entrepreneur 15.

The above quotes show that entrepreneurs need to secure funding, these are clear examples of finding first funding. Diversity competence is included in this quote in that frequently talking with stakeholders and other interested parties is important to find funding.

The combination of the critical issue of portfolio focus and strategic action competence entails the need to take into account the limitations of supply and demand to understand which products the company can include in its portfolio. Two examples of portfolio focus and strategic action competence are:

"In the beginning we started with suits, t-shirts and jeans. We then decided to focus on suits and circular work clothes. The latter was included during the search for more sustainable materials. Wool is not the most sustainable material. We found a supplier of a Cradle-to-Cradle material, but it is 100% polyester and unfit for making suits. It is very sustainable, but there was no demand. Then, we decided to move to the higher business clientele for the suits and work on closing the circular loop on the working clothes. Since a few months, we also work on recycling of polyester-cotton. So, now we have three products in our portfolio." Entrepreneur 5.

"We have a web shop to make clear what sort of products we make. It is our own collection. When a big company wants a product, they can choose one from the web shop. We can make it specifically for that company. This collection enables us to work efficiently and effectively." Entrepreneur 12.

The above quotes show that entrepreneurs choose which products they focus on. This is an example of portfolio focus. Strategic action competence is present in making the decisions on which products to include in the portfolio and which are not.

The combination of the critical issue of technology-market matching and foresighted thinking competence entails the need for a certain foresight in developments and changes in the environment of the company. Anticipating developments and looking at a longer timescale can help identify a target market for the company's products or technology. An example of technology-market matching and foresighted thinking competence is the following quote:

"It is about positioning the products and brand and the theme of building with waste is new in the construction sector. The construction sector is structured in such a way that you pay me to build a house. I am the builder and responsible for the quality. When I start working with new experimental materials, I increase the risk of problems arising and I do not want that, because it costs me money. So, the construction sector is not motivated to innovate. So, we thought of developing products that have a special colour and texture and different sizes. Then, we automatically end up in the highest segment. The so-called iconic buildings such as expensive apartments, museums and offices. Those are generally designed by architects who are very influential. That means that you trust the architect, because you chose him for his style. And if that architect then chooses to build with this material, it happens. Other, less influential, architects can design a building with special materials, but if the developer decides it is too expensive, other cheaper materials will be chosen." Entrepreneur 17.

"It takes a few years to completely change the production process to sustainable bio-degradable plastics. That has to do with money. In the end, you need to find out if there is a market for these products. How do people react to these products? Our customers are positive, but they are not consumers. Will the end-consumer be happy with this sustainable product that is also cheaper than the competition? If it is not a success, we should not invest in it. This is difficult to foresee, but important to take into account." Entrepreneur 7.

In the first quotes, the entrepreneur shows an understanding of the construction market by explaining how it operates. It also mentions what changes to the product are made to increase the chance of adoption in the market. This is an example of technology-market matching. The second quote shows that the entrepreneur is thinking about this process and adapting the product to ensure adoption. This shows the use of foresighted thinking competence by the entrepreneur.

The combination of the critical issue of business model adaptation and strategic action competence entails the need for action when external forces or business model experiments show a change in business model is necessary for survival or beneficial for economic, environmental or social objectives. An example of business model adaptation and strategic action competence is:

"We see that a subscription based payment method for hardware is still very new. Our current customers think it is very cool, but those are the early adopters. I think the majority of potential customers still thinks it is a bit odd. People say that being stuck to a contract is the biggest barrier for subscriptions. By making the subscription monthly terminable, we lower that barrier." Entrepreneur 3.

"I started with buying and selling of algae. That in itself is not sustainable. You buy the product, change a little and sell it. However, with that business, I gained insight in the market and the product. With the revenue I created, I could innovate to be able to produce it myself. That is how we are now working on a small test factory to scale up our production." Entrepreneur 10.

The first quote mentions lowering barriers for potential customers by making the subscription monthly terminable. This is an example of business model adaptation. Making this decision and understanding the long-term effects is an example of strategic action competence. The second quote shows how the entrepreneur used his business model to work towards a new business model. This is an example of both business model adaptation and strategic action competence.

4.2.3 The mindset of a sustainable entrepreneur

The interviews also provide insight in a concept that is included in strategic action competence and normative competence, but deserves more attention. This concept is the mentality or mindset of sustainable entrepreneurs. The entrepreneurs mention that a regular entrepreneur, who is primarily focused on financial objectives, will not be able to maintain a sustainable business in the long term. This came back in several interviews and is interesting since it indicates that sustainable entrepreneurs need a certain "mind-set" or "mentality" in order to work towards and maintain a sustainable business. An example of an entrepreneur mentioning this is:

"In the end, most 'grey' companies are managed based on financial benchmarks. If you are good at that, you can become a director at any company. However, these companies are all doing the same. There are few companies where it is combined with a lot of creativity. Apple, Nike, and Google are companies that are very financially driven. Those companies continue to take risks by trying new things. That is, for some reason, in their DNA. Google Glass for example, is flopped. That is something that a company like HP will never try. Most companies will not try something like that. That has to do with the atmosphere in the company and the people who manage it. […] You could say that a mentality for sustainability should be a competency, because if you do not have that you will not be a successful sustainable entrepreneur. The consumer should be more critical towards companies and how they do business." Entrepreneur 16.

The above quote shows that a certain mentality is needed to be able to create and, more importantly, continue a sustainable business. This makes the above quote a clear example of the need for a certain mentality to be a successful sustainable entrepreneur. Another entrepreneur gives a strong statement on the impact of her sustainability mindset on her personal life. This statement is provided in the following quote:

"One of my friends from university now works for an oil company and flies around in an airplane in the weekends. I have to say that it does influence the relationship I have with that person. His behaviour makes me feel like my efforts towards a more sustainable society are being undone by his work. It is difficult to maintain that friendship. This difference in each other's world views should not be too great, otherwise I cannot maintain a good relationship." Entrepreneur 9.

The above quote clearly indicates a strong personal connection between the entrepreneur and sustainability. This connection is so strong in fact, that it influences the personal life of the entrepreneur.

Discussion

To answer the main research question, this study used literature, a questionnaire and interviews. The main research question is: What role do competencies of sustainable entrepreneurship have in the decision-making process on critical issues of venture creation? To answer the main research question, two research questions are formulated. These are discussed separately.

The first research question: which competencies do sustainable entrepreneurs use in their business?

To answer this question, first a questionnaire was used as a self-report. The results of the questionnaire show that sustainable entrepreneurs think they possess all six competencies studied in this research. The average score for each competence is 7/10 or higher. However, when looking at the individual scores, it becomes clear that some entrepreneurs score relatively high or low on certain competencies. An explanation for this result could be that the sample of entrepreneurs consists of several entrepreneurs who started their business only two or three years ago. When an entrepreneur has little or no experience or need to use certain competencies, it may result in them thinking they do not fully possess this competence. Based on the results of the questionnaire, it can be concluded that sustainable entrepreneurs think they possess the six competencies for sustainable entrepreneurship. This is a first indicator that sustainable entrepreneurs use the competencies for sustainable entrepreneurship.

Secondly, interviews were used to answer research question 1. The interview data supports the results from the questionnaire as it indicates the use of all six competencies by the sustainable entrepreneurs, but it becomes clear that a high self-report score does not necessarily translate into a strong and clear enactment of those competencies. Some competencies were identified more often than others. Interpersonal competence is identified least with 27 times, whereas the next least identified competence is systems-thinking competence which is identified 61 times. A possible explanation for this difference could be that interpersonal competence is a more generally used competence, whereas the more identified competencies, such as normative competence, are used more specifically by sustainable entrepreneurs. Another explanation is that the focus of the interviews was more towards the sustainability practices of the sustainable entrepreneur and interpersonal competence is perhaps less important in that regard. Also, when asking about elements of interpersonal competence, most entrepreneurs made short and general statements that are less distinguishable as elements of interpersonal competence.

Diversity competence is one of the most identified competencies in this study. The studies of Lans et al. (2014), Wesselink et al. (2014) and Ploum et al. (2017) support this result, but the studies of Hesselbarth & Schaltegger, (2014) and Osagie et al., (2016) did not include diversity competence in their study. Their studies conducted research among CSR-managers and MBA-alumni, but not among sustainable entrepreneurs. The results of this study clearly indicate the need for diversity competence for sustainable entrepreneurs. The sustainable entrepreneurs make it clear in the interviews that sustainability issues cannot be resolved by individuals, but need different disciplines working together. Therefore, it is expected that future studies will include diversity competence when studying professionals in a business context that work on sustainability issues.

Foresighted thinking competence is recognized by other studies as one of the competencies for sustainable entrepreneurship (Rieckmann, 2012; Hesselbarth & Schaltegger, 2014; Osagie et al., 2016; Lans et al., 2014; Ploum et al., 2017). Only the study of Wesselink et al. did not include foresighted thinking competence. Their study was conducted among CSR-managers. Sustainable entrepreneurs need foresighted thinking competence to anticipate developments in the market and to foresee the consequences of actions on longer timescales and in a bigger perspective. Based on these results, foresighted thinking competence is an important competence for professionals in a business context that focus on sustainability. A long-term view is especially important in order to successfully mitigate sustainability issues.

Systems-thinking competence is one of the competencies that is recognized in all four studies on competencies for sustainable development (Hesselbarth & Schaltegger, 2014; Wesselink et al., 2014; Lans et al., 2014; Osagie et al., 2016; Ploum et al., 2017). Since this study also indicates the need for systems-thinking competence, it supports the results of the previous studies on competencies for sustainable development. However, the other studies see systems-thinking competence as a key competence for sustainable development, where the results of this study indicate that systems-thinking competence is less of a key competence than normative competence and strategic action competence. Systems-thinking competence is mostly used to understand sustainability issues and to take all relevant aspects into account when working on a solution. Especially for sustainable entrepreneurs, since they combine economic, social and environmental objectives, systems-thinking competence enables a complete understanding of the sustainability issue. This allows the sustainable entrepreneur to better balance the economic, social and environmental objectives.

Normative competence is one of the most identified competencies in this study. This result could have been influenced by the selection of the sample. In this study, the entrepreneurs are preselected on their sustainable practice which could result in them being more ethical than conventional entrepreneurs or managers. This can result in a more frequent use of normative competence. Normative competence is included in three of the four other studies (Hesselbarth & Schaltegger, (2014); Osagie et al., (2016); Lans et al., 2014; Ploum et al., 2017), but not in the study of Wesselink et al. (2014). In general, normative competence plays an important role in the decisions a sustainable entrepreneur makes and the reason why the entrepreneur chose to create a venture. In a few cases, the entrepreneurs mentioned that the decision to start a venture was based on economic motives and environmental and social motives did not play a role. However, each of these entrepreneurs said that, once they started their business, social and environmental motives became increasingly important. This development is not only identified with entrepreneurs who started with environmentally friendly motives, but also with entrepreneurs who saw an economic opportunity to start a business. All entrepreneurs mentioned this transition towards a sincere focus on environmental and social aspects and less focus on maximising profitability. In some cases, the entrepreneurs provided an example of behaviour that could be seen as making concessions of normative competence. This result shows that sustainable entrepreneurs are not always more sustainable than conventional entrepreneurs. Sustainability sometimes loses out to profitability, especially in the early stages of the business because then the continuation of the company is less certain. In the end, sustainable entrepreneurs, like conventional entrepreneurs, need to make a profit to continue and grow their company. A sustainable business is still a business and not a charity. Normative competence is one of the key competencies for sustainable entrepreneurs. According to the sustainable entrepreneurs, sustainable businesses cannot be managed by people who lack normative competence.

Interpersonal competence is included in all four studies on competencies for sustainable development (Hesselbarth & Schaltegger, 2014; Wesselink et al., 2014; Lans et al., 2014; Osagie et al., 2016; Ploum et al., 2017). In this study, interpersonal competence is identified least of all competencies. This is surprising, since interpersonal competence is thought to be needed together with diversity competence. Looking back at the transcripts of the interviews, each entrepreneur was asked about elements of interpersonal competence, therefore that does not offer a reasonable explanation for this outcome. An explanation for this result could be that half of the sample of entrepreneurs have fewer than three employees and fewer employees means less situations where interpersonal competence could be used. Another explanation is that unintentionally, the interviews focused more on the other competencies and less on interpersonal competence. From the statements on interpersonal competence, it is clear that having a good relationship with colleagues and other stakeholders comes naturally and is seen as self-evident.

Strategic action competence is included in all four studies on competencies for sustainable development (Hesselbarth & Schaltegger, 2014; Wesselink et al., 2014; Lans et al., 2014; Osagie et al., 2016; Ploum et al., 2017). Strategic action competence is a combination of action competence and strategic management competence (Ploum et al., 2017). Action competence is recognized in literature as one of the most important competencies (De Haan, 2006; Ellis & Weekes, 2008; Blok et al., 2016). The interview results show that both "strategic management" and "action" are important for sustainable entrepreneurs to work on sustainability issues. Actions of entrepreneurs can be simple and short-term, but actions can also be strategic, long-term with a significant impact on the company's future. The interviews provide insight in the relationship between strategic action competence and normative competence. A general finding is that normative competence affects the use of strategic action competence.

The competencies for sustainable development are not completely unrelated to each other as they form an integrated framework (Lans et al., 2014; Ploum et al., 2017). Looking at the results, two distinct combinations of competencies are identified. The first combination of competencies is strategic action competence and diversity competence. This result indicates the need to involve stakeholders and different disciplines to take action and to make strategic decisions. This supports the notion that sustainable entrepreneurs cannot work on sustainability issues by themselves. They need different disciplines and the ability to find and combine these different disciplines to successfully work on sustainability issues. According to Neck et al. (24), the creation of a team and the gathering of resources usually occurs before the actual decision to start a venture. This can also explain why diversity competence is frequently identified together with strategic action competence because the creation of a team often occurs simultaneously or in shortly before the venture is created.

The second combination of competencies that is identified relatively frequent is strategic action competence and normative competence. Both competencies can be considered as moral competencies (Blok et al., 2016). They include norms, values and principles that define right and wrong regarding sustainability. This could explain why these competencies have been frequently identified together. This combination indicates that sustainable entrepreneurs differ from conventional entrepreneurs in such a way that personal values and principles, regarding sustainability, influence the decision-making of sustainable entrepreneurs. This influence is identified in the interviews as sustainable entrepreneurs that choose the more sustainable options over the less sustainable options,

even though they are not required to do so. This is a clear sign that the normative competence plays a major role in the decision making of sustainable entrepreneurs. It also acts as a sign that normative competence may be the most important competence for explaining the differences between conventional and sustainable entrepreneurs.

To answer the first research question, it can be concluded that all six competencies play a role in the work context of sustainable entrepreneurs. The interviews indicate a clear use of moral elements from both strategic action competence and normative competence as a key aspect of what makes sustainable entrepreneurs different from conventional entrepreneurs.

The second research question: Which competencies do sustainable entrepreneurs use in the strategic decision-making on critical issues of the venture creation process?
To answer this question, critical issues of the venture creation process were identified in the interviews. Before the results are discussed, the process of including the critical issues of venture creation needs to be explained. The critical issues were included later on in the research process, after a number of interviews were already conducted. Since the critical issues were already present in the interviews on a more abstract level, it was expected that including them later on would not result in differences in the interviews. After the decision was made to include the critical issues, the first three interviews were compared to earlier interviews to check for differences on how the critical issues were included. There were no clear differences found. This is probably due to not asking directly about these critical issues, but already having included them in the pre-determined questions of the interview guide.

Not all critical issues could be identified in each interview. An explanation for this result is that depending on the entrepreneur, some critical issues may not have occurred yet. For example, business model adaptation is generally more likely to occur when the company exists for a longer period and developments in the environment force the entrepreneur to adapt in order to be successful. Since the sample of entrepreneurs has been selected with a preference for businesses that exist for seven years or less, the critical issue of business model adaptation occurs less often in this sample. For each critical issue, there are one or two competencies that are identified most frequent. These competencies are discussed per critical issue.

The critical issue of venture creation is identified most frequently with strategic action competence. The commitment to physical creation of a venture marks a distinction between the invisible process of thinking about creating a venture and the visible process of actually creating the venture (Bhave, 1994). Therefore, when starting a venture, the most important part of strategic action competence is the 'taking action' part. The sustainable entrepreneur needs to generate venture ideas and translate these ideas into actionable terms as a set of immediate goals and actions (Munoz & Dimov, 2014). This is the invisible process. Taking the necessary actions to achieve the goals is the visible process. These steps ask for strategic action competence. However, in strategic action competence are also moral elements included that are identified in the data. Moreover, normative competence is the second most identified competence with the critical issue of venture creation. The normative and moral elements of both competencies play an important role in the motives of sustainable entrepreneurs to start a venture.

Therefore, the following proposition is made: strategic action competence together with normative competence are most important for making the decision to start a business.

The critical issue of organising a team is identified most frequently with diversity competence. When organising a team, it is important to involve people with different disciplines to work on a sustainability issue. This explains the need for diversity competence. However, it was expected that interpersonal competence would also be needed when organising a team, but the results do not support this. A possible explanation could be that during the interviews the focus was more on why and who is needed to complete the team, rather than what happens when someone does not fit in the team. The two times that interpersonal competence is identified with organising a team, are about finding the right candidate who does not only fit the requirements of the job but also fits the team on a personal level.

Therefore, the following proposition is made: diversity competence is most important for organising a team.

The critical issue of first funding is identified most frequently with diversity competence, but also with strategic action competence. Sustainable entrepreneurs need to involve stakeholders and other parties to secure the necessary funding (Baron, 2007), this explains the need for diversity competence. Entrepreneurs need to take the appropriate action to find investors and to make strategic, or long-term, agreements for investments in the company. Not only for the money, but also for experience, know-how, networks and wisdom (Timmons & Spinelli, 2008). This explains the need for strategic action competence. For sustainable entrepreneurs, both "taking action" and "strategic management" are important to include in finding first funding. Sustainable entrepreneurs do not only need to find funding, they also need to ensure that the conditions for the funding conform to the needs of the company at that moment and in the near future. According to Baron (2007), Baron & Markman (2003) and Baron & Tang (2009), social skills and social networks explain why some entrepreneur are better than others in securing funding. However, in this study interpersonal competence is not identified with finding first funding. There is, however, an example of where an adviser to one of the entrepreneurs shows social skills in order to secure funding. The entrepreneur explained that this display of social skills helped significantly with securing that first funding.

Therefore, the following proposition is made: both diversity competence and strategic action competence play an important role in finding first funding.

The critical issue of portfolio focus is identified most frequently with strategic action competence. An explanation for this result is that decisions on portfolio focus are generally strategic in nature and impact the company on the long-term. The critical issue of portfolio focus is not identified as often as the previously discussed critical issues. This can be explained by the young age of most of the companies in the sample. It is generally accepted that young companies should focus on a single product and make that significantly better than the competition. Limited resources play a role in this decision.

Therefore, the following proposition is made: strategic action competence is most important when choosing the portfolio focus of the company.

The critical issue of technology-market is identified most frequently with strategic action competence, but foresighted thinking competence is also important according to the sustainable entrepreneurs. Technology-market matching is about recognizing and prioritizing technology solutions for a specific market application or finding the appropriate market for a technology (Maine et al., 2014). Elements of foresighted thinking competence are used by the entrepreneurs to foresee which markets may be interested in the product or technology. Strategic action competence is used to take the necessary steps to position the product such that the anticipated markets are reachable or to work on a technological solution or product for an identified market application.

Therefore, the following proposition is made: both strategic action competence and foresighted thinking competence are most important when matching technologies and products to markets.

The critical issue of business model adaptation is identified most frequently with strategic action competence, but here the difference between the number of times it is identified with each competence is smaller. The reason for strategic action competence being identified most is because adapting the business model requires taking action in a strategic manner (Chesborough, 2010), since it impacts the entire company and its future. Other competencies are also identified relatively frequent compared to strategic action competence. Diversity competence could be needed in order to involve and combine different disciplines to come to the right decision on adapting the business model. Foresighted thinking competence is also mentioned with business model adaptation. Changing the business model can be pro-active or reactive. In the case of pro-active adaptation, foresighted thinking competence can help foresee developments and enable the entrepreneur to anticipate these developments.

Therefore, the following proposition is made: strategic action competence is most important when adapting the business model.

A last note on competencies identified with critical issues of the venture creation process, is interpersonal competence. Interpersonal competence is only identified twice and only with the critical issue of organising a team. An explanation for this result is that when organising a team, different people with different backgrounds need to work together. Having good relationships between these people is important for the success of the company. An explanation for this result could be that this study focused on why entrepreneurs made the decisions they made on the critical issues and not necessarily on how that decision was made within the company.

To answer the second research question, it can be concluded that each critical issue has one or more competencies that are clearly more important than the other competencies. The only competence that does not play an important role for any critical issue, is interpersonal competence.

The last point up for discussion is the so-called mind-set of the sustainable entrepreneur. A key distinction between conventional and sustainable entrepreneurs is how they balance economic, social and environmental objectives. From the interviews, it becomes clear that sustainable entrepreneurs are willing to sacrifice economic objectives in favour of social and environmental objectives. Sustainable entrepreneurs think that it takes a certain mind-set to be able to run a sustainable business in the long run. This mind-set in, favour of sustainability, can be so strong that it affects the personal relationship between the entrepreneur and his or her friends. This mind-set can be very strong according to the entrepreneurs. This could have implications for sustainable development. How can companies be expected to become more sustainable when it asks for such a strong mind-set? This mind-set could explain why so many companies have difficulties with disruptive developments in the sustainable development such as electric cars. Education could support sustainable development by incorporating this mind-set in their study programs

Limitations and future research
A limitation of this research is the sample size. This study conducted interviews with 18 entrepreneurs, and even though they have been chosen based on specific criteria, this sample size is limiting the ability to generalize the findings of this study. Another limitation of this study is the age of the ventures included in this sample. Most ventures exist for less than seven years, which begs the question if entrepreneurs with older ventures need the same competencies. A second limitation of this study is the recall, or response, bias that could impact the validity of the questionnaire and interviews. The respondents may exhibit a social desirability bias during the interviews. This is a difficult bias to minimize and this study took the following precautions. The questionnaire was self-administered, so the entrepreneurs opened the questionnaire themselves via internet and answered it in their own time. The interview questions were pre-recorded in order to make them neutral and support a neutral interview. Another way of combatting the response bias was to ask for examples that show whether the entrepreneur used a certain competence. The interviews also offered the opportunity to ask follow-up questions to clarify statements of the entrepreneurs and to ask for the same competence in different ways to minimize misunderstanding.

Future research could look at interpersonal competence and its role within the entrepreneurial process of venture creation. This study could not identify a clear use of interpersonal competence in any of the critical issues of the venture creation process. However, it is reasonable to assume that interpersonal competence plays a role in different activities of an entrepreneur. Finding funding and organising a team are examples where interpersonal competence could have a real use in helping the entrepreneur become successful. Future research could also study a larger sample of sustainable entrepreneurs and look into possible differences of the use of competencies by sustainable entrepreneurs in ventures that are in a more mature stage of development. Future research could also look into the mind-set of the sustainable entrepreneur and how future entrepreneurs could be supported in getting the mind-set needed to be a successful sustainable entrepreneur.

Conclusion

This research is the first to study competencies for sustainable development with sustainable entrepreneurs as research subjects. Therefore, this study complements the existing literature on competencies for sustainable development by providing insights in the competencies that are used by sustainable entrepreneurs. Moreover, the results provide insight in the importance of the different competencies on critical issues of the entrepreneurial process of venture creation. These insights can help entrepreneurship education to include these competencies in order to support the development of successful entrepreneurs.

The main research question is: What role do competencies of sustainable entrepreneurship have in the decision-making process on critical issues of venture creation? The data of the questionnaire indicates that sustainable entrepreneur think they possess all six competencies of sustainable entrepreneurship. The interviews show that sustainable entrepreneurs not only think they possess all six competencies, but that they actually use them in their entrepreneurial work context. Strategic action competence and normative competence are mostly used to decide to start a business and make it sustainable. Diversity competence is mainly used to find and combine different disciplines needed to work on a sustainability issue. Foresighted thinking competence is mostly used to anticipate developments in the market and to foresee the consequences of actions on a longer timescale. Systems-thinking competence is mostly used to understand all aspects relevant for the sustainability issue that is being worked on. It is less of a key competence for sustainable entrepreneurs than strategic action competence and normative competence. Interpersonal competence seen as a skill that comes naturally and is mostly used to maintain relationships between employees and other stakeholders.

The interview data shows a clear balancing of economic, social and environmental objectives by the sustainable entrepreneurs, but with the condition that the financial health of the company is in good condition. Sustainable entrepreneurs are also willing to sacrifice financial gain over environmental or social objectives, but with the same condition of a good financial health of the company. The interview data also shows that each critical issue in the venture creation process has one or two competencies that are most used by the sustainable entrepreneur. An overview is provided in table 10.

Table 10: Overview of most important competences per critical issue of venture creation.

Most important competence	Strategic action competence	Diversity competence	Normative competence	Foresighted competence	Systems-thinking competence	Interpersonal competence
Venture creation	�"		▓			
Organising a team		▓				
Accessing first funding	▓	▓				
Portfolio focus	▓					
Technology-market matching	▓			▓		
Business model adaptation	▓					

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Appendix 1: Operationalisation of concepts

Personal value, motivation and action: strategic action competence

This theme consists of the strategic action competence and the normative competence. First the strategic action competence is operationalised, then the normative competence is operationalised.

Strategic action competence

Strategic action competence is described to the respondent as: "*I realise that in the end, dealing effectively with sustainability issues also requires taking action and initiative. I realise that working on sustainability related issues involves the design and implementation of my intervention. More specifically it involves arranging tasks, people and other resources, inspiring and motivating others and an evaluation of my project*".

The following items from the questionnaire are used to measure the strategic action competence of the respondent: When it comes to achieving particular goals in relation to sustainability I know whom to involve - If I want to reach goals in relation to sustainability, I know which steps should be taken to be successful - I am able to use a strategic way of working in sustainability related projects (designing, testing, implementing, evaluating - I am able to monitor the sustainability performance of a company - I challenge not sustainable ways of working in a company - I am very good at identifying opportunities for sustainable development - I know how social, environmental or societal challenges can be turned into opportunities for an organization/company - I am able to motivate higher management in a company to invest in sustainability.

Normative competence

Normative competence is described to the respondent as: "*I understand that sustainability issues are surrounded with lack of clarity. I know what trustworthy sources are and realise that facts and figures need translation to my own practice, because they cannot be applied on a one-to-one basis. The decisions I make or the initiatives I take are based on these insights*".

The following items from the questionnaire are used to measure normative competence: I am willing to take initiative to make improvements in my own practice based on norms, values, targets and principles of sustainability - I know what is seen as 'good sustainable practice' in my field of study - I am able to apply norms, values, targets and principles of sustainability to my own practice - I know how to explain the decisions a company has made concerning sustainability.

Since strategic action competence and normative competence are combined in one theme, one set of questions for the interview has been made. Recurring concepts in the descriptions of both strategic action competence, normative competence and their respective items are: personal values and taking action. In addition, it is about the personal values of sustainability that form the motivation to take action (Ploum et al., 2016; Horlings, 2015) on sustainability issues in a way that fits with the principles of sustainability of the entrepreneur (Wiek et al., 2011; Blok et al. 2015). Long-term commitment towards sustainable development comes from choices people make and the motivations, convictions and intentions people have (Horlings, 2015). Values and the way values are used, determine if sustainable development becomes reality or whether it stays a dream (Horlings, 2015). Values are described as principles, motivations and intentions that support and guide the selection and prioritization of people's actions (Horlings, 2015). By focusing on the personal values, motivation and

actions of the entrepreneur, insight can be gained in the use of strategic action competence and normative competence in the entrepreneurial process of venture creation.

A general question that covers the broader concept of personal values, motivation and taking action entails: How did you come up with the idea for your company and, why and how did you choose to start your own company? More specific questions that can be asked as a follow-up are: How do you deal with investors who are only interested in making money? How important is sustainability when looking for new colleagues? Would you give up the sustainable aspects of your company to make more money? How do you promote sustainability in the workplace?

Diversity competence

Diversity competence is described to the respondent as: *"I realise that sustainability issues are per definition issues that concern more disciplines (e.g. maths, biology, science, social science) to solve the problem or minimize the impact of the problem. I cannot solve challenges such as energy saving, waste management, labour conditions or reducing carbon footprints on my own.".*

The following items from the questionnaire are used to measure diversity competence of the respondent: I am able to bring together economic, social and environmental conflicts of interest - I use the experiences, activities and values of various relevant stakeholders in addressing sustainability issues - I am able to actively involve stakeholders and experts from other disciplines in addressing sustainability issues - I am able to explain the importance of involving local stakeholders (e.g. in recruitment) for a company.

A recurring word in the descriptions and items is stakeholders. A stakeholder is defined as: "any group or individual who can affect or is affected" (Freeman, 2010, p5). Collaboration, interaction, effective communication, partnering, and building relationships with stakeholders are considered important practices for businesses (Abuzeinab & Arif, 2014).

In addition, diversity competence is about the integration of different disciplines and knowing that you cannot solve sustainability challenges alone (De Haan, 2006; Ellis & Weekes, 2008). By focusing on the stakeholder engagement of the entrepreneur, insight can be gained in the use of diversity competence in the entrepreneurial process of venture creation.

A general question that covers the broader concept of stakeholder engagement entails: Could you give an example of how you involved stakeholders in your business and what effect their involvement had on your decision making? More specific questions that can be asked as a follow-up are: Have you involved your stakeholders in addressing sustainability issues and if so, how did that work out? How do you decide what to do when stakeholders have different ideas/preferences? Do you try to find out to what extent stakeholders are willing to work with you and if so, how?

Systems thinking competence

Systems thinking competence is explained to the respondents as: *"In my daily routines, I apply a systems-thinking approach, meaning that before I start working on a sustainability issue I first identify the system(s) it may concern by examining the linkages and interactions between the elements that compose the system".*

The following items from the questionnaire are used to measure foresighted thinking competence of the respondent: I am able to identify key aspects of production chains and agricultural eco-systems - I am able to identify the key operations of a company that have a negative impact on the environment or society - I am able to analyse strengths and

weaknesses of production chains and propose improvements to reduce the negative effects on the environment or society - I am able to integrate social, environmental and societal issues into future plans of a company - I am able to construct and consider different directions for sustainability in the future.

A recurring concept in the descriptions and items is systems thinking. Systems thinking is about understanding the complexity of economic, social and ecological systems (Holling, 2001). In addition, it is about identifying and understanding all (sub)systems that are relevant for the business and how their interdependency affects them (Wiek et al., 2011). By focusing on the systems thinking of the entrepreneur, insight can be gained in the use of systems thinking in the entrepreneurial process of venture creation.

A general question that covers the broader concept of systems thinking entails: Can you explain how you approached the sustainability issue that your company is working on? More specific questions that can be asked as a follow-up are: Do you look for opportunities in the production chain to lessen the environmental impact and if so, how do you use those opportunities? How do you work towards an understanding and a solution for a sustainability issue?

Foresighted thinking competence

Foresighted thinking competence is explained to the respondents as: *"I realise that dealing with sustainability issues in my job means that I have to be able to deal with uncertainty, that I can make future prognoses, and that I am aware of others' expectations and am able to make, and when necessary change, plans".*

The following items from the questionnaire are used to measure foresighted thinking competence of the respondent: I am able to identify risks and opportunities inherent in present and future developments - In analysing and evaluating scenarios for action, I take the impact on the short as well as the long term into consideration - In analysing and evaluating scenarios for action, I take both the impact on the local and the global scale into consideration.

A recurring concept in the descriptions and items is risk and uncertainty. In addition, it is about the ability to create an understanding of the long-term future, based on the evaluation and consideration of local and/or short term decisions on sustainability (Wiek et al., 2011). By focusing on how the entrepreneur deals with risk and uncertainty, insight can be gained in the use of foresighted thinking in the entrepreneurial process of venture creation.

A general question that covers the broader concept of risk and uncertainty entails: How do you deal with uncertainty and risk of your business and did that change over time? More specific questions that can be asked as a follow-up are: How did you identify the risks to your business? Do you include local and/or global impacts of your business in your decision-making and if so, how?

Interpersonal competence

Interpersonal competence is described to the respondent as: *"I see that working on complex issues like sustainability is in most cases not something you do alone, it demands working with people who have very different backgrounds (e.g. entrepreneurs, government officials, activists, scientists)".*

The following items from the questionnaire are used to measure interpersonal competence of the respondent: I am patient and sensitive to someone who "lets off steam"

in complex issues - In a personal conflict, I am able to take the others' perspective and really understand his or her point of view - I am able to feel to what extent stakeholders are willing to cooperate in a project.

A recurring concept in the descriptions and items is communication. In addition, it is about the ability to use communicational and social skills to initiate and support sustainability activities (De Haan, 2006; Wiek et al., 2011). By focusing on communication and social skills of the entrepreneur, insight can be gained in the use of interpersonal competence in the entrepreneurial process of venture creation.

A general question that covers the broader concept of communication entails: How do you motivate and communicate with people you work with, knowing that sustainability demands a lot of discussion because of its many definitions? More specific question for the concept of communication can be: How do you communicate your sustainability ideas to people you work with? - How would you convince people to collaborate with you to work towards your sustainability goals?

The six critical issues in decision-making are operationalised in order to be able to identify them in the interview data.

Organise team (Maine et al., 2015; Carter & Gartner, 1996; Kickul et al., 2006; Baron, 2007; Timmons & Spinelli, 2008)
Description: The steps taken to create and organise a team of people working for the venture created by the entrepreneur.
Indicators: attracting people with complementary talents (Timmons & Spinelli, 2008).
Questions in the interview that relate to organise team: How important is sustainability when looking for new colleagues? How do you motivate and communicate with people you work with, knowing that sustainability demands a lot of discussion because of its many definitions? How do you communicate your sustainability ideas to people you work with? - How would you convince people to collaborate with you to work towards your sustainability goals?

New venture creation (Maine et al., 2015)
Description: The organisational process of establishing a new organisation (Weick, 1979). Risk perceptions (Robinson & Marino, 2015) and motivation (Barba-Sanchez & Atienza-Sahuquillo, 2012) influence new venture creation decisions.
Indicators: Establishing an independent entity (Gartner, 1985), establishing a business
Questions in the interview that relate to new venture creation: Why and how did you choose to start your own company? How did you identify the risks to your business?

Accessing first funding (Maine et al., 2015; Carter & Gartner, 1996; Kickul et al., 2006; Baron, 2007; Timmons & Spinelli, 2008)
Description: The first external funding to create and start the venture.
Indicators: Investors, venture capitalists, banks
Questions in the interview that relate to accessing first funding: How do you deal with investors who are only interested in making money? How would you convince people to collaborate with you to work towards your sustainability goals? How did you secure the first funding for your business?

Technology-market matching (Maine et al., 2015; Maine & Garnsey, 2006)

Description: Technology-market matching is adjusting the technology of the venture to the market demand reachable for the venture.

Indicators: Changing product technology or products, changes in market demand

Questions in the interview that relate to technology-market matching: How did you come up with the idea for your company? How do you work towards an understanding and a solution for a sustainability issue?

Deciding on portfolio focus (Maine et al., 2015; Maine et al., 2013; Parry 2012; Maine, 2012)

Description: Deciding on the range of products that are produced and sold to one or more markets.

Indicators: Entrepreneurs can choose between a narrow range, a broad range or a single market application for their products (Maine & Garnsey, 2006; Maine et al., 2012).

There are no questions in the interview aimed at portfolio focus however, this critical issue does come up frequently in the interviews.

Business model adaptation (Maine et al., 2015; Parry, 2012)

Description: Changing the business model based on experiments with business model innovation and/or external forces.

Indicators: value proposition (value for customer), value creation and delivery, and value capture (revenue) (Teece, 2010).

Questions in the interview that relate to business model adaptation: Could you give an example of how you involved stakeholders in your business and what effect their involvement had on your decision making? Do you include local and/or global impacts of your business in your decision-making and if so, how?

Appendix 2: Questionnaire

1.   Diversity competence

"I realise that sustainability issues are per definition issues that concern more disciplines (e.g. maths, biology, science, social science) to solve the problem or minimize the impact of the problem. I cannot solve challenges such as energy saving, waste management, labour conditions or reducing carbon footprints on my own."

a. I am able to bring together economic, social and environmental conflicts of interest

b. I use the experiences, activities and values of various relevant stakeholders in addressing sustainability issues

c. I am able to actively involve stakeholders and experts from other disciplines in addressing sustainability issues

d. I am able to explain the importance of involving local stakeholders (e.g. in recruitment) for a company

2.   Foresighted thinking competence

"I realise that dealing with sustainability issues in my future job means that I have to be able to deal with uncertainty, that I can make future prognoses, and that I am aware of others' expectations and am able to make, and when necessary change, plans. "

a. I am able to identify risks and opportunities inherent in present and future developments

b. In analysing and evaluating scenarios for action, I take the impact on the short as well as the long term into consideration

c. In analysing and evaluating scenarios for action, I take both the impact on the local and the global scale into consideration

3.   Systems thinking competence

"In my daily routines I apply a systems-thinking approach, meaning that before I start working on a sustainability issue I first identify the system(s) it may concern by examining the linkages and interactions between the elements that compose the system."

a. I am able to identify key aspects of production chains and agricultural eco-systems

b. I am able to identify the key operations of a company that have a negative impact on the environment or society

c. I am able to analyse strengths and weaknesses of production chains and propose improvements to reduce the negative effects on the environment or society

d. I am able to integrate social, environmental and societal issues into future plans of a company

e. I am able to construct and consider different directions for sustainability in the future `[▼]`

4. Normative competence

"I understand that sustainability issues are surrounded with lack of clarity. I know what trustworthy sources are and realise that facts and figures need translation to my own practice, because they cannot be applied on a one-to-one basis. The decisions I make or the initiatives I take are based on these insights."

a. I am willing to take initiative to make improvements in my own practice based on norms, values, targets and principles of sustainability `[▼]`

b. I know what is seen as 'good sustainable practice' in my field of study `[▼]`

c. I am able to apply norms, values, targets and principles of sustainability to my own practice `[▼]`

d. I know how to explain the decisions a company has made concerning sustainability `[▼]`

6. Interpersonal competence

"I see that working on complex issues like sustainability is in most cases not something you do alone, it demands working with people who have very different backgrounds (e.g. entrepreneurs, government officials, activists, scientists)."

a. I am patient and sensitive to someone who "lets off steam" in complex issues `[▼]`

b. In a personal conflict, I am able to take the others' perspective and really understand his or her point of view `[▼]`

c. I am able to feel to what extent stakeholders are willing to cooperate in a project `[▼]`

7. Strategic action competence

"I realise that in the end, dealing effectively with sustainability issues also requires taking action and initiative. I realise that working on sustainability related issues involves the design and implementation of my intervention. More specifically it involves arranging tasks, people and other resources, inspiring and motivating others and an evaluation of my project."

a. When it comes to achieving particular goals in relation to sustainability I know whom to involve `[▼]`

b. If I want to reach goals in relation to sustainability, I know which steps should be taken to be successful `[▼]`

c. I am able to use a strategic way of working in sustainability related projects (designing, testing, implementing, evaluating) `[▼]`

d. I am able to monitor the sustainability performance of a company `[▼]`

e. I challenge not sustainable ways of working in a company ▾

f. I am very good at identifying opportunities for sustainable development ▾

g. I know how social, environmental or societal challenges can be turned into opportunities for an organization/company ▾

h. I am able to motivate higher management in a company to invest in sustainability ▾

Appendix 3: Interview guide

Interview guide Competencies of sustainable entrepreneurs
This interview guide explains the role of the questionnaire and the interview. First the questionnaire is explained and how it will provide input for the interview. The second part of this interview guide is an overview of the different themes and competencies used in the study and the corresponding questions of the interview. The third and last part provides a step-by-step plan to structure the interview and support a complete data collection.

Part 1: Questionnaire as input for the interview
Before the interview the closed-ended questionnaire will be sent to the sustainable entrepreneur. The questionnaire is also used in the study of Ploum et al. (2016) where would-be entrepreneurs (students) are the research subjects. In this study, the research subjects are sustainable entrepreneurs and the questionnaire will be adapted to fit the target audience. An example of these changes is that the questionnaire mentions "my future job" in the explanation of a competence to the entrepreneur. This will be changed into "current job". The questionnaire asks the entrepreneurs to rate themselves on a scale from 1 (low) to 10 (high) on how they perform in different tasks. The questionnaire will be sent by e-mail to the entrepreneur a few days before the interview. The answers of the questionnaire will be used to prepare the interview and to check for salient results to discuss during the interview. The relevance and importance of a better understanding of the competencies of sustainable entrepreneurs will be explained to the entrepreneurs, so they understand why this research is being conducted. A better understanding can help fill in a knowledge gap and indirectly it will support a transition to a more sustainable world.

The entrepreneurs are instructed on the questionnaire and interview and the emphasis will be on giving honest answers. There are no "right" or "wrong" answers. The aim of the study is not to check how sustainable the entrepreneurs are, but what sustainable entrepreneurs do and how they balance people, planet and profit. All data will be anonymous and personal data will be confidential. The interview will be recorded to ensure all answers are correctly transcribed. The questionnaire should take no more than 10 minutes. Once the questionnaire has been filled, the interview can start. The interview will start with a few general questions for each competence in the questionnaire. The answers given in the questionnaire will be the starting point. Depending on the answers in the interview, follow-up questions will be asked to further develop an understanding of the competences and their influence on the decision-making process. The focus of the interview will be on asking for examples of behavior that show the competencies of the questionnaire. The interview will end by thanking the entrepreneur for his time and input. The entrepreneur will also be asked if he/she wants to receive the final report once the results are in. The next section will discuss the different themes and competencies of the interview.

Part 2: Themes and competencies

Theme 1: Personal values, motivation and action
This theme is based on normative competence and strategic action competence. Normative competence is described in literature as: *"the ability to map, apply and reconcile sustainability values, principles and targets with internal and external stakeholders, without embracing any given norm but based on the good character of the one who is involved in sustainability issues (Wiek et al., 2011; Blok et al. 2015)".* Strategic action competence is described in literature as: *"the ability to arrange tasks, people and other resources, inspiring and motivating others, evaluating projects and taking action and initiative to effectively deal with sustainability issues (Ploum et al., 2016)".*

In the closed ended questionnaire, normative competence is explained to the respondents as: *"I understand that sustainability issues are surrounded with lack of clarity. I know what trustworthy sources are and realise that facts and figures need translation to my own practice, because they cannot be applied on a one-to-one basis. The decisions I make or the initiatives I take are based on these insights".* The strategic action competence is explained as: *"I realise that in the end, dealing effectively with sustainability issues also requires taking action and initiative. I realise that working on sustainability related issues involves the design and implementation of my intervention. More specifically it involves arranging tasks, people and other resources, inspiring and motivating others and an evaluation of my project".* The following items from the questionnaire are used to measure normative competence:
- I am willing to take initiative to make improvements in my own practice based on norms, values, targets and principles of sustainability
- I know what is seen as 'good sustainable practice' in my field of study
- I am able to apply norms, values, targets and principles of sustainability to my own practice
- I know how to explain the decisions a company has made concerning sustainability

The following items from the questionnaire are used to measure strategic action competence of the respondent:
- When it comes to achieving particular goals in relation to sustainability I know whom to involve
- If I want to reach goals in relation to sustainability, I know which steps should be taken to be successful
- I am able to use a strategic way of working in sustainability related projects (designing, testing, implementing, evaluating)
- I am able to monitor the sustainability performance of a company
- I challenge not sustainable ways of working in a company
- I am very good at identifying opportunities for sustainable development
- I know how social, environmental or societal challenges can be turned into opportunities for an organization/company
- I am able to motivate higher management in a company to invest in sustainability

Recurring concepts in the descriptions and items are personal values and taking action. In addition, it is about the personal values of sustainability that form the motivation to take

action on sustainability issues in a way that fits with the principles of sustainability of the entrepreneur.

By focusing on the personal values, motivation and action of the entrepreneur, we can get an understanding of how the sustainable entrepreneur uses the normative competence and strategic action competence in the entrepreneurial process. A general question that covers the broader concept of personal values, motivation and taking action entails:
- What were your norms and values when you started, did they change over time and if so, why?

More specific questions that can be asked as a follow-up are:
- Did you convert your norms and values into actions and if so, how?
- Do your norms and values of sustainability impact your personal life and if so, how?
- What would you consider to be good sustainable practice in your business?
- What would you do if an investor is willing to give you enough money to expand and secure your business for the next few (5?) years, but demands that you only do the absolute minimum for sustainability? Where do you draw the line?

Theme 2: Stakeholders
This theme is based on diversity competence. Diversity competence is described in literature as: *"Embracing diversity and interdisciplinarity is the ability to structure relations, spot issues and recognize the legitimacy of other viewpoints in business decision-making processes regarding environmental, social and economic issues, to involve all stakeholders and to maximize the exchange of ideas and learning across different groups (inside and outside the organization) and different disciplines (interdisciplinarity) (De Haan, 2006; Ellis & Weekes, 2008)".*

In the closed ended questionnaire, diversity competence is explained to the respondents as: *"I realise that sustainability issues are per definition issues that concern more disciplines (e.g. math, biology, science, social science) to solve the problem or minimize the impact of the problem. I cannot solve challenges such as energy saving, waste management, labour conditions or reducing carbon footprints on my own.".* The following items from the questionnaire are used to measure diversity competence of the respondent:
- I am able to bring together economic, social and environmental conflicts of interest
- I use the experiences, activities and values of various relevant stakeholders in addressing sustainability issues
- I am able to actively involve stakeholders and experts from other disciplines in addressing sustainability issues
- I am able to explain the importance of involving local stakeholders (e.g. in recruitment) for a company

A recurring word in the descriptions and items is stakeholders. In addition, it is about the integration of different disciplines and knowing that you cannot solve sustainability challenges alone. By focusing on the inclusion of stakeholders in de interview and on how the entrepreneur deals with them, we can get a grasp of how the sustainable entrepreneur uses

diversity competence in entrepreneurial process. A general question that covers the broader concept of stakeholder engagement entails:
- Could you give me an example of how you involved stakeholders in your business and what effect their involvement had on your decision making?

More specific questions that can be asked as a follow-up are:
- Have you involved your stakeholders in addressing sustainability issues and if so, how did that work out?
- How do you decide what to do when stakeholders have different ideas/preferences?
- Do you try to find out to what extent stakeholders are willing to work with you and if so, how?

Theme 3: Systems thinking

This theme is based on Systems thinking competence. Systems thinking competence is described in literature as: *"Systems-thinking competence is the ability to identify and analyse all relevant (sub)systems across different domains (people, planet, profit, otherwise known as triple bottom line) and disciplines, including their boundaries. Systems thinking competence is the ability to understand and reflect upon the interdependency of these (sub)-systems, including cascading effects, inertia, feedback loops and accompanying cultures (Wiek et al., 2011)".*

In the closed ended questionnaire, Systems thinking competence is explained to the respondents as: *"In my daily routines, I apply a systems-thinking approach, meaning that before I start working on a sustainability issue I first identify the system(s) it may concern by examining the linkages and interactions between the elements that compose the system"*. The following items from the questionnaire are used to measure diversity competence of the respondent:
- I am able to identify key aspects of production chains and agricultural eco-systems
- I am able to identify the key operations of a company that have a negative impact on the environment or society
- I am able to analyse strengths and weaknesses of production chains and propose improvements to reduce the negative effects on the environment or society
- I am able to integrate social, environmental and societal issues into future plans of a company
- I am able to construct and consider different directions for sustainability in the future

A recurring concept in the descriptions and items is systems thinking. In addition, it is about identifying and understanding all (sub)systems that are relevant for the business and how their interdependency affects them. By focusing on systems thinking in the interview and how the entrepreneur identifies and understands (sub)systems, we get an understanding of the use of systems thinking competence by sustainable entrepreneurs. A general question that covers the broader concept of systems thinking entails:
- Can you explain how you approached the sustainability issue that your company is working on?

More specific questions that can be asked as a follow-up are:
- Do you look for opportunities in the production chain to lessen the environmental impact and if so, how do you use those opportunities?
- How do you work towards an understanding and a solution for a sustainability issue?

Theme 4: Risk and uncertainty

This theme is based on foresighted thinking competence. Foresighted thinking competence is described in literature as: *"Foresighted thinking is the ability to collectively analyse, evaluate and craft "pictures" of the future in which the impact of local and/or short term decisions on environmental, social and economic issues is appreciated on the global scale and on the longer term (Wiek et al., 2011)"*.

In the closed ended questionnaire, foresighted thinking competence is explained to the respondents as: *"I realise that dealing with sustainability issues in my job means that I have to be able to deal with uncertainty, that I can make future prognoses, and that I am aware of others' expectations and am able to make, and when necessary change, plans"*. The following items from the questionnaire are used to measure foresighted thinking competence of the respondent:
- I am able to identify risks and opportunities inherent in present and future developments
- In analysing and evaluating scenarios for action, I take the impact on the short as well as the long term into consideration
- In analysing and evaluating scenarios for action, I take both the impact on the local and the global scale into consideration

A recurring concept in the descriptions and items is risk and uncertainty. In addition, it is about the ability to create an understanding of the long-term future, based on the evaluation and consideration of local and/or short term decisions on sustainability. By focusing on how the entrepreneur deals with risk and uncertainty, we can get an understanding of how the sustainable entrepreneur uses his or her foresighted thinking competence. A general question that covers the broader concept of risk and uncertainty entails:
- How do you deal with uncertainty and risk of your business and did that change over time?

More specific questions that can be asked as a follow-up are:
- How did you identify the risks to your business?
- Do you include local and/or global impacts of your business in your decision-making and if so, how?

Theme 5: Communication

This theme is based on interpersonal competence. Interpersonal competence is described in literature as: *"The ability to motivate, enable, and facilitate collaborative and participatory sustainability activities and research. This competence domain includes skills in communicating, collaborating, negotiating, empathy and compassion (De Haan, 2006; Wiek et al., 2011)"*.

In the closed ended questionnaire, interpersonal competence is explained to the respondents as: *"I see that working on complex issues like sustainability is in most cases not something you do alone, it demands working with people who have very different backgrounds (e.g. entrepreneurs, government officials, activists, scientists)".* The following items from the questionnaire are used to measure interpersonal competence of the respondent:

- I am patient and sensitive to someone who "lets off steam" in complex issues
- In a personal conflict, I am able to take the others' perspective and really understand his or her point of view
- I am able to feel to what extent stakeholders are willing to cooperate in a project

A recurring concept in the descriptions and items is communication. In addition, it is about the ability to use communicational and social skills to initiate and support sustainability activities. By focusing on the communication and social skills of sustainable entrepreneurs, we can get an understanding of their use of the interpersonal competence in their entrepreneurial process. A general question that covers the broader concept of communication entails:

- How do you motivate and communicate with people you work with, knowing that sustainability demands a lot of discussion because of its many definitions?

More specific questions that can be asked as a follow-up are:

- How do you communicate your sustainability ideas to people you work with?
- How would you convince people to collaborate with you to work towards your sustainability goals?

Part 3: Interview structure and questions
1. Introduction (set up of interview, time schedule)
2. Ask permission to record interview

General questions to start interview
- How did you come up with the idea for your business?
- Why did you start your business?
- Do you consider yourself a sustainable entrepreneur and if so, why?

Theme 1: Personal values, motivation and action / Normative competence and strategic action competence
General question:
- What were your norms and values when you started, did they change over time and if so, why?

convert norms and values into actions; Do your norms and values impact your personal life; good sustainable practice in your business? Price of sustainability, investors.

Theme 2: Stakeholders, diversity competence
General question:
- Could you tell me how you involved stakeholders in your business and what effect their involvement had on your decision making?

Involve stakeholders in addressing sustainability issues; what to do when stakeholders have different ideas/preferences; to what extent stakeholders are willing to work with you and if so, how?

Theme 3: Systems thinking, systems thinking competence
General question:
- Can you explain how you approached the sustainability issue that your company is working on?

Do you look for opportunities in the production chain; work towards an understanding and a solution for a sustainability issue?

Theme 4: Risk & uncertainty, foresighted thinking competence
General question:
- How do you deal with uncertainty and risk of your business and did that change over time? Do you recall sleepless nights, because you did not know if your company would survive the next day(s)?

How did you identify the risks to your business? Do you include local and/or global impacts of your business in your decision-making and if so, how?

Theme 5: Communication, interpersonal competence
General question:
- How do you motivate and communicate with people you work with, knowing that sustainability demands a lot of discussion because of its many definitions?

Specific questions:
- How do you communicate your sustainability ideas to people you work with?
- How would you convince people to collaborate with you to work towards your sustainability goals?

Appendix 4: Codebook

Theme / Code	Description	Measures/indicators
Strategic action competence	The ability to arrange tasks, people and other resources, inspiring and motivating others, evaluating projects and taking action and initiative to effectively deal with sustainability issues	Involving right people to achieve goals, strategy, strategic way of working, identifying opportunities, monitor sustainability performance
Normative competence	The ability to map, apply and reconcile sustainability values, principles and targets. The normative competence enables the sustainable entrepreneur to assess and improve the (un-)sustainability of social-ecological systems, based on such values and principles	Norms, values, principles, good sustainable practice, explaining decisions on sustainability
Diversity competence	The ability to structure relations, spot issues and recognize the legitimacy of other viewpoints in business decision-making processes regarding environmental, social and economic issues, to involve all stakeholders and to maximize the exchange of ideas and learning across different groups (inside and outside the organization) and different disciplines (interdisciplinarity)	Stakeholder involvement, disciplines, bringing together social, economic and environmental conflicts, using various stakeholders to work on sustainability
Systems thinking competence	The ability to identify and analyse all relevant (sub)systems across different domains (people, planet, profit, otherwise known as triple bottom line) and disciplines, including their boundaries	Systems, production chains, linkages, interactions, interdependency of systems, approach to sustainability issue, understanding and solution to sustainability issue
Foresighted competence	The ability to collectively analysis, evaluate and craft "pictures" of the future in which the impact of local and/or short term decisions on environmental, social and economic issues is appreciated on the global scale and on the longer term	Risk, uncertainty, future, long term, global impact of business
Interpersonal competence	The ability to motivate, enable and facilitate collaborative and participatory sustainability activities and research	Dealing with someone who is upset, understand someone else's standpoints, communication, social skills
Organise team	Steps taken to create and organise a team of people with complementary talents to work for venture	Attracting people with complementary talents, new colleagues, motivate and communicate with team,
Venture creation	Organisational process of establishing a new organisation	Establishing new entity, establishing business, start own company, risks to business

Accessing first funding	First external funding to create and start venture	Investors, banks, funding, loans
Technology-market matching	Adjusting technology of venture to market demand	Product-market match, change product technology, change in market demand, idea behind company and its product(s), understanding of sustainability issue that is being worked on
Deciding on portfolio focus	Deciding on range of products to produce and sell to one or more markets	Product range, market application
Business model adaptation	Changing business model as experiment or under pressure from external forces	Value proposition, value creation, value delivery, value capture, effect of stakeholder engagement on business model, local and/or global impacts of business