

# Why SMEs should consider collaboration with other profit firms in order to improve sustainability innovation

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## 1 PREFACE

This thesis is the final chapter in my Network Economy education. I would like to acknowledge everyone who has supported me during the writing process.

I want to thank my thesis adviser, Jonas Van Lancker, for providing useful insights and his excellent expertise on research. I want to thank my proofreaders Stef Rutsaert, Allie Weis and Carine D'Oosterlinck. I want to thank Liesbeth Van Steenbrugge for being able to provide research articles I could not access myself and for checking this thesis for plagiarism.

I would like to thank my interviewees, Katleen Ooms, Lenja Doms, Saartje Allosserie, and Margot Vandeputte for their time and effort. You kept me motivated.

Finally, I want to thank my family and friends for supporting me throughout my academic years.

I hope that this thesis can provide the needed insights for SMEs to opt for inter-firm collaboration on sustainability innovation.

Emma Van Coillie, June 14<sup>th</sup> 2020

## 2 ABSTRACT

Every company needs to innovate in terms of both processes and products in order to stay relevant and profitable. Ecological sustainability is the way to go in the future. Firms can also choose to obtain ecological innovation by partnering with other firms. However, the research on the specific combination of these subjects is scarce. The purpose of this thesis is to provide the needed insights for (Flemish) Small and Medium Enterprises (SMEs) to opt for inter-firm collaboration on sustainability innovation. The thesis is based on a mixed methodology of a literature study through grounded theory and four in-depth interviews with SMEs. This thesis covers five themes. The first is existing theoretical frameworks, the second is prerequisites for a firm to start collaborating and the third is called motivations and incentives. The fourth theme is the forms in which a firm can collaborate, and the fifth theme is the influencing factors on a collaboration relationship. In total, 55 factors were detected that influence a (sustainable) collaboration, 7 forms in which a firm can collaborate are identified and different appropriation strategies are also briefly discussed.

**Keywords:** collaboration, partnerships, sustainability, environmental, innovation, firm, SME

### 3 INTRODUCTION

“Europe’s 25 million small and medium enterprises (SMEs) are the backbone of the EU economy. They employ around 100 million people, account for more than half of Europe’s GDP and play a key role in adding value in every sector of the economy. SMEs are deeply woven into Europe’s economic and social fabric” (European Commission, 2020). SMEs are very important to the European economy. Indeed, as the OECD (2015) states: “Reducing the environmental impact of small and medium-sized enterprises in both manufacturing and services is a key success factor in greening the economy. Improving the environmental performance is also a significant business opportunity for SMEs themselves as important suppliers of goods and services.” Moreover, climate change is a key influencer in the continued existence of SMEs. “Climate change is of significant importance particularly to the Small and Medium-sized enterprises (SMEs), which are considered as the most vulnerable among the business community to the effects of climate change” (Wedawatta et al., 2009).

“Sustainable development ought to be viewed more as a journey than a destination. As such, sustainability is as much a social transformation process as it is an environmental transformation process, requiring continuous capability building and management attention” (Jones, 2000). “Often they [SMEs] lack of information and resources (as it does they do not have the economies of scale when investing in these), have no a clear vision of sustainability (as they are concerned with survival, have a patriarchal thinking (as often there is only one investor and it is in their best interest for the company to succeed) and insufficient mechanisms of learning (due to lack of time and resources)” (O’Brien & Hamburg, 2014). This is why the thesis argues for collaboration between firms to obtain environmental innovation. “Firms cannot address sustainability challenges on their own, joint efforts are needed to integrate environmental and social considerations into economic decisions” (Seuring and Gold, 2013).

Mention (2011) states that the processes of inter-firm alliance formation and innovation have much in common: both are based on interaction between the firm and the environment and represent the results of collaboration between numerous actors inside and outside the firm. Cooperation is an innovation stimulus which should bring many benefits. Wassmer et al. (2012) also mention the need for research on inter-firm environmental collaboration, which is an underexplored topic. This thesis aims to be a motivator for SMEs to look at sustainable innovation collaborations with other companies.

This thesis brings two topics together: sustainability (innovation) and inter-firm collaboration (SME focused). It will provide a base for SMEs to consider collaborating with others in favour of the environment. The research question is: “What influences an inter-firm collaboration on sustainability with at least one SME?” For my analysis I will use two qualitative methods. Firstly, a literature study. Papers, articles and other research will be looked at to form a general theory about this subject. Secondly, four interviews will be held with four different companies to look into their environmental-oriented partnerships. This is a way to compare theory with reality.

#### THERE ARE 5 SUBQUESTIONS THAT WILL BE LOOKED AT

1. What are the existing theoretical frameworks to look at sustainable inter-firm collaboration?
2. What are the prerequisites for the firm and the partner in order to be able to collaborate?
3. Why would you collaborate to attain sustainability innovation?
4. Which forms can you collaborate in?
5. What are the influencing factors on the collaboration relation?

Section 1 until 3 are mainly used to introduce this thesis. Section 4 explains the method that was used, including how the literature and interviewees were found and how the interviews were conducted. In section 5, I will elaborate on the results and begin the discussion about theory versus practice. Section 5.1 is an overview of important authors in this field. Section 5.2 talks about environmental collaboration in theory, about existing frameworks. Starting from section 5.3 to 5.6, the same structure will be used as in the grounded theory table (table 8). The title of the section is the category. Then the thesis works down to dimension and then to code. In 5.3, I will discuss the prerequisites for firms to be able to work together. Section 5.4 covers the motivations and incentives to answer the following question: "Why would firms collaborate?" The forms in which firms can collaborate and appropriation strategies are talked about in section 5.5. Last but not least, the influencing factors within a collaborating relationship can be found in section 5.6. In section 6 are the conclusions that were made. The recommendations for stakeholders that can influence this subject in practice are also in section 6. Section 7 is the literature list, alphabetized. Section 8 is the appendix in which, among others, the literature table and the theory versus practice table can be found.

## 4 METHOD

A systematic literature review based on grounded theory will be used. This theory uses inductive reasoning, meaning that theory and key concepts emerge from the analysis of data. In a grounded theory literature review, concepts arise from the literature. The advantage of using grounded theory review lies in the systematic evaluation of textual data (Toufic El Hussein et al., 2014).

The process of this paper, using grounded theory (Klewitz & Hansen, 2011) and interviews:

1. Identification of keywords;
2. Specification of search engines and identifying articles;
3. Development of exclusion and inclusion of criteria;
4. Material evaluation through deductive and inductive categories to identify central themes and interpret results;
5. Set up interview questions and interview relevant parties;
6. Compare interview results with the theoretical framework.

*Step 1:* To identify keywords, a rough mindmap was made to brainstorm about the subject. A glossary (table 7) was composed, which can be found in the appendix. The definitions that are used in the glossary come from articles and papers or from dictionaries.

*Step 2:* Zotero was used as a reference manager. This thesis includes sources from the following databases; Elsevier Scencedirect, ResearchGate, Google Scholar, Wiley Online Library and Academic Research Ultimate (EBSCO). In these databases, a combination of the following keywords were used:

| Keywords                        | Synonyms   |
|---------------------------------|--|
| <b>Collaboration</b>            | Association, <b>alliance</b> , teamwork, teaming, <b>partnership</b> , joint effort, working together, cooperation, coaction, <b>synergy</b> , <b>symbioses</b> , give-and-take, mutual effort, coadjuvancy, 'beyond corporate boundaries', joint-venture, <b>governance</b> , ~relationship |
| <b>Sustainability</b>           | Green, environmental, ecological, environment-friendly, environmental effects  |
| <b>Inter-firm</b>               | Between firms  |
| <b>Ecopreneurship</b>           | Sustainable entrepreneurship, bioneer  |
| <b>Environmental innovation</b> | Sustainability-oriented innovation, sustainable innovation, sustainability innovation, CSR-driven innovation, sustainability-related innovation  |

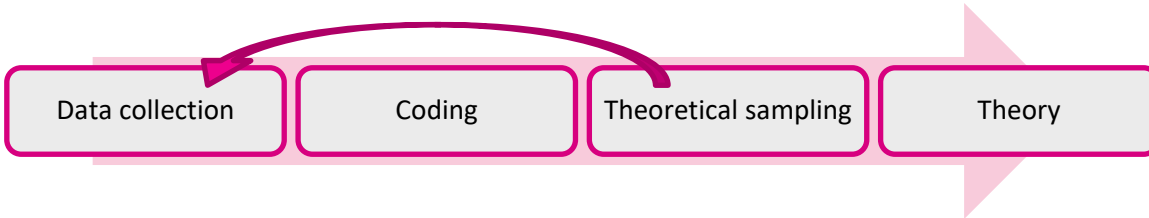
*Table 1 Keywords used for finding articles in databases*

Due to the results of the articles, subquestions were rewritten, deleted or new ones were added. When papers and scientific articles were read, the search for information continued by looking at the references or works cited in those articles. This is called the snowball method, more specifically, a backward reference search.

*Step 3:* The main part of this research used peer-reviewed articles and papers. Only a handful of grey literature was used. This review covers academic papers ranging in publication date from 1976 to 2020. In total, around 70 sources were accessed for this thesis.



*Step 4:* Grounded theory begins with data collection, involving the collection and review of literature. The author collects quotations and their sources. Then, the author assigns codes to recurring themes. The structure of the coding can be found in Table 2. The author starts to create a theory based on the data collection and coding, which is called theoretical sampling. There is a circular process of collecting data, coding, and sampling theories. The result is one (big) theory. The process of grounded theory is visualized as follows:



*Figure 1 Process of grounded theory*

The table that forms the base of the theory at the end will have this structure:

| <b>Name</b>               | <b>Content</b>   |
|---------------------------|--|
| <b>Category</b>           | The research subjects (= the research questions of this thesis)                  |
| <b>Dimension</b>          | The given hyperonymous theme of the codes  |
| <b>Code</b>               | A given name that summarizes the quotation                                       |
| <b>Quotation + source</b> | A quote from a research paper or article + source where the quotation stems from |

*Table 2 Structure of grounded theory table*

*Step 5 and step 6:* To compare theory to practice, interview questions based on the theory are presented. The interviews are semi-structured. Four SME leaders or representatives are interviewed with these questions. The list of the interviewees can be found in table 4. The interview is conducted in Dutch, as I am a Flemish student and sought full expression without any language barriers. The transcriptions and recordings can be accessed by contacting me via mail.

| Vragen (Questions)   |
|--|
| Heb ik toestemming om dit interview op te nemen?   |
| Moeten uw naam, bedrijfsnaam en/of de resultaten van dit interview worden geanonimiseerd?  |
| Bedrijfsnaam?  |
| Aantal full-time werknemers in het bedrijf?  |
| Naam van geïnterviewde?  |
| Functie van geïnterviewde?   |
| Korte omschrijving van de bedrijfsactiviteit: "Wat doet het bedrijf?"  |
| Wat waren u laatste drie innovaties richting duurzaamheid?   |
| Waar heeft u rond samengewerkt + met wie?  |
| Wat kwam er als resultaat uit die samenwerking (intern, extern, proces, product?)  |
| Met wie werkte u samen op duurzaamheid? Waarom koos u voor deze partner?   |
| Met welke partners heeft u nog samengewerkt (buiten andere profit bedrijven)?  |
| Wat is uw voornaamste motivatie om samen te werken met andere bedrijven?   |
| Wat is uw voornaamste motivatie om samen te werken met anderen op specifiek dit project? Wat heeft iedere partner bijgedragen?   |
| Hoe werd de samenwerking geformaliseerd?   |
| Waarom dit type?   |
| Werken jullie altijd zo?   |
| Gebruiken jullie ook types als joint venture, klassiek contract, mondeling akkoord en vertrouwen...  |
| Wat is er goed verlopen tijdens de samenwerking?   |
| Wat is er minder goed verlopen tijdens de samenwerking?  |
| Welke factoren hebben de samenwerking beïnvloedt, in positieve en/of negatieve zin?  |
| Als je het opnieuw zou doen, zou je iets veranderen? Zo ja, wat?   |
| Het is niet evident voor alle bedrijven om intens met anderen samen te werken. Sommigen voelen zich daar niet klaar voor. Wat moet er aanwezig zijn in je eigen organisatie vooraleer je zo'n samenwerking kan aan gaan? |

Table 3 Dutch interview questions

The following individuals were found through a [LinkedIn search post](#). This thesis used convenience sampling to find the interviewees. There are some risks related to convenience sampling, namely, sampling bias and the sample might not be representative for the entire Flemish SME population. The sample is also relatively small, which contributes to the risk that the interviews might not be representative of the researched population, namely the Flemish SMEs. The goal of this research is mainly to look at theory and to compare it shortly with practice at the end.

| <i>Focal firm</i>        | <i>Name of the interviewee</i> | <i>Job title</i> | <i># of people who work full-time in the firm</i> | <i>Short company description</i>   |
|--------------------------|--------------------------------|------------------|---|--|
| <a href="#">QFrame</a>   | Katleen Ooms                   | HR manager       | 42  | QFrame makes .net applications while creating as much value for as much stakeholders as possible.  |
| <a href="#">Allossa</a>  | Saartje Allosserie             | Owner            | 1   | Allossa is a design agency that focusses on a sustainable lifestyle.   |
| <a href="#">W.R.Yuma</a> | Lenja Doms                     | Co-owner         | 3   | W.R.Yuma designs and sells sunglasses in a circular economy.   |
| <a href="#">HNST</a>     | Margot Vandeputte              | Product manager  | 2   | HNST is a circular fashion brand. It collects old jeans, recycles it into new fabric and makes sustainable jeans. It wants to be the most sustainable jeans collection in the world. |

*Table 4 List of interviewees with basic information*

## 5 RESULTS AND DISCUSSION

The results and discussion are combined, this means that the grounded theory results and the interviews were combined and discussed together. Sometimes new factors were added or changed places in the original literature study because of the interviews. This will be made clear throughout the document. The pure results of the literature study can be found in the grounded theory table (table 8). The results of the interviews can be found in table 9 and 10. As mentioned earlier, the same writing structure as was used in table 8 will be applied starting from section 5.3 to 5.6. The title of the section is the category. Then the thesis works down to dimension and then to code. For example: Prerequisites (category) > Absorptive capacity (dimension) > HR (code). The quotations and sources can be found in table 8. In the upcoming text, synonyms for codes include factors and components.

## 5.1 OVERVIEW OF IMPORTANT AUTHORS IN THE FIELD

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As mentioned before, this thesis was written by using around 70 sources. The most important authors are mentioned here.

Stuart Hart is an important researcher who paved the way for many of the authors mentioned here. In the earlier days of sustainability research, Stuart Hart was the leading expert in the 90s and the early 00s. His work is used as a source in almost every paper and article about sustainable collaboration.

During my research, a pair of authors was found that often write together. Niesten and Jolink have collaborated on around 15 papers or other material. The sustainable approach on research started back in 2014, and in 2016 they wrote the first paper on sustainable collaboration. Currently, Albert Jolink is working on research called "Sustainable Collaboration". It will discuss strategic alliance motivations. He is also working on "Similarity of Alliance Partners: The Choice for Equity versus Non-Equity Governance Structures." All of these subjects come close to this thesis, showing how relevant the topic is.

Klewitz and Hansen are another pair of authors that influenced this thesis greatly. They write about sustainability-oriented innovation, specifically about SMEs. Johanna Klewitz is a research associate in the Centre of Sustainability Management at Leuphana University Lüneburg. Erik Hansen is a professor and the head of Institute for Integrated Quality Design (IQD) at Johannes Kepler University Linz.

An article from researchers in South Korea (Yoon et al., 2017) has provided useful research for this paper. Though the article was focused on the IT-industry, an important industry in Asia, their research was relevant to this paper. Their model looked at success factors for collaboration, which was defining input for the influencing factors of collaboration.

Stefan Seuring and Stefan Gold not only share the same first name, but they also collaborate on the same research. They are both professors; Stefan Gold is a professor of sustainability management, Seuring is a professor of supply chain management. Naturally, their research was a mix of these two topics. While Gold has recently been focusing on circular economy topics, Seuring continues in the direction of sustainability performance.

Wassmer, Paquin and Sharma wrote a paper on environmental collaboration in 2012. Their view on inter-firm environmental collaboration is interesting. However, they did not focus exclusively on inter-firm collaboration, but also firm-NGO, firm-government and firm-university collaborations. As mentioned before, Wassmer et al. (2012) also stated the need for research on inter-firm environmental collaboration, which is an underexplored topic.

Chen is a Taiwanese researcher and part of the Business Administration Department at National Yunlin University of Science & Technology. He wrote two relevant papers in 2008. He researched green innovation, green image and what green intellectual capital does for your competitive advantage.

Gray and Stites wrote a systematic review about multi-sector partnerships in 2013. Multi-sector meaning, in this case, not only between different companies, but also with governments, NGOs... and a mix of several of these. It's concrete, has study cases and is well substantiated.

Street and Cameron researched external relationships of small businesses. In their future directions they talked about three research questions, where one is relevant to this thesis. They questioned, "How do small businesses derive value from external relationships?" This paper talks, among other things, about the value SMEs can generate from collaborating and how they can achieve it.

## 5.2 ENVIRONMENTAL COLLABORATION IN THEORY

---

This section talks about the existing theory on (environmental) collaborations. It mentions macro and micro frameworks on (environmental) partnerships, the potential value that can be derived from such partnerships and the difference between environmental product innovation and environmental process innovation. This theory is interesting background information to take into account when answering the other subquestions of this thesis. At the end of this section, the theories are linked to each other to offer an oversight.

### 5.2.1 EXISTING THEORETICAL FRAMEWORKS ON ENVIRONMENTAL COLLABORATION (MACRO)

Sustainability is not a new buzzword in scientific research; as early as the 70s, environmental politics came of age. Back in the day, this mainly existed to control pollution through governmental control. "Environmental policy centred primarily on controlling air, water, and soil standards via quality targets or 'command-and-control' regulations on acceptable pollution emission levels from implicated industries. Pollution was perceived to be a problem that could be contained ad hoc with ex post remedial measures (Hajer, 1995). Typical abatement strategies under this regulatory regime were 'end-of-the-pipe technologies' such as filters on chimneys or drains, or water-processing plants" (Hartman et al., 2002).

There are many theoretical frameworks that describe and examine partnerships in sustainability. They all have a unique way to look at sustainable partnerships. Hartman et al. (2002) considered three theories; ecological modernization, governance theory, and sociotechnical change theory. This thesis considers these macro theories, they describe the ways environmental change can be implemented in a society other than the classic governmental control.

The first framework is called **Ecological Modernisation**. Mol and Sonnenfeld (2000) define this phenomenon as how contemporary industrialized societies deal with environmental crises. Ecological Modernisation does not ask for a complete reorganization of the core institutions of society, but rather it proposes an environmental reform of the modern organization of production and consumption.

The second framework, **Governance Theory**, tries to understand how well-mixed partnerships can cope with wicked environmental problems, wicked problems are explained later in the thesis. Well-mixed partnerships in the sense of networks of governmental, non-governmental and private actors. Collaborating with others as opposed to command-and-control situations from the earlier days (Hartman et al., 2002).

The third and last framework is **Sociotechnological Change Theory**. This theory looks at society in combination with technology. It aims at increasing the understanding of the dynamics and patterns of coevolutionary processes that inform where opportunities exist to trigger new actor linkages and alignments which can enable the creation of new transformational paths (Hartman et al., 2002).

### 5.2.2 EXISTING THEORETICAL FRAMEWORKS ON PARTNERSHIPS (MICRO)

Gray and Stites (2013) talked about many theoretical frameworks on partnerships. Theoretical framework 1 to 4 can be used to help explain the motives and incentives of sustainable collaboration. Framework number 5 can help explain the partnership subquestion, the 'who' and 'how' question can be answered here. Framework number 6 can be put under the challenges of sustainable collaboration. This thesis considers these the micro theories, because they describe the different ways collaboration can be looked at between two or more partners.

1. In **Institutional Theory**, "public expectations of corporations evolve with changes in the social environment" (Argenti, 2004). This means that firms only act on pressures outside of the firm in order to improve their perception to outsiders. To last as a company, these expectations need to be met.
2. **Resource Dependence** starts from the resources that firms need in order to be able to perform their service or provide their product. "When a particular resource is critical to an organization's survival or success, the organization is likely to attempt to either control it or co-operate with organizations that can provide it or regulate its provision" (Lambell et al., 2008). Most of the greening collaborations with supply chain start from this theory.

3. **Stakeholder Theory** is straightforward, the name says it all. It stems from the need to satisfy the stakeholders inside and outside your company. Anything that you do, affects them. It explains why organizations engage in sustainability actions and shows that firms who 'do good' through donating to charity, supporting local causes, have better stakeholder relations and so on (Gray & Stites, 2013).
4. **Resource Based View**, commonly abbreviated as RBV, assets are used to gain a competitive advantage. Studies that use this theoretical perspective, see partnerships as a way to expand the assets of both or more parties (Gray & Stites, 2013).
5. **Network Theory** looks at the relationship between collaborating parties. Firms want to improve both upstream and downstream sustainability. "Partnering with organizations in a firm's supply chain can have a profound impact on the firm's sustainability trajectory" (Gray & Stites, 2013).
6. **Agency Theory** and **Transaction Cost Economics (TCE)** starts from the opportunistic behaviour of individuals within a company or collaboration. "From the perspective of agency theory, there is a conflict as to whether the "agent," typically a hired manager, acts in his or her own self-interest or in the best interests of the "principal," typically the body of shareholders that hired the manager" (Gray & Stites, 2013). TCE looks at the costs that are made when making certain decisions, such as outsourcing. We see that the collaboration between firms and NGOs is explained using these combined theories (Gray & Stites, 2013).

### 5.2.3 VALUE CREATION IN COLLABORATIONS

Austin and Seitanidi (2012) proposed four types of value that can be created through partnerships. However, in reality, a combination of these four types can often be found.

1. **Associational value** is the creation of extra credibility by simply having a collaborative relationship. This will mostly be projected on their firm image and as such, how stakeholders perceive the firm. However, how the image improves will depend on the partner that the firms collaborates with (Kim et al., 2012).
2. **Transferred Resource value** is all about resources shared among the partners. The higher the value of these resources, the higher the Transferred Resource value is. This value type is reflected in means as exchanged know-how and skills or access to new durable products.
3. **Interaction value** refers to the benefits generated by working in partnership, such as shared knowledge and improved trust between partners" (Kindornay et al., 2014). This differs from Transferred Resource value because the new obtained knowledge is created during the partnership. "Cocreating value both requires and produces these intangibles, for example, reputation, trust, relational capital, learning, knowledge, joint problem solving, communication, coordination, transparency, accountability, and conflict resolution" (Austin & Seitanidi, 2012).
4. **Synergistic value** assumes the synergistic idea that 1 plus 1 equals 3. By collaborating, the partners accomplish more than they would on their own. "Our specific focus is that the collaborative creation of social or environmental value can generate economic value and vice versa, sequentially or simultaneously, thereby creating a virtuous value circle. Innovation is a driver of the synergistic value creation that produces completely new forms of change due to the combination of the collaborators' distinctive assets, thereby holding the potential for significant organizational and systemic transformation and advancement at the micro, meso, and macro levels" (Austin & Seitanidi, 2012). This can be the most transformational value that can be created in a partnership: innovation.

In the interviews (see figure 9 and table 9) every single interviewee created Transferred Resource Value and Synergistic Value. Two interviewees create all four values and one creates it not only all for themselves, but also for their partners. This is because they have multiple partnerships going both ways on receiving or giving resources (both tangible and intangible).



## 5.2.4 PROCESS VERSUS PRODUCT INNOVATION

To reach sustainability-oriented innovation, it is important to make a difference between environmental process innovation and environmental product innovation. The differences are shown in this table based on research from Klewitz and Hansen (2011; 2014) and Grevoka et al. (2013). The examples come from the study of Wassmer et al. (2012).

Environmental process innovation is an exchangeable term for organizational innovation. However, the paper of Klewitz & Hansen (2014) made a difference between the two. Organizational innovation is a broad term, whereas environmental process innovation underlines a specific part of the organizational change. A part of organizational innovation might be environmental management.

| Kind of environmental innovation | Environmental process innovation   | Environmental product innovation  |
|----------------------------------|--|---|
| <b>Focus</b>                     | Environmental <b>management</b>  | Environmental <b>innovation</b>   |
| <b>Subtopics</b>                 | Eco-efficiency, cleaner production, environmental management system, ISO 14001   | Life cycle assessment, Life cycle costing, eco-sustainable design, fair-trade products                              |
| <b>Requirements</b>              | Requires internal-oriented environmental management, continuous improvement  | Requires the engagement of external parties, should be integrated with stakeholders                                 |
| <b>Green core competences</b>    | “In other words, the results showed that the more the investments in the green core competences of firms, the better are their green product innovation performance, green process innovation performance, and green image” (Chen, 2008).  |   |
| <b>Difference</b>                | Only a cost efficiency advantage   | Differentiation advantage, improves productivity  |
| <b>Results</b>                   | Green core competences, ultimately leads to product innovation →   | except when external parties are considered, then environmental management has little effect on product innovation. |
| <b>Examples</b>                  | Implement economically feasible environmental systems, apply best practices  | Develop new businesses focusing on new technologies, codevelop new environmental products                           |
| <b>Conclusion</b>                | “Both types of environmental innovation can provide firms with advantages for their performance” (Grekova et al., 2013). That is why this research will consider both these environmental innovations. In the interviews we saw the same trend, product and process innovation often interlock. Environmental innovation will also be referred to as sustainability-oriented innovation. |   |

*Table 5 Environmental process versus product innovation. Based on research from Klewitz and Hansen (2011; 2014) and Grevoka et al. (2013). The examples come from the study of Wassmer et al. (2012).*

Environmental process and product innovation (see table 9) are both seen in the interviews. We see that environmental process innovation is mostly created for the interviewees and that environmental product innovation is created for the partners of the interviewees. A possible explanation could be that the interviewees were mostly resource providers (typically knowledge) as seen in figure 9. We have one interviewee that explicitly both offers and receives resources, and this results in the most complete amount of value creation and innovation. However, the sample is too small to make any general conclusions about value creation and innovation for the Flemish SME population.



5.2.5 BRINGING THE THEORETICAL FRAMEWORKS TOGETHER

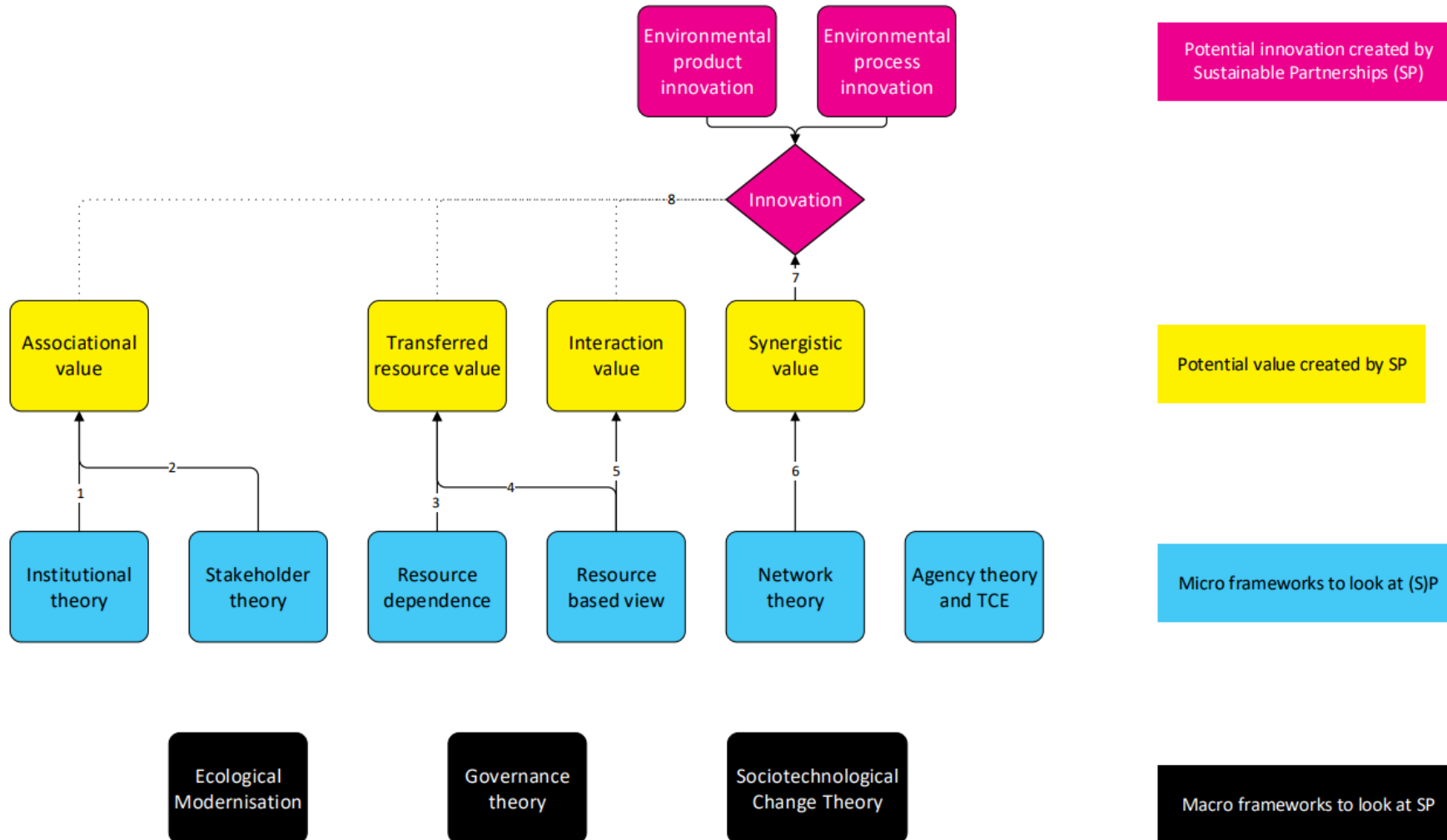


Figure 2 Links between the different theories

This model (figure 2) visualizes the links that can be found in the many theories mentioned earlier. Based on what value is created during the collaboration, one can speculate about which micro framework the partner and/or the focal firm use to look at sustainable collaboration. The links can be explained in simple sentences:

- 1) This link refers to the importance of brand image during a collaboration;
- 2) This link refers to the importance of stakeholders;
- 3) This link refers to the importance of resources;
- 4) This link also refers to resources;
- 5) The assets created during a collaboration (thanks to the interaction) can be looked at through RBV glasses;
- 6) This link refers to the value created between partners, the value created in a network;
- 7) Synergistic value mainly creates innovation, two components of innovation are environmental product innovation and environmental process innovation;
- 8) Every value contributes to the innovation story, however the synergistic value provides the most value to innovation – as mentioned earlier in number 7.

### 5.3 WHAT DO YOU NEED (INTERNALLY) IN ORDER TO COLLABORATE WITH OTHERS?

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#### 5.3.1 INFLUENCES ON THE CHOICE TO COLLABORATE

De Faria et al. (2010) found that firms have a higher chance of participating in innovative collaborations when there are high levels of absorptive capacity, exports and innovation intensity. The probability also rises when the firm is part of a group, such as a network, and when appropriability management is deemed as important. Firms typically consider collaboration important to innovation when it invests in R&D and deems innovation intensity and management, and knowledge spillover management as significant. But the level of technology can also play a role, the higher this is – the higher a value firms assign to partnerships. The amount of resources that is devoted to innovation activities can also play a role in the decision whether or not to choose a partnership. “If partners are geographically close, the possibility of collaboration rises” (Sherer, 2003). Some of these could also be considered prerequisites.

#### 5.3.2 PREREQUISITES

There are some prerequisites that firms need before they can look for partnerships. First of all, the partner firm should also have prerequisites in order to collaborate successfully. Moreover, these are also characteristics the focal firm should look for in their partners in order to have a balanced partnership.

#### ORGANIZATIONAL CULTURE

Organizational culture has four components that should be right in order to be able to collaborate. The working climate, strategy formulation, interaction of organization with other stakeholders and the mindset should all point to a collaborative, knowledge-inducing culture. Especially when words as ‘sustainable’ and ‘environment’ are added, it is important these words are carried to actions even before a collaboration starts. The company culture should already be or strive to be green while working together with others to achieve more.

1. The **working climate** talks about the workplace environment. “Healthy, communicative work environments support an efficient work force that is ready to commit daily to its assigned tasks to keep the company running profitably. A poor work environment, on the other hand, doesn’t support a strong, motivated team environment.”<sup>1</sup>
2. **Strategy formulation** is the procedure by which a firm picks the most suitable courses of action to accomplish its defined goals. “Organizational culture determines the way in which management gathers information and analyses both the environment and company resources” (Janićijević, 2012). That is why strategy formulation is part of the dimension ‘Organizational culture’ instead of the dimension ‘Management and leadership’.

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<sup>1</sup> Cyprus, Sheri. ‘What Is a Work Climate? (With Pictures)’. *WiseGEEK* (blog), 3 June 2020. <http://www.wisegeek.com/what-is-a-work-climate.htm>.

3. The **interaction of the organization with stakeholders** can be connected to many other factors, such as mindset (number 4) and the awareness of the employees (see dimension 'Management and leadership'). It could also relate to certain attitudes and values, as seen in 'Internal knowledge sharing' (number 5).
4. **Mindset** can be compared to the DNA of the company, the way the firm wants to go should be clear from the mindset. From one of the interviews, we learned that the genes of the CEO of the focal firm should already be green-oriented. The mindset of the company as a whole needs to go towards sustainability, with a trickle-down effect to HR. If HR has a clear vision, the people that get hired will most likely share that vision, which is further discussed in dimension 'Absorptive capacity'.
5. **Internal knowledge sharing** changed places because of the interviews. It moved from dimension 'Project team' to dimension 'Organizational culture'. Internal knowledge sharing relates to certain attitudes and values and/or it also is a collaborative process (Santoro et al., 2006). If it indeed is a collaborative process, it could add to the overall collaborative capability mentioned in the dimension 'Management and leadership'.

## ABSORPTIVE CAPACITY

Absorptive capacity, or organisational learning, can be seen as one of the base requirements to be able to collaborate. "Absorptive capacity is the ability of the organization to fully and successfully understand, evaluate and utilize the external knowledge provided by the stakeholders" (Van Lancker et al., 2016). Muscio (2007) researched the effects of absorptive capacity on SMEs' collaboration. He showed that you need the proper capability to search, find, access and interpret (new) knowledge in collaborations with external partners. R&D, human capital and HR are three characteristics that describe absorptive capacity.

1. **R&D** is important because it gives rise to both new knowledge and innovative capacity.
2. **Human capital** means having skilled employees. This can be achieved by two components, hiring graduates and continuous training of the employees.
3. **HR** creates the setting to attain proficient employees and upskill them. These investments need to be constant to achieve collective efficiency of innovation systems. The author also argues that absorptive capacity is especially important in environments where externalities are plenty, because there are more opportunities (Muscio, 2007).

## MANAGEMENT AND LEADERSHIP

Management and leadership also play a role whether or not a firm is ready to collaborate on (sustainable) innovation. This has four components.

1. **Awareness of the employees:** The employees have to recognize their role or part in the innovation system. They should be aware that their company is moving forward, that is where the second component comes in.
2. There is a need to **fight the resistance to change** and open up the employees' or management's willingness to change.
3. **Ecopreneurship** means that there should already be an interest in sustainable development of the company. One of the interviewees said that "*I do think that ecopreneurship is an important condition. That is our reason for existence. For our partner, that depends, the company does not have to be sustainable in detail. We also work with partners who put in a lot of effort and have the right mindset, but that doesn't mean they are sustainable down to the last detail. We would never work with a company from who we know that their business is unethical or where the environmental impact of the company is unacceptable.*" Every interviewee mentioned this factor.
4. **Collaborative capability** also known as relational capability is the ability to see opportunities and find partners for sustainability challenges. This can be linked to absorptive capacity in the sense that collaborative capability seeks opportunities and absorptive capacity makes the most of those opportunities. Every interviewee mentioned this factor.
5. Something that was not seen in the literature, but repeated during the four interviews, was that the firm should be willing to invest. It depends on the receiving end of the newest knowledge. If the focal firm is looking for the innovation from external parties, the firm should **have the ability and be willing to make financial investments.**

## PROJECT TEAM THOSE INTERNALLY RESPONSIBLE

The component “Project team” was moved from dimension to code after the interviews. Together with the code “Collaborative leader”, it stands under the new dimension “Those internally responsible”. We learned from the interviews that there should be people internally responsible for the collaboration. Bigger firms often have a project team (with a collaborative leader), smaller firms often only have their leader. When their leader engages in sustainability-oriented collaboration partnerships, the leader often resembles a collaborative leader. In the case of sustainable collaborations, the lead within these partnerships is taken by the boss of the company who often is a collaborative leader.

1. A **project team** is often a requirement for the medium to big companies, whereas the need for one is small or even non-existent for smaller companies or start-ups. We see that a collaborative leader is important in every collaboration, but even more so when there is no project team. The variable project team consists of two components, namely R&D team and internal knowledge sharing. The R&D team means that the team should be knowledgeable about the subject at hand. Internal knowledge sharing is distributing the information with everyone within the company that could either add information or learn from the project.
2. The **collaborative leader** was originally a part of the category “Managing the relationship”. This has been changed after the interviews and placed here. The collaborative leader in a partnership is an important part in the collaboration. I have found many literature sources referring to this concept. “These collaborative leaders are not an expert on the technical nor environmental know-how, but rather people “who have the credibility and entrepreneurial initiative to bring the right individuals, organizations, and constituents together constructively to create visions, solve problems, and reach agreements. In sum, collaborative leaders are the catalysts for stakeholder collaboration” (Hartman et al., 2002). Every interviewee mentioned this factor.

## 5.4 WHY WOULD YOU COLLABORATE TO ATTAIN SUSTAINABILITY INNOVATION?

The focus of this paper is on inter-firm collaborations. “Inter-firm collaboration (hybrid) is viewed as one of the three core governance structures that coordinate relations between firms (Williamson, 1996), next to markets and hierarchies (Coase, 1937; Williamson, 1998). When pursuing a sustainable opportunity, inter-firm collaboration is an important governance structure for several reasons. When firms sell sustainable products and services to end users, they need to consider sustainability in the entire supply chain and collaboration with supply chain partners is therefore required (Jolink and Niesten, 2015; Seuring and Müller, 2008). Furthermore, the adoption of sustainable technologies can be accelerated when they are implemented in different sectors, and cross-sector collaboration between firms will therefore enable the diffusion of sustainable innovations (Van Tulder et al., 2016)” (Niesten et al., 2016).

“Collaboration has more advantages than competition. Although it is challenging to implement collaborating environments than competition, an effort to achieve that has to be started.” (Fachrunnisa et al., 2012) If we decide to better our sustainability while collaborating, it means we better the environment. At the same time, if companies decide to compete with each other e.g. using non-recyclable raw materials to achieve lower prices, we choose winning against another company over the longevity of nature. On the other side of the spectrum, in order to be able to compete with bigger companies, the ability of SMEs to utilise external networks efficiently may determine their success (Muscio, 2007). “The benefits of collaborative efforts may go beyond the performance of the inter-firm collaboration, resulting in bottom-up effects on the formal rules at the level of the institutional environment” (Niesten et al., 2016).

“Collaboration is one of the keys for unlocking sustainability. No single organization or sector has the knowledge or resources to “do it alone.” Leaders from all sectors of society agree that solving sustainability challenges will require unparalleled cooperation” (Gray & Stites, 2013). This means that every company, no matter big or small, needs collaboration to attain sustainability. But this is especially true for SMEs, because they are limited in time and financial capacity and so on. De Faria et al. (2010) says that SMEs are establishing more and tighter relationships with other companies in order to achieve economies of scale, market strength or to exploit new opportunities.

“For small- and medium-size enterprises (SMEs) - in particular - research shows that Ecs [Environmental Collaborations] can enhance competitiveness, environmental reputation, and credibility (Mendelson & Polonksy, 1995; Stafford et al., 2000) by increasing reach and access in the marketplace (Gombault & Versteeg, 1999; Gunningham & Sinclair, 2002) and better engaging and educating consumers through product and organizational endorsements. For example, through interfirm Ecs, small and medium sized combined heat and power plants competed more effectively in regulated energy markets by offering services through their Ecs similar to those that their larger competitors offered on their own (Andersen & Lund, 2007)” (Wassmer et al., 2012).

“Sustainability problems, by their nature, are complex and different from the products and services with which firms typically deal... this complexity needs to be matched by more complex forms of governance that draw upon resources and capabilities that may lie outside the boundaries of the firm” (Husted & Sousa-Filho, 2017). Sustainability is a complex story that may even need a more complex solution. It is a wicked problem, “A wicked problem is a social or cultural problem that is difficult or impossible to solve for as many as four reasons: incomplete or contradictory knowledge, the number of people and opinions involved, the large economic burden, and the interconnected nature of these problems with other problems.”<sup>2</sup> At the same time, “Environmental reality is socially produced” (Hartman et al., 2002). This means that whatever becomes of the environment, is due humans and their interaction with both nature and each other.

#### 5.4.1 MOTIVATIONS AND INCENTIVES

Wassmer et al. (2012) found that the main use of inter-firm environmental collaborations is to exploit economic opportunities surrounding natural environment related issues, e.g. greener products. The exemplary studies on inter-firm environmental collaborations are recognized as either environmental product innovation or environmental process innovation. One of the interviewees said, “The fact that companies have win-win without being competitors. The fact that you work together is really worth gold, and that is an improvement anyway. You live in a system, but if you are only one link, you cannot change that whole system,” about collaboration.

#### EXTERNAL MOTIVATIONS

Regulatory pressure, stakeholder pressure and competitiveness are the three main components here.

1. **Regulatory pressure and incentives** mainly talk about environmental regulations and subsidies or other motivations the government can give. These can enforce a change that one company alone cannot handle. It can also motivate firms with financial backing, tax breaks and so on. An interviewee mentioned that governmental backing helped their specific case, but only to partly cover the extra costs the firm took on itself by investing in green alternatives.
2. **Stakeholders** can demand change when there is a raise in social environmental awareness. Stakeholders could include customers, suppliers, people who physically live close to the company, shareholders...
3. **Gap in market created through the downsizing of another firm** means that because another company downsizes, new opportunities arise for other firms to possibly fill with environmental-oriented collaboration.

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<sup>2</sup> *Wicked Problem*. (n.d.). Wicked Problems: Problems Worth Solving. Retrieved 12 May 2020, from [https://www.wickedproblems.com/1\\_wicked\\_problems.php](https://www.wickedproblems.com/1_wicked_problems.php)

## INTERNAL MOTIVATIONS

Internal motivations are motivations that come from within a company. This means that the employees, management, leader... could become progressively more aware about the environment. During the interviews, this was seen as the most important overall category of sustainability collaboration. Especially the resource and capability gaps were the main motivation to find an external partner.

1. Improved **environmental performance** could be a motivation which could be connected to other internal motivations or market gains such as firm image. Firms could also bet on this because they want to improve their environmental rating or obtain sustainable labels.
2. Greening **internal processes**, as seen in the interviews, could include a purchase policy for electrical cars or different manufacturing ways.
3. **Reducing packaging, pollution, waste or valorize the waste** from their own activities as a firm can be a motivation.
4. Through partnerships, there could be **cost reductions**. In practice we have seen that this is not the case for sustainability partnerships. These kinds of partnerships often ask for more financial investment rather than reducing costs. If we look through another perspective, the fact that some interviewees do not have to invest in certain processes etc. means that in some way, they do reduce (investment) costs.
5. **Optimal resource utilization** can be a motivation to look at (sustainable) partnerships. By optimizing the resource utilization, costs could also reduce.
6. **Resource and capability gaps** are openings in resources that firms fill with partnerships. For example, companies themselves have to invest less in R&D because of partnerships. They are the most important motivations according the interviews. All the interviewees said that this was a very important motivation for them or their partners to collaborate.

## MARKET GAINS

1. The ability to ask a **higher product price, accomplish higher product quality or a higher turnover** could also be market gains.
2. There is the **firm image** that can get better, which can lead to greater sales and talent generation. From the interviews we learned that firm image can also be influencing the partner choice. One interviewee said: "*The company wants a good image for the customer: the customer ultimately remains king,*" while two other interviewees mentioned that is less and less the main motivation for companies to invest in sustainability. This difference in opinion could be contributed to many reasons, such as product-provider versus service-provider, age of the interviewee, the kind of partners the interviewee works with and so on.
3. There is also a creation of **legitimacy of sustainability and its technologies** through collaboration. This could be the technology of the focal firm or the partner firm. Because the firms use this sustainable technology, may it be a product or a service, it shows that the technology works. While this factor was often mentioned in the interviews in between the lines,
4. You can maintain and/or increase **competitiveness** by investing in environmental innovation.
5. **Reaching new customer segments** was also suggested by one of the interviewees. For example, it is a way to spread awareness about sustainability to customer segments that are hard to reach.



## INNOVATION GAINS

The most important goal for collaborating is innovation gains. The ability to innovate in both product and process cannot be disregarded. Innovation gains has two components, namely knowledge and expertise and new product development.

1. **Knowledge and expertise** are relevant to both environmental product and environmental process innovation. De Faria et al. (2010) argues that firms who are enrolled in cooperation activities or alliances are involved in denser knowledge flows than firms who not ally with others. This was mentioned by all the interviewees.
2. **New product development** is the development of a new product to put out on the market. Here environmental product innovation is key. Two or more firms collaborate to commercialize a new product to go to the market with.

As talked about before, there is environmental product innovation and process innovation. The innovation gains can result in both or one of them, thanks to either obtained/created knowledge and expertise or new technology. During the interviews, this always came around as the goal. One firm wants to create a new product or improve an internal process, so they look for ways to gain the knowledge and/or technology. As mentioned before, in table 9 can be seen which interviewee obtained which innovation and which value. From the interviews we see that environmental product innovation often is combined with environmental process innovation.

## 5.5 WHICH FORMS CAN YOU COLLABORATE IN?

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### 5.5.1 INTER-FIRM COLLABORATIONS

There are several governance forms available to collaborate. “Examples of collaborative governance forms are numerous, and include contractual alliances, joint R&D alliances, marketing alliances, production alliances, unequal joint ventures, 50-50 joint ventures, associations and cooperatives (Jolink and Niesten, 2012; Kale and Singh, 2009)” (Niesten et al., 2016). But not only the available choices, but also external influences play a role in choosing the right form. “Characteristics of the economy such as financial uncertainty and changing risk levels increases the popularity of alliances (Weaver et al. 2000) and influences the type of alliance strategies used (Weaver, Dickson, and Gibson 1997)” (Street & Cameron, 2007).

Zizlavsky & Estélyiová (2013) identified 7 kinds of inter-firm partnerships. “Vodáček and Vodáčková (2002) named these relationships strategic partnerships and defined their following forms: free forms (occasional cooperation and informal agreements), strategic alliances (more specific interpretation of the category), joint ventures (strategic alliances more broadly interpreted) and “close” forms (mergers and acquisitions). The implementation of resource-grouping or activities relating to important economic or functional areas leads to cooperation on a strategic level (Buzády & Tari, 2005). In these relations the emphasis is on the further growth and development of the firms (Gulati, 2007). Child (2005) stated that “strategic” in the description of these relationships defines the purpose of their creation, which is to facilitate achieving the strategic goals of the companies through methods that can be implemented more conveniently in cooperation than individually” (Zizlavsky & Estélyiová, 2013). Different partnerships will have different advantages and disadvantages, with different outcomes. All of the interviewees had contractor relations with their partners, which can be a typical Flemish SME way to go about this. However, we do not have enough data to support this claim.

| Type of cooperation                     | Typical duration | Advantages   | Disadvantages  |
|---|------------------|--|--|
| <b>Outsourcing Contractor relations</b> | Short-term       | Reduction of costs and risks<br>Shorter time of implementation                                   | Dependence on partners<br>Product quality<br>Inefficient R/D                   |
| <b>Licensing</b>                        | Fixed term       | Faster access to technologies<br>Lower costs of R/D<br>Faster product development                | Contractual costs and restrictions   |
| <b>Spin-off companies</b>               | Medium-term      | Expert knowledge<br>Radical innovations  | Lack of business experience<br>Risks   |
| <b>Research consortium</b>              | Medium-term      | Sharing of costs and risks<br>Combination of expertise and special equipment<br>Shared financing | Knowledge leaks<br>Follow-up differentiation                                   |
| <b>Strategic alliance</b>               | Flexible         | Low level of the bond<br>Access to markets   | Potential blocking<br>Information leaks  |
| <b>Joint venture</b>                    | Long-term        | Shared know-how<br>Access to new markets   | Cultural disharmony<br>Unstable and unsure (threat of take-over or separation) |
| <b>Innovation networks, clusters</b>    | Long-term        | Dynamic cooperation<br>Potential for learning and gaining of knowledge                           | Unstable relations<br>Cost of control and maintenance of network               |

Table 6 Zizlavsky & Estélyiová (2013)

### 5.5.2 APPROPRIATION STRATEGIES

“Whether or not a collaborating firm can realise a positive return on its involvement in IFC [Inter-Firm Collaboration] for innovation is dependent not only on the firm’s investment in its own knowledge assets, but also on its capacity to economise on the cost of establishing a proper system for protecting its commercial interests generally, and specifically in regard to the knowledge assets it transfers to partner firms” (Torugsa et al., 2016).

Not all partnerships are formalized, some are based on trust. However, the new technology or knowledge that comes from a partnership can be protected by an appropriation strategy. The appropriation strategy should be ready when collaborating, especially when environmental product innovation is strived for. This can either be formal or informal. Formal appropriation can be trademarks, (co-)patents, copyrights, non-disclosure agreements and confidentiality agreements (Van Lancker et al., 2016). The opposite is an informal agreement, which is mostly based on trust. This includes secrecy, complexity of design and the benefit of lead times or first mover advantage (Van Lancker et al., 2016).

One interviewee had a patented product, the rest worked mainly on trust or exclusivity contracts. One of the interviewees started their contractor relation with an NDA so that both firms could create a new product together. They now have an exclusive contract with that firm for a specific part of the production process. Every collaboration started based on trust, once there was enough trust or mutual product development, the interviewees formalized the collaboration with their partner.



## 5.6 WHAT ARE THE INFLUENCING FACTORS ON A COLLABORATIONAL RELATIONSHIP?

There are many factors that influence a collaboration. Yoon et al. (2017) says that there are differences in importance of influencing factors among collaboration types. Managers or facilitators should consider different strategies in pursuing collaboration depending on the collaboration type. Look at knowledge-sharing culture, sharing of collaboration experience, openness and exchange collaboration – these are all factors that are mainly important to SMEs. These factors are translated to (internal) knowledge transfer, sharing of collaboration experience, mindset and (external) knowledge transfer in this thesis. Different influencing factors also achieve different results. Partner characteristics are especially important to process innovation and added competitive value.

A firm can collaborate on an international scale or in the domestic market. Mostly, collaborations between or with SMEs take place in the domestic market. In the domestic market the factors 'method of work', 'performance distribution' and 'mutual trust' are especially important. (Yoon et al., 2017) In the theoretical framework table, the method of work is relationship management. Mutual trust can be found under confidence. Performance distribution means the performance of employees. (Deadrick & Gardner, 1999) In the case of collaboration, this means the distribution of employees between collaborating parties and their quality of work. This is also a part of relationship management, especially a characteristic of role-setting.

This thesis combined four different models (figure 3) on success factors for collaboration. Street and Cameron (2007) researched this topic extensively. Their model talks about what influences an external relationship in small businesses. This thesis combines this model with a more recent version made by Yoon et al. (2017). Yoon et al. is a general version of success factors of collaboration. The third model that was added, was made by Zizlavsky & Estélyiová in 2013. They created a conceptual model of collaboration. The last model was made by Wassmer et al. (2012). They looked at firm-focused environmental collaborations. Each model can be found in appendix under 'effects on collaborations – models'. Underneath this scheme, the pertinent factors will be looked at in detail. Any of these can be considered a challenge to collaboration. By adding these three models together, an overview of factors influencing a collaboration was assembled. There were even extra additions to motivations and incentives through this method.

The shared topics between the different models are visualized by colored lines and were mentioned or will be mentioned under the right dimension:

- Pink: Performance indicators;
- Light blue: Competition and competitive advantage;
- Orange: Prerequisites;
- Green: External environment influencing factors;
- Red: Characteristics of a partner;
- Dark blue: Characteristics of a relationship.

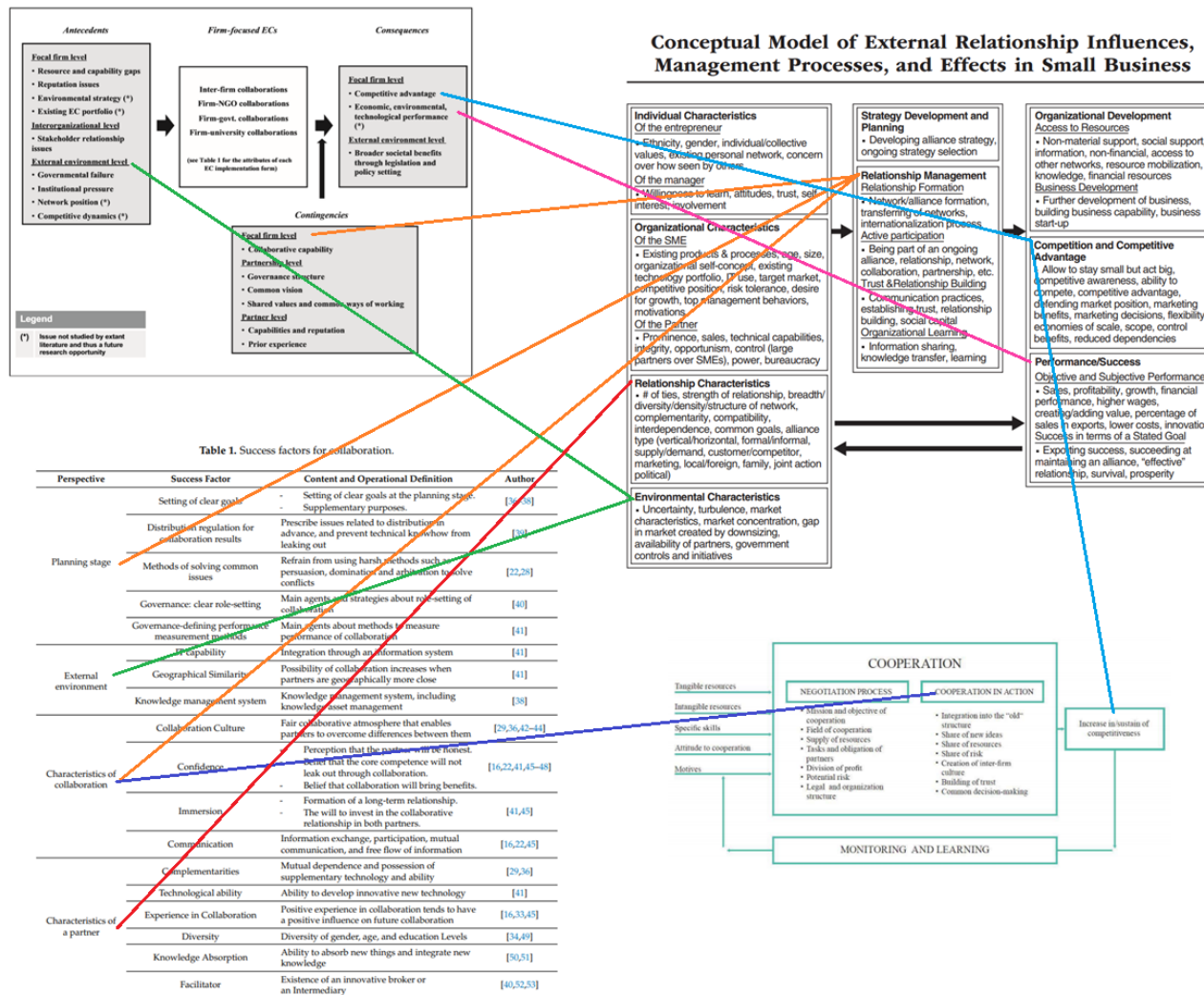


Figure 3 Relationships between different models looking at collaboration. From left to right, starting from top left: Wassmer et al. (2012), Street and Cameron (2007), Yoon et al. (2017) and Zizlavsky and Estéyriová (2013).

## PARTNER SELECTION

De Faria et al. (2010) has found that firms can choose between two kinds of partners. The first one allows the focal firm to build on the existing internal knowledge, the second kind of partners provides new knowledge. This new knowledge aides in defining trajectories that are new to the focal firm. The first kind of partner works on process innovation, the second kind influences product innovation. When selecting a partner, there are seven elements to take into account. You can also look at the prerequisites mentioned earlier in the text.

- 1) It is important that the partner firm has **complementary resources**, no matter if they are tangible or intangible. This goes beyond production means, it also includes customer bases, sustainable technologies, knowledge and so on (Niesten et al., 2016). This factor was mentioned by every interviewee.
- 2) The more **diverse** the partner is when compared to the focal firm, the better the results should be (Yoon et al., 2017). There was little to nothing mentioned about diversity during the interviews.
- 3) **R&D ability** of the partner firm is important, because it implies the amount of new knowledge, technology etc. that the focal firm can win through knowledge sharing.
- 4) The amount of **experience with collaboration** influences a partnership in the sense that the partner or focal firm understands the partnership process.
- 5) Which side of the partnership takes **control**, affects the overall performance. Street and Cameron (2007) say that often the bigger firm has the upper hand in the power struggle. Though not explicitly mentioned during the interviews, it became clear that there were interviewees who struggled with the other company when it came to control. One interviewee said it wanted all the freedom on the project it could get, while another interviewee said that their partner firm did not treat them like a priority and had control over it all.
- 6) **Firm size** can influence a collaboration in different ways. The bigger the partner of the focal firm, the more it is reassured of its survival. On the other hand, the bigger partner more likely has more bureaucratic processes which can significantly slow a partnership. In the interviews it was stated that bureaucracy and firm size are especially hard on communication and as said before, it also influences the control factor.
- 7) The number of **available partners** can influence the terms on which you close the partnership deal. If there are many alternative partners, the value of the resources a partner can offer lowers. If the alternatives are limited, the resources are scarce and more valuable. This puts the partner in a better negotiating position. The struggles of the interviewees with available partners vary. Most of them had little problems with finding a good partner because it was either recommended by someone else or the options were very limited. One of them is often the partner that needs to be chosen and is growing in its own identity.
- 8) **Geographical similarity** was mentioned earlier in the choice whether or not firms decide to partner. In the interviews it was mentioned as a struggle, the geographical dissimilarity brought struggles of its own. The cultural difference created by the distance between the partners was mostly a trial for communication.
- 9) **Scalability** is the ability to scale thanks to partners. It is often a tactic for start-ups to grow faster, but can be used by any company who lacks resources to scale on its own. One of the interviewees mentioned that it is faster than raising capital yourself and that collaborating is the way to go.

From the interviews, two new factors were introduced in the theory.

- 10) **Complementary mindset and/or identity**
- 11) **Getting a partner recommended through someone else**

## DEFINING THE RELATIONSHIP

It is important to talk about the relationship before formally starting it.

- 1) Setting **clear goals** is important so that the stakeholders are a unity. In general they should share a similar vision and mission (Fachrunnisa et al., 2012). Together with setting clear roles (number 2), setting clear goals was mentioned often as important for collaboration.
- 2) The **roles** in the collaboration should be clear as well.
- 3) **Measurement methods** to look at the **performance** of the collaboration, in any way possible, is a challenge. It is easier for inter-firm partnerships because companies are used to use such systems, but finding the right method can still be hard. Decisions need to be made about what is important and how you want to mathematically measure that (Yoon et al., 2017).
- 4) The relationship should also include how the partners will **share the risks and benefits** of whatever comes out of the collaboration.
- 5) The **distribution of resources** implies that each party knows what to expect from the other in terms of resources, both tangible and intangible. In the classic contractor relations, often the customer has tangible resources and the contracted partner provides intangible resources such as knowledge, skills and expertise.

To translate these factors to questions that should be answered to define a relationship:

- 1) Why are we setting up a partnership? What do we want to achieve?
- 2) Who is responsible for what?
- 3) How do we measure the success of our partnership?
- 4) How will we share the risks? How do we share the benefits?
- 5) Who provides which resource?

## MANAGING THE RELATIONSHIP

Managing the relationship during the collaboration also has its vital effects on the collaboration as a whole.

- 1) ~~The collaborative leader~~ was moved to dimension 'Those internally responsible' under the category 'Prerequisites', because of the interviews.
- 1) The chosen **methods of solving common issues** can influence the outcome of a partnership in the sense that differences should be dealt with in a constructive way for both parties. This method can be spoken about in defining the relationship, but are placed under managing it because often it only comes up when an issue arises.
- 2) Some firms have their own vested interest which are not necessarily in line with the public interest of a more sustainable sector (Niesten et al., 2016). **Bringing together these opposing values** is often a challenge. In the interviews we learned that firm size plays a role here, since the project team of the bigger company does not per se represent the opinion or needs of the whole company. This can create problems in the long-term.
- 3) "Trust is maintained and sustained by the ability of members to **communicate** with each other" (Fachrunnisa et al., 2012). Communication is of great importance in any collaboration, long-term or short-term, big firm or small firm. The partners should be willing to accept input and advice from one another (Wassmer et al., 2012). Every interviewee mentioned this factor as important.
- 4) There needs to be a certain level of **mutual trust, openness and transparency**. A partnership based on secrets and deception will not last. The interviews also mentioned openness to innovation and experimentation, which has been mentioned in the literature, as essential. Both parties should be open to new experiences and trial-and-error. Experimenting together with the partner is a key to build trust and a long-standing relationship. This was also mentioned by every interviewee.
- 5) **Interdependency** means that the firms depend on each other to create something, if this interdependency is in balance the partnership functions better. If the partners are interdependent on each other, such as the focal firms seeks knowledge and the partner seeks financial compensation, the chances that a partnership will succeed.

## KNOWLEDGE MANAGEMENT

For this subject, we refer to “5.5.2 Informal and semi-formal collaboration forms with appropriation strategies”. Knowledge management is straightforward.

- 1) You need to choose how to handle **knowledge spillovers**. This spillover can be either about the relation-specific knowledge or not. There are many ways a firm approach this, either it prefers flexibility and speed during the collaboration or a slower but safer approach. Using trust as an appropriation strategy works fast, but may backfire in the future. While formal appropriation strategies can slow the process as a whole.
- 2) **Knowledge transfer** becomes particularly important when the partnership is not a one-off event. Torugsa et al. (2016) imply that shared knowledge between two firms creates a state of interdependency, which was talked about earlier in “Managing the relationship”.
- 3) The **IT capability** of both firms can potentially play a huge role in the collaboration. Especially in times of lockdown, where the business world needs to function almost completely online. If both parties have sturdy IT systems while still being flexible about the introduction of new software and/or hardware, the chances of a smooth and qualitative partnership increase. This was never mentioned in any of the interviews or listed as to be important.

## 6 CONCLUSION

What influences an inter-firm collaboration on sustainability with at least one SME? This question was looked at through five subthemes: theoretical frameworks, prerequisites, motivations and incentives, forms and influencing factors on a collaboration relationship.

### 6.1 SUMMARY OF THE RESULTS

In section 5.1 and 5.2 we researched **important authors** and **the existing theoretical frameworks** to gain background knowledge on the existing literature. Here several links were found between the frameworks (see figure 2). From the model merging the theoretical frameworks we see that important factors include brand image, the opinion of stakeholders, exchanged resources and available resources of the focal firm and the creation of value as well as which value is created. There are four categories in the frameworks, namely macro frameworks on sustainable partnerships, micro frameworks on partnerships, value creation and environmental product innovation versus environmental process innovation. The macroframeworks are Ecological Modernisation, Governance Theory and Sociotechnological Change theory, these look at sustainable partnerships on a society scale. There are six micro frameworks that look at the relations between two partners. Institutional Theory, Stakeholder Theory, Resource Dependence, Resource Based View, Network Theory and Agency Theory and Transaction Cost Economics are the six micro frameworks. There are four values that can be created in a partnership, namely Associational Value, Transferred Resource Value, Interaction Value and Synergistic Value. Lastly there are two types of innovation that can come from sustainable partnerships. A sustainability-oriented partnership can result in environmental product innovation, environmental process innovation or a mix of both.

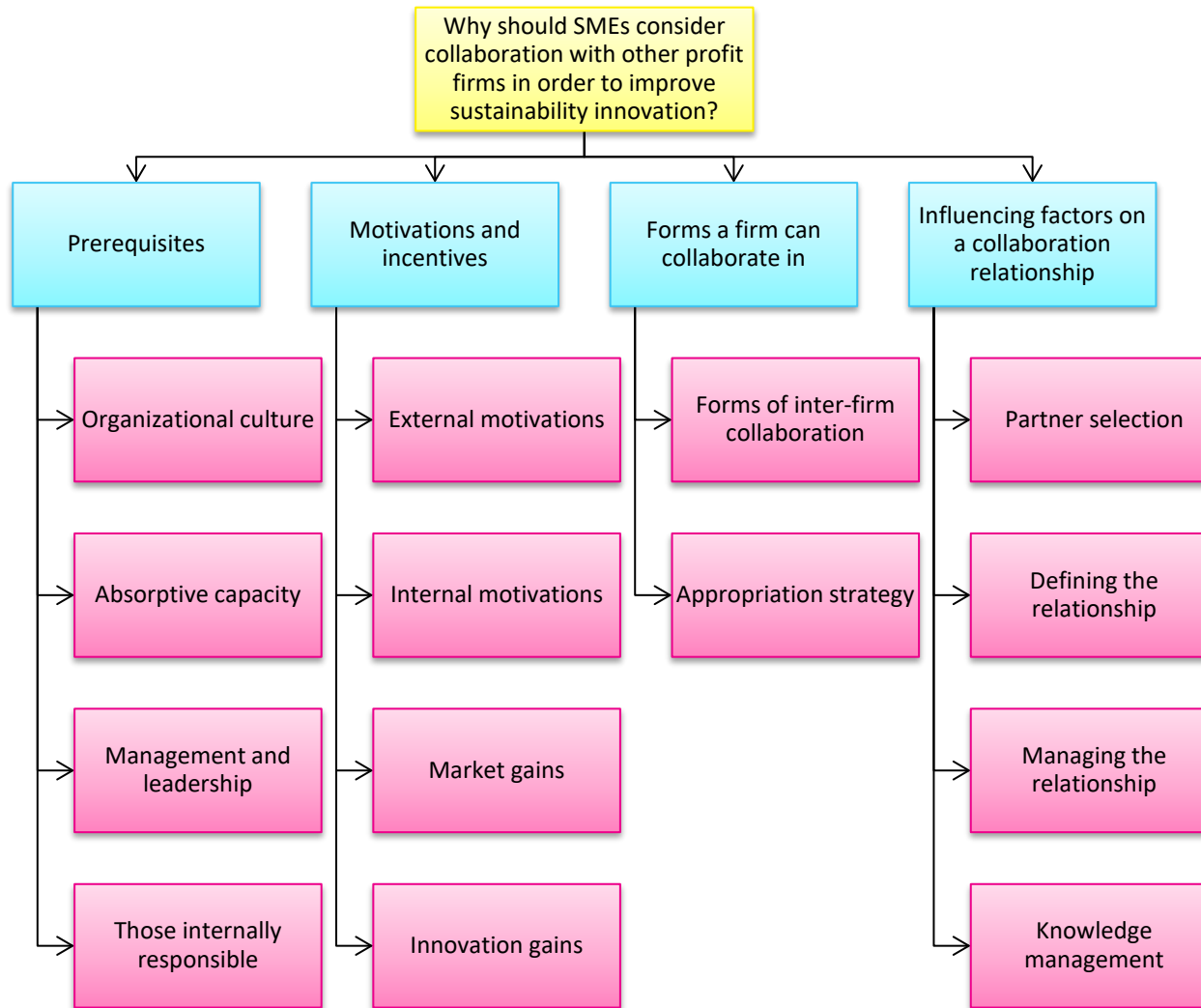


Figure 4 Summary of the structure of the grounded theory table, showing only the research question, the categories and the dimensions (section 5.3 – 5.6), leaving the codes and quotations out.



In section 5.3, we talked about the category **prerequisites**. We found four dimensions here, namely 'Organizational culture', 'Absorptive capacity', 'Management and leadership' and 'Those internally responsible'. A good *organizational culture* includes a good working climate, a clear strategy formulation, interaction of the organization with other stakeholders, a mindset and internal knowledge sharing. The *absorptive capacity* is the capacity of the company in which it can use external knowledge created by or learned from partners. There are three factors that make up absorptive capacity. If a company invests in R&D, it is a sign it can handle new knowledge properly. Human capital means having skilled employees to handle knowledge and lastly HR plays a role as in hiring and keeping the good human capital. *Management and leadership* originally had four components from the literature, but the fifth was added after the interviews. To obtain a good sustainability-oriented collaboration, the employees should be aware of their firm's intention and their role to play. Management and leadership should also fight the resistance of employees or other management. Ecopreneurship was also an important factor in the interviews as well, because several interviews mentioned that ecology and sustainability were a part of their firm's DNA. Collaborative capability is the ability of a firm to partner with another firm. The newly added factor is the ability and willingness to invest. From the interviews we saw that it depends on who receives the most knowledge and/or expertise to see if either the focal firm or the partner should be making the investments. This effect can be attributed to the nature of the partnerships, which were mostly classic contractor relations. After the interviews, the former dimension 'Project team' – now '*Those internally responsible*', was changed quite a lot. This aspect put forward someone who is internally responsible for the collaboration, which includes a project team that is aware of the subject and a collaborative leader who can be a specific employee in bigger firms, but often is the CEO in smaller organisations. Overall, in the literature, the most important codes seem to be collaborative capability, internal knowledge sharing and having a collaborative leader.

**Motivations and incentives** (section 5.4) also counted four dimensions, 'External motivations', 'Internal motivations', 'Market gains' and 'Innovation gains'. *External motivations* included regulatory pressure and incentives, which was a financial help to certain interviewees. It also included stakeholder pressure, because their social environmental awareness rises, and they wish to see it raised in firms as well. Another external motivation can be a gap created in the market (by the downsizing of another firm), this gap could be filled by firms collaborating. A firm can also wish to invest in sustainability partnerships because of *internal motivations*. This consists of six factors, the environmental performance of the company, greening the internal processes, reducing waste or valorising it, obtain cost reductions, use resources optimally and fill in the own firm's resource or capability gaps. The last was mentioned often in the interviews, because firms needed partners to gain knowledge and expertise or develop a new product. This will be talked about more later. The research indicates that there are five possible *market gains*. The first four stem from the literature study, the last one comes from the interviews. Being able to ask a higher product price, accomplish higher product quality or getting a higher turnover is the first market gain. The second is a better firm image, which includes getting perceived better by stakeholders. This was yet again an important aspect to the interviewees and/or their partnerships. Creating legitimacy of sustainability and its technologies by the focal firm using another firm's product or process, is (in)directly supporting the use of the technology or sustainability in general. The competitive gain by going sustainable through partnerships is the fourth aspect. The fifth gain is reaching new customers segments which could not be reached before. Lastly, there are two *innovation gains* that are probable. This relates to the environmental product and process innovation talked about in section 5.2. The two innovation gains are either knowledge and expertise or the development of a new product or a combination of both. From every interview at least one of these gains was mentioned. Cost reduction, competitive advantage, and stakeholder pressure are the most mentioned motivations in the literature.

There are several **forms possible for firms to collaborate in** (section 5.5), an overview can be found in table 6. There were only two which were mentioned in the interviews, namely outsourcing/contractor relations and licensing. There are multiple possible explanations for this, but none can be confirmed. These could be the small interview sample, three out of four interviewees were very small companies and small companies work differently than bigger companies, the Belgian SME culture and so on. There are also the appropriation strategies. The collaborations generally start on trust and when enough trust is built up, it transforms into a more formal collaboration with things like NDA's and exclusivity-contracts.



In section 5.6 this thesis researched the **factors that influence a collaboration relationship**. This has four dimensions, 'Partner selection', 'Defining the relationship', 'Managing the relationship' and 'Knowledge management'. In the *partner selection* phase, there are eleven factors that could be taken into account. Choosing a partner with complementary resources, both tangible or intangible, is seen as very important in both literature and interviews. Diversity can play a role in collaborations, but was not mentioned in any of the interviews. R&D ability of the other company implies the amount of knowledge the focal firm can obtain. Which partner has the most control in the relationship or how it is managed can influence a collaboration in every way. This can sometimes be related to the firm size, another factor of partner selection. The bigger partner has more control, that is what we learned from the interview. When the number of available partners is high, the focal firm can choose more carefully versus the other way around. Geographical similarity, or in the case of the interviewees' case geographical dissimilarity, is shown to have an impact on a collaboration. Scalability can also influence the partner choice, because some partner firms offer the opportunity for the focal firm to scale. There were two new factors added thanks to the interviews, which make up the last two factors of the partner selection. The partner should have a complementary mindset and/or identity when compared to the focal firm, so in this thesis, a sustainable mindset and/or identity (ecopreneurship). Sometimes the partner gets recommended by someone who knows a potential partner, which increases the trust and speeds up the choosing process. *Defining the relationship* includes five factors. Setting clear goals and roles are the first two factors. These two factors contribute to a shared vision and mission. The performance of a collaboration has to be measured by some method, which the literature often mentions as a challenge. The firms should want to share the potential benefits and risks as well. The distribution of resources, who gives what and when, can carry importance to define the relationship. During the sustainable partnership, the *relationship should be managed*. From the literature, the collaborative leader factor was placed here, but as mentioned before, now is under the dimension 'Those internally responsible'. There can be methods of solving common issues in place and bringing together opposing values. The factors that were deemed as important in the interviews were communication, mutual trust and transparency. The last factor of relationship management that we found is interdependency. If the partners are dependent on each other, the chances of having a successful collaboration can potentially rise. The last dimension is *knowledge management*. Knowledge management includes three factors. Knowledge spillovers can be a risk in any collaboration, this is why knowledge appropriation (see section 5.5) is important to prevent these spillovers. Knowledge transfer can be a key to collaboration, cross-pollination was identified in the interviews as important. The last factor of knowledge management is IT capability, which could be more relevant in times of COVID-19, yet was never mentioned in the interviews. In the literature the most mentioned codes of this category seem to be communication, knowledge spillovers, and knowledge transfer.

## 6.2 CONCLUSION OF THE INTERVIEWS

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In this section we will briefly look at the most important factors according to the interviewees. In 'Prerequisites of the focal firm' (the interviewees themselves), all the interviewees mentioned ecopreneurship. Three out of four interviewees also mentioned mindset, interaction of organization with other stakeholders, awareness of the employees and having a collaborative leader. In 'Prerequisites of the partner firm', all of the interviewees mentioned collaborative capability and having a collaborative leader. Three out of four interviewees also mentioned mindset, and ability and willingness to financially invest. Overall, the ability and willingness to invest, having a collaborative leader, and the mindset are the most important fundamentals in general. In 'Motivations and incentives', they all mentioned resource and capability gaps and gaining knowledge and expertise. In 'Forms a firm can collaborate in', mostly contractor relations/outsourcing were mentioned, and one interviewee mentioned licensing. Complementary resources, communication and mutual trust, openness and transparency were also brought up by all the interviewees in 'Influencing factors on collaboration relationship'.

However, when interpreting these results and later the recommendations, one should take some limitations into account when looking at the methodology of this thesis. Firstly, grounded theory can potentially suffer from the subjectivity of the data. We tried to avoid this by using mostly high-quality sources such as papers and scientific articles. Secondly, it is also difficult to detect or to prevent researcher-induced bias.<sup>3</sup> Thirdly, the interviews were conducted using convenience sampling. There are some risks related to convenience sampling, namely sampling bias and the sample cannot be representative for the entire Flemish SME population. The sample is also relatively small, which adds to the risk that the interviews cannot be representative for the entire Flemish SME population.

## 6.3 RECOMMENDATIONS FOR STAKEHOLDERS

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The **SMEs** can now choose to opt for inter-firm sustainable collaboration. Through the motivations and incentives, they could list up why they should collaborate and start making explicit goals and KPIs in order to achieve them. The forms in which my interviewed Belgian SMEs collaborate are not diverse. This can be because 3 out of 4 interviewees are from a small and/or start-up environment. The bigger SMEs can have more financial and/or in-house knowledge to look into other collaboration forms. The SMEs who provide sustainable knowledge and expertise as a service, especially on sustainability, can now look to approach their potential customers using different motivations and incentives.

Regulatory pressure and incentives are mentioned regularly in the literature. This is why the **government** should invest in inter-firm collaboration on sustainability by providing subsidies or other financial backings. On the other hand, the environmental law could induce this collaboration as well. It would be good to map and look at successful examples of sustainability-oriented collaborations between firms and use these as a reference.

Everyone, in their role as **stakeholder**, and as seen in both literature and practice, can make demands about where and how your product is made or how your service is provided. You can ask for more sustainability, because it is no longer a trend. It is becoming the norm and a must.

Other **researchers** could invest in more interviews with a bigger sample of Flemish SMEs to capture the Flemish SME culture, especially on the topic of this thesis. Some factors will have a bigger influence than others, as this thesis tried to show with a small sample. For example, does a firm need all the prerequisites in order to collaborate and if not, which are the base requirements? Are these different for different sectors? This thesis provides a framework to offer researchers a base to collect in-depth knowledge and for firms to look into sustainability-oriented innovation in combination with partnerships.

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<sup>3</sup> 'DISADVANTAGES OF GROUNDED THEORY'. Accessed 10 June 2020.  
[http://wileyvws.com/wiley\\_sites/9781405183376/disadvantages\\_of\\_grounded\\_theory.htm](http://wileyvws.com/wiley_sites/9781405183376/disadvantages_of_grounded_theory.htm).

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**8 APPENDIX**

**8.1 EFFECTS ON COLLABORATIONS – INDIVIDUAL MODELS**

**Conceptual Model of External Relationship Influences, Management Processes, and Effects in Small Business**

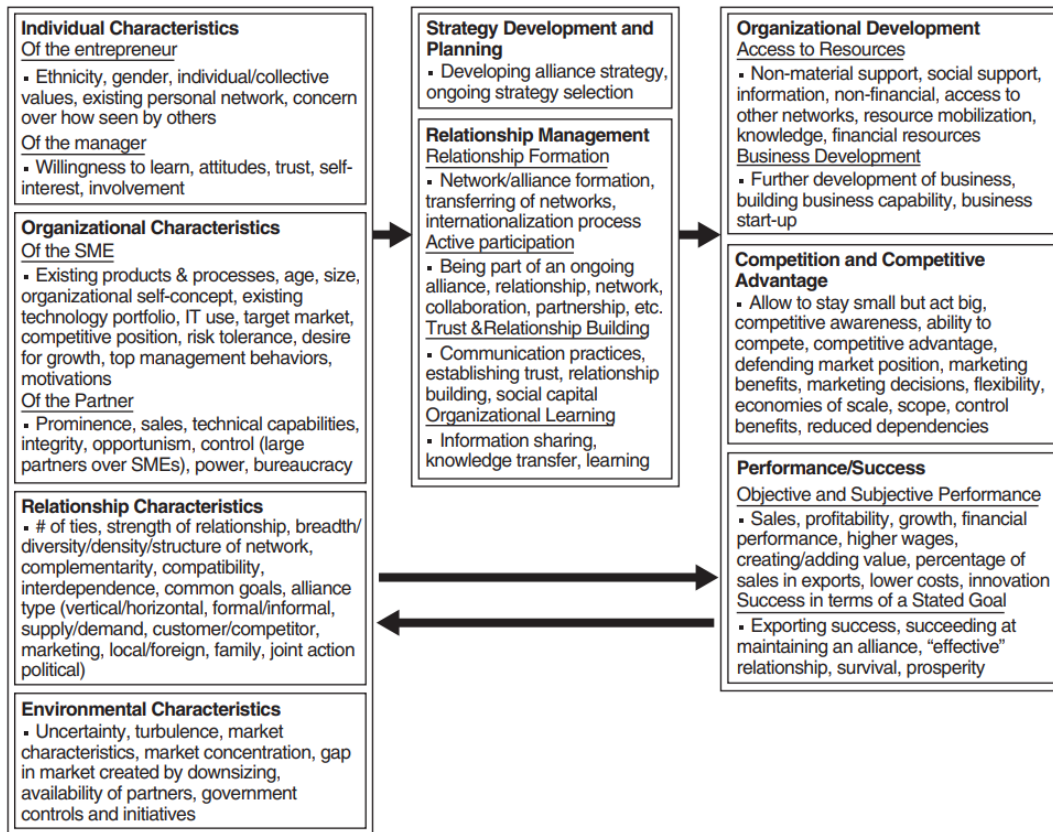


Figure 5 Street and Cameron (2007)

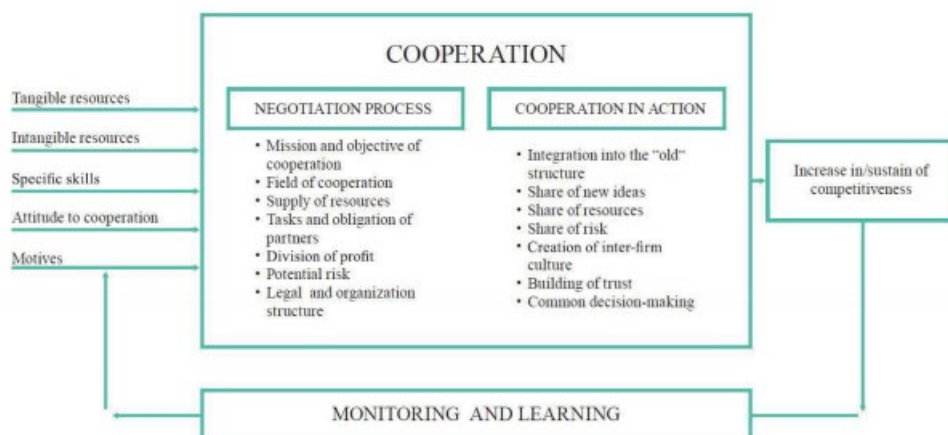


Figure 6 Zizlavsky and Estélyiová (2013)



**Table 1.** Success factors for collaboration.

| Perspective                      | Success Factor                                      | Content and Operational Definition  | Author           |
|----------------------------------|---|---|------------------|
| Planning stage                   | Setting of clear goals                              | - Setting of clear goals at the planning stage.<br>- Supplementary purposes.  | [36-38]          |
|                                  | Distribution regulation for collaboration results   | Prescribe issues related to distribution in advance, and prevent technical knowhow from leaking out   | [39]             |
|                                  | Methods of solving common issues                    | Refrain from using harsh methods such as persuasion, domination and arbitration to solve conflicts  | [22,28]          |
|                                  | Governance: clear role-setting                      | Main agents and strategies about role-setting of collaboration  | [40]             |
|                                  | Governance-defining performance measurement methods | Main agents about methods to measure performance of collaboration   | [41]             |
| External environment             | IT capability                                       | Integration through an information system   | [41]             |
|                                  | Geographical Similarity                             | Possibility of collaboration increases when partners are geographically more close  | [41]             |
|                                  | Knowledge management system                         | Knowledge management system, including knowledge asset management   | [38]             |
| Characteristics of collaboration | Collaboration Culture                               | Fair collaborative atmosphere that enables partners to overcome differences between them  | [29,36,42-44]    |
|                                  | Confidence  | - Perception that the partner will be honest.<br>- Belief that the core competence will not leak out through collaboration.<br>- Belief that collaboration will bring benefits. | [16,22,41,45-48] |
|                                  | Immersion   | - Formation of a long-term relationship.<br>- The will to invest in the collaborative relationship in both partners.  | [41,45]          |
|                                  | Communication                                       | Information exchange, participation, mutual communication, and free flow of information   | [16,22,45]       |
| Characteristics of a partner     | Complementarities                                   | Mutual dependence and possession of supplementary technology and ability  | [29,36]          |
|                                  | Technological ability                               | Ability to develop innovative new technology  | [41]             |
|                                  | Experience in Collaboration                         | Positive experience in collaboration tends to have a positive influence on future collaboration   | [16,33,45]       |
|                                  | Diversity   | Diversity of gender, age, and education Levels  | [34,49]          |
|                                  | Knowledge Absorption                                | Ability to absorb new things and integrate new knowledge  | [50,51]          |
|                                  | Facilitator   | Existence of an innovative broker or an Intermediary  | [40,52,53]       |

Figure 7 Yoon et al. (2017)

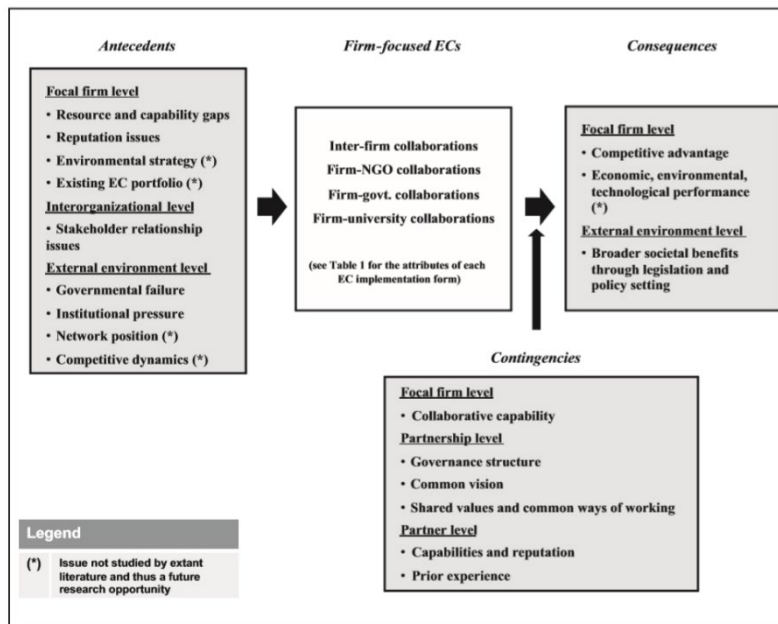


Figure 8 Wassmer et al. (2012)

## 8.2 GLOSSARY

| <b>Word</b>  | <b>Definition</b>   |
|--|---|
| <b>Big firms</b>   | Naturally deduced from the definition of SMEs, a big firm is a firm with more than 250 people employed. It has an annual turnover over EUR 50 million and/or a balance sheet of more than EU 43 million.  |
| <b>Collaboration</b>   | "A process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible." (Gray, 1989)  |
| <b>Governance</b>  | "means by which order is accomplished in a relation in which potential conflict threatens to undo or upset opportunities to realize mutual gains" (Williamson, 1998, p. 37).  |
| <b>Collaborative forms (in context of economic governance forms)</b> | "Legally autonomous entities doing business together, mutually adjusting with little help from the price system, and sharing or exchanging technologies, capital, products, and services, but without unified ownership" Ménard, 2004, p. 348)  |
| <b>Focal firm</b>  | The firm that decides to collaborate. The company that the focal firm collaborates with, will be mostly referred to as partner.   |
| <b>SME</b>   | SMEs are defined by the European Commission as having less than 250 persons employed. They should also have an annual turnover of up to EUR 50 million, or a balance sheet total of no more than EUR 43 million (Commission Recommendation of 6 May 2003). <sup>4</sup>   |
| <b>Sustainability-oriented innovation</b>                            | <p>= Environmental innovation, "Sustainability-oriented innovations are new or enhanced products, services or processes that reduce the negative environmental and social impact while steadily increasing the success of the company (Schaltegger &amp; Wagner, 2008, 2010; Wüstenhagen et al. 2008). To be innovative means to provide organizational and technical improvements that can be sold successfully in the marketplace (Schaltegger &amp; Wagner, 2010). As SOI considers the whole physical life-cycle of products and services, both product and process innovation are relevant (Hansen et al., 2009; Paramanathan et al., 2004; Wagner, 2009). Moreover, SOI not only deals with incremental innovation, but also with more radical innovations such as entirely new business models (Hansen et al., 2009; Paramanathan et al., 2004).</p> <p>"With consideration to existing literature on innovation in the context of sustainability, a multitude of researchers has generated a myriad of competing terms, which have influenced each other and thus strongly overlap. Central terms include sustainability innovation (Hockerts, 2003; Schaltegger &amp; Wagner, 2008), sustainable innovation (cf. Wüstenhagen et al., 2008), CSR-driven innovation (Hockerts, 2009), sustainabilityrelated innovation (Wagner, 2008; Wagner &amp; Llerena, 2008) and sustainability-oriented innovation (Fichter &amp; Paech, 2004; Hansen et al., 2009; Paech, 2005). Based on this existing research, we consider a relative improvement of products or processes towards sustainability as most important, that is, we speak of innovation as a process or direction towards corporate sustainability. Consequently, we find the term sustainability-oriented innovation most suitable and define it as: an improvement (and/or introduction) of a product, technology, service, process, management technique, or business model which, in comparison to a prior version and based on a rigorous and traceable (comparative) analysis, has a positive net effect on the overall capital stock (economic, environmental, and social). Tradeoffs between economic capital on the one hand and environmental and social capitals on the other should only be pursued if the reduction of either one side is compensated through a sufficiently high increase of the other." (Klewitz &amp; Hansen, 2011)</p> |

*Table 7 Glossary*

<sup>4</sup> Eurostat. "Small and medium-sized enterprises (SMEs)". Geraadpleegd 5 januari 2020. <https://ec.europa.eu/eurostat/web/structural-business-statistics/structural-business-statistics/sme>.

### 8.3 GROUNDED THEORY TABLE

| Category  | Dimension                                     | Code  | Quotation + source   |
|---|---|---|--|
| Prerequisites / Organization's own resources and capabilities | Organizational culture                        | Working climate                                     | "The organizational literature suggest that a strong organizational culture can contribute to better performance because it plays an important role in determining the working climate, strategy formulation, and the way organizations interact with customers, competitors and suppliers." (Van Lancker et al., 2016)  |
|   |   | Strategy formulation                                | "The organizational literature suggest that a strong organizational culture can contribute to better performance because it plays an important role in determining the working climate, strategy formulation, and the way organizations interact with customers, competitors and suppliers." (Van Lancker et al., 2016)  |
|   |   | Interaction of organization with other stakeholders | "The organizational literature suggest that a strong organizational culture can contribute to better performance because it plays an important role in determining the working climate, strategy formulation, and the way organizations interact with customers, competitors and suppliers." (Van Lancker et al., 2016)  |
|   |   | Mindset   | "A culture conducive to innovation is a prerequisite for the success of (open) innovation efforts. Creativity, receptiveness to new ideas, risk taking, and an entrepreneurial mindset are all important attributes of such a conducive innovation culture. These attributes can be supplemented by a stern recognition of the collective nature of innovation efforts, an attitude of openness, and a willingness to strive for win-win relations with stakeholders." (Van Lancker et al., 2016)  |
|   | Absorptive capacity / Organisational learning | R&D   | "In the SMEs context absorptive capacity can be embodied both in formalised R&D activity and in HR elements." (Muscio, 2007)<br><br>"In this context, cooperation has gained an important role in the innovation process at the firm level, since innovation cooperation activities are considered an efficient means for the industrial organization of complex R&D and innovation processes." (de Faria et al., 2010)  |
|   |   | Skilled human capital                               | "The skills, training and experience of SMEs' human capital represent the essence itself of their knowledge base and contribute extensively to the overall capability to absorb external knowledge." (Muscio, 2007)<br><br>"Employees' education level, exports share, and appropriability have a significant impact on the probability of cooperation." (de Faria et al., 2010)   |
|   |   | HR  | "... one should consider learning capabilities embodied in their human resources (HR)." (Muscio, 2007)   |
|   | Management and leadership                     | Awareness of the employees                          | "In addition awareness of being part of an innovation system plays an important role in 'detecting' potential partners." (Muscio, 2007)<br><br>"To increase the awareness of the importance of innovation among employees, leaders should demonstrate this importance in every decision." (Van Lancker et al., 2016)   |
|   |   | Fight resistance                                    | "Also, it is the responsibility of leaders to find and fight any resistance to change in the organization." (Van Lancker et al., 2016)   |
|   |   | Ecopreneurship                                      | "One interesting exception from the rule seems to be the 'practice' of ecopreneurship which [...] seem to be linked to radical new ways of doing business." (Klewitz & Hansen, 2011)   |
|   |   | Collaborative capability /                          | "A firm's "collaborative capability" is the key success factor for ECs, irrespective of the implementation form (Austin, 2003; Dyer, Kale, & Singh, 2001). This capability includes a firm's ability to adequately screen, assess, and select partners (Dyer et al., 2001; Gray, 1985; Gray & Wood, 1991) in light of supporting an EC's particular objectives (Mendelson & Polonsky, 1995). Among the aspects of collaborative capacity that firms need to consider are whether potential partners have the requisite resources and credibility |

|                            |                   |  |  |
|----------------------------|-------------------|--|--|
|                            |                   | Relational capability                                    | to support the EC (Hendry, 2003; King, 2007; Rangan et al., 2006) and have established or can establish and maintain common values and approaches for collaborating effectively (Glasbergen & Groenenberg, 2001; Rondinelli & London, 2003).” (Wassmer et al., 2012)<br><br>“Relational capability is the ability to create and manage the interorganizational relationships between the different relevant stakeholders. This includes the capability of the firm to quickly sort out the level of compatibility and complementarity with other stakeholders, its knowledge on effective communication patterns, on negotiation skills, and on conflict management techniques.” (Van Lancker et al., 2016)  |
|                            | Project team      | R&D team   | “First, an R&D team with access to interdisciplinary knowledge, with both technological and commercial knowledge is recommended. The best way to realize this is to work with cross-divisional teams.” (Van Lancker et al., 2016)  |
|                            |                   | Internal knowledge sharing                               | “As a result, the term knowledge sharing is employed to refer to an ongoing process based on certain inputs, processes, outputs and outcomes which defines a system. Other authors argued that the motive for knowledge sharing, and thus information sharing, relates to certain attitudes and values (Abrams et al., 2003;Bock & Kim, 2002;Yang, 2008) while others proposed that knowledge sharing is a collaborative process (Santoro, Borges, Rezende, 2006;Skyrme 1999;Yang 2007). In addition, an analysis of the literature identifies trust as the foundation for enabling information and knowledge sharing behaviours (Abrams et al., 2003;Bock & Kim, 2002;Choi & Hilton 2005;Powell, Koput & Smith-Doerr, 1996).” (Santoro et al., 2006)  |
| Motivations and incentives | External pressure | Regulatory pressure and incentives                       | “This could lead to a critical reflection of such regulatory governance if more positive outcomes are reported for market-based governance.” (Seuring & Gold, 2013)<br><br>“This could be a promising direction for future policy development given the fact that public authorities can stimulate environmental innovation based on the Porter hypothesis (Porter and Van der Linde, 1995). It could be supposed that policy intervention to alter the role and influence of public authorities or intermediaries could promote environmental innovation among the firms.” (Grekova et al., 2013)<br><br>“Central message of the review is that SME peculiarities require specific actions, with reference to policy initiatives, to promote SOI (Sustainable Oriented Innovation) in SMEs.” (Klewitz & Hansen, 2011)<br><br>“Targeted government programs and policies increase alliance formation (AhwirengObeng 2001; Rosenfeld 1996), and government institutions can act as intermediaries to encourage the development of trust between alliance members (Davenport, Davies, and Grimes 1999).” (Street & Cameron, 2007)  |
|                            |                   | Stakeholder pressure/<br>Social environmental awareness  | “Firms have changed their product portfolios, production processes and supply chains in response to government regulations, demand from consumers and pressures from NGOs (Åhlström and Sjöström, 2005; Hoejmoose et al., 2012).” (Nielsen et al., 2016)<br><br>“The requirements concerning environmental performance of companies typically move upstream in the value chain, because the main contractors involved in environmental improvement become increasingly aware of the environmental impacts of the raw materials and components of their products. This will eventually lead to a situation where even the smallest companies in the value chain are required to improve their environmental performance.” (Pesonen, 2001)<br><br>“Institutional pressures” include pressure from a variety of sources, including NGOs, stakeholders, governments, and industry (Arya & Salk, 2006; Harrison, 1995; Sharma & Vredenburg, 1998). Firms use ECs to address environmental issues proactively before government-imposed threats can be made or carried out (Delmas & Montes-Sancho, 2010; Hartman & Stafford, 1998) or competitive pressure from industry peers weaken their market position (Delmas & Montes-Sancho, 2010).” (Wassmer et al., 2012) |
|                            |                   | Gap in market created through downsizing of another firm | “It has also been suggested that downsizing within the industry creates gaps that can be filled by alliances of smaller businesses (Sonfiled 1995).” (Street & Cameron, 2007)  |

|                              |  |   |  |
|------------------------------|--|---|--|
|                              | Internal pressure  | Environmental performance                                   | <p>"The requirements concerning environmental performance of companies typically move upstream in the value chain, because the main contractors involved in environmental improvement become increasingly aware of the environmental impacts of the raw materials and components of their products. This will eventually lead to a situation where even the smallest companies in the value chain are required to improve their environmental performance." (Pesonen, 2001)</p> <p>"Collaboration enhances sustainable benefits by creating legitimacy of sustainable technologies, reducing waste and improving environmental and social performance of firms." (Niesten et al., 2016)</p>  |
|                              |  | Internal processes  | <p>"Our finding that environmental collaboration is likely to generate sustainable process improvements primarily on the side of the seller corresponds to the findings from the case studies of Hall, 2000." (Grekova et al., 2016)</p> <p>"Only Chiou et al. (2011) examined how environmental collaboration with suppliers induces improvements of in environmental sustainability of internal processes, such as increased adoption of clean technologies, processes with lower energy burden and material reuse, recycling and manufacturing." (Grekova et al., 2016)</p>   |
|                              |  | Reduce packaging, pollution, waste... or valorize the waste | <p>"They [Aschemann-Witzel et al., 2017] identify different initiatives aimed at reducing food waste, such as supplying information on how to reduce waste, redistributing food and promoting changes in the supply chain." (Niesten et al., 2016)</p>   |
|                              |  | Cost reduction  | <p>"In addition, firms proactively change their business processes when they experience that pursuing environmental and social goals can lead to cost reductions and enhance their competitive advantage." (Carroll and Shabana, 2010; Niesten et al. 2016)</p> <p>"Competitive advantage results from decreasing costs through efficiency improvements and/or increasing revenues from new products and markets." (Hartman &amp; Stafford, 1997; Rondinelli &amp; London, 2003; Sharma &amp; Vredenburg, 1998; Yaziji, 2004; Wassmer et al., 2012)</p> <p>"Examples of such benefits are cost savings (Christmann, 2000; Hart and Ahuja, 1996) due to more efficient resource usage, preventing spills and environmental liabilities (Klassen and McLaughlin, 1996), increased consumer perception of 'green products' added value and their inclination to pay a premium for environmentally friendly products (Ambec and Lanoie, 2008), improved market share (Klassen and McLaughlin, 1996), and a good image of the producer (Miles and Covin, 2000)." (Grekova et al., 2013)</p> <p>"Only Chiou et al. (2011) examined how environmental collaboration with suppliers induces improvements of in environmental sustainability of internal processes, such as increased adoption of clean technologies, processes with lower energy burden and material reuse, recycling and manufacturing." (Grekova et al., 2016)</p> |
|                              |  | Optimal resource utilization                                | <p>"Examples of such benefits are cost savings (Christmann, 2000; Hart and Ahuja, 1996) due to more efficient resource usage, preventing spills and environmental liabilities (Klassen and McLaughlin, 1996), increased consumer perception of 'green products' added value and their inclination to pay a premium for environmentally friendly products (Ambec and Lanoie, 2008), improved market share (Klassen and McLaughlin, 1996), and a good image of the producer (Miles and Covin, 2000)." (Grekova et al., 2013)</p> <p>"It has become clear that such changes in in large industries should not be led by only one company, but should only occur when several market players and stakeholders collaborate in order to maximize the performance of resource utilization for long-term sustainability." (Yoon et al., 2017)</p> <p>"Only Chiou et al. (2011) examined how environmental collaboration with suppliers induces improvements of in environmental sustainability of internal processes, such as increased adoption of clean technologies, processes with lower energy burden and material reuse, recycling and manufacturing." (Grekova et al., 2016)</p>  |
| Resource and capability gaps | <p>"As no one firm possesses all the necessary resources to exploit every opportunity and neutralize every threat in its external environment, firms frequently use nontraditional market mechanisms such as interorganizational collaborations to obtain preferential access to resources they do not possess (Gulati, 2007)." (Wassmer et al., 2012)</p> |   |  |

|  |                  |   |   |
|--|------------------|---|---|
|  |                  |   | <p>"Within this research, organizational development generally refers to the small firm's ability to access needed resources and, to a lesser extent, business development." (Street &amp; Cameron, 2007)</p>   |
|  | Market gains     | Product price, turnover or product quality                          | <p>"To conclude, ECs (environmental collaborations) implemented through interfirm collaborations can be seen as vehicles to realize economic value through addressing environmental problems." (Wassmer et al., 2012)</p> <p>"Competitive advantage results from decreasing costs through efficiency improvements and/or increasing revenues from new products and markets. (Hartman &amp; Stafford, 1997; Rondinelli &amp; London, 2003; Sharma &amp; Vredenburg, 1998; Yaziji, 2004.)" (Wassmer et al., 2012)</p>   |
|  |                  | Maintaining and/or increasing firm image                            | <p>"In other words, the results showed that the more the investments in the green core competences of firms, the better are their green product innovation performance, green process innovation performance, and green image." (Chen, 2008a)</p>   |
|  |                  | Legitimacy creation of sustainability and its possible technologies | <p>"Only Chiou et al. (2011) examined how environmental collaboration with suppliers induces improvements of in environmental sustainability of internal processes, such as increased adoption of clean technologies, processes with lower energy burden and material reuse, recycling and manufacturing." (Grekova et al., 2016)</p> <p>"Collaboration enhances sustainable benefits by creating legitimacy of sustainable technologies, reducing waste and improving environmental and social performance of firms." (Niesten et al., 2016)</p> <p>"Furthermore, the adoption of sustainable technologies can be accelerated when they are implemented in different sectors, and cross-sector collaboration between firms will therefore enable the diffusion of sustainable innovations (Van Tulder et al., 2016)." (Niesten et al., 2016)</p>   |
|  |                  | Competitive advantage   | <p>"In addition, firms proactively change their business processes when they experience that pursuing environmental and social goals can lead to cost reductions and enhance their competitive advantage (Carroll and Shabana, 2010)." (Niesten et al. 2016)</p> <p>"Competitive advantage results from decreasing costs through efficiency improvements and/or increasing revenues from new products and markets (Hartman &amp; Stafford, 1997; Rondinelli &amp; London, 2003; Sharma &amp; Vredenburg, 1998; Yaziji, 2004)." (Wassmer et al., 2012)</p> <p>"Innovation is key for companies to stay competitive and to successfully compete changing markets and environments. One alley of innovation with rising importance for companies is sustainability (Paramanathan, 2004; Roome, 1994; Sharma, 2002; Wagner &amp; Schaltegger, 2003)." (Klewitz &amp; Hansen, 2011)</p> <p>"Finally, proactive environmental management can provide SMEs with a competitive advantage through differentiation of their products (if the company products are ecological) [...] Thus, offering green products can permit SMEs to differentiate their product, avoiding competing on cost, where often times large companies enjoy economies of scale." (Martín-Tapia et al., 2010)</p> <p>"Thus, external collaboration is a critical means to augment the internal value chain creation activities of an organization and reinforce its competitive advantages because the locus of innovation lies not inside the firm but in the spaces between the firm and its external partners." (Yoon et al., 2017)</p> |
|  | Innovation gains | New product development   | <p>"In line with these tenets and the innovation literature, we consider IFC for innovation to be voluntary arrangements by which the collaborating firms (transactors) engage in a relationship that can lead to the development and commercialisation of new-tomarket products, involving the exchange (transactions) of previously exclusive knowledge assets specific to the relationship's purpose, and which is too expensive for partner firms to produce independently, and/or not easily accessed or acquired through market exchange (Ahuja, 2000; Teece, 1992)." (Torugsa et al., 2016)</p>  |



|                         |  |                                     |  |  |  |
|-------------------------|--|-------------------------------------|--|--|--|
|                         |  | Knowledge and expertise             | <p>“Collaboration allows a more comprehensive appreciation of environmental challenges and what sustainability entails, encouraging expertise and resource exchanges.” (Hartman et al., 2002)</p> <p>“Many studies have investigated the link between IFC and innovation performance, with results demonstrating a positive effect for enhanced learning capabilities, improved production efficiencies, lower innovation-development costs and lower market uncertainty, each of which have been shown to enhance a firm’s innovation performance (Ahuja, 2000; Harding, 2001; Powell, Koput &amp; Smith-Doerr, 1996; Zeng, Xie &amp; Tam, 2010).” (Torugsa et al., 2016)</p> <p>“SMEs do network with external organisations, overcoming their often limited internal knowledge resources.” (Muscio, 2007)</p> <p>“In other words, and as argued by Gomes-Casseres et al. (2006) firms enrolled in cooperation activities or alliances are involved in denser knowledge flows than are non-allied firms.” (de Faria et al., 2010)</p> <p>“Furthermore, environmental innovation especially requires engagement of external partners because they can provide new skills and knowledge.” (Grekova et al., 2013)</p> |  |  |
| Forms to collaborate in | Forms of inter-firm collaboration by Zizlavsky & Estélyiová (2013) | Type of cooperation                 | Typical duration   | Advantages   | Disadvantages  |
|                         |  | Outsourcing<br>Contractor relations | Short-term   | Reduction of costs and risks<br>Shorter time of implementation                                   | Dependence on partners<br>Product quality<br>Inefficient R/D                   |
|                         |  | Licensing                           | Fixed term   | Faster access to technologies<br>Lower costs of R/D<br>Faster product development                | Contractual costs and restrictions   |
|                         |  | Spin-off companies                  | Medium-term  | Expert knowledge<br>Radical innovations  | Lack of business experience<br>Risks   |
|                         |  | Research consortium                 | Medium-term  | Sharing of costs and risks<br>Combination of expertise and special equipment<br>Shared financing | Knowledge leaks<br>Follow-up differentiation                                   |
|                         |  | Strategic alliance                  | Flexible   | Low level of the bond<br>Access to markets   | Potential blocking<br>Information leaks  |
|                         |  | Joint venture                       | Long-term  | Shared know-how<br>Access to new markets   | Cultural disharmony<br>Unstable and unsure (threat of take-over or separation) |
|                         |  | Innovation networks, clusters       | Long-term  | Dynamic cooperation  | Unstable relations   |



|   |                          |  | Potential for learning and gaining of knowledge   | Cost of control and maintenance of network |
|---|--------------------------|--|---|--|
|   | Appropriation strategy   | Formal methods   | "Trademarks, (co)-patents, copyrights, non-disclosure agreements and confidentiality agreements are examples of formal methods of appropriation." (Van Lancker et al., 2016)  |  |
|   |                          | Informal methods   | "Informal methods include secrecy, the complexity of design, and the benefit of lead times or first mover advantage. Relying solely on informal appropriation methods requires a certain level of trust and will thus be more applicable in relations with familiar partners." (Van Lancker et al., 2016) |  |
| Influencing factors on collaboration relationship | Partner selection        | Complementary resources (both tangible and intangible)   | "Thus, in the context of collaboration, complementarity amongst resources is an important driver of partner selection and alliance performance." (Yoon et al., 2017)  |  |
|   |                          |  | "In their study [Kishna et al., 2017], the complementary resources of alliance partners, such as a sustainable technology, a large customer base, and substantial production capacity, facilitate the desirability and appropriateness of a technology." (Nielsen et al. 2016)                            |  |
|   |                          | "Relational rents are derived through e.g. combining complementary and related resources and capabilities, learning and knowledge sharing." (Grekova et al., 2016)   |   |  |
|   |                          | "In order to produce and successfully commercialise innovation, firms must synthesize a wide variety of expertise and knowledge produced by different complementary sources." (Muscio, 2007)   |   |  |
|   |                          | "In opposition to this commonly-held idea, our study shows that on the contrary asymmetrical relationships offer opportunities for small businesses to innovate. This kind of relationship is virtually inevitable in the context of the globalized, ultra-competitive economy, where the most dangerous posture for a small company is to remain isolated." (Perez, 2015)   |   |  |
|   |                          | "Knowledge acquisition abilities, diversity, and openness have been found to have positive effects on performance in reference to innovation." (Yoon et al., 2017)   |   |  |
|   | Diversity                | "Knowledge acquisition abilities, diversity, and openness have been found to have positive effects on performance in reference to innovation." (Yoon et al., 2017)   |   |  |
|   | R&D ability              | Ability to develop innovative new technology (Sherer, 2003)  |   |  |
|   | Collaboration experience | "In addition, Un et al. insisted that various types of R&D collaboration differ in terms of the breath of new knowledge and in the ease of access of the new knowledge. Finally, Sieg et al. discovered that it is crucial to standardize the R&D issues that enable cooperation among internal scientists, ensure appropriate issue selection, and create new solutions by which R&D issues are solved through an innovation intermediary." (Yoon et al., 2017) |   |  |
|   | Control                  | "As well, the greater the technological capabilities of partners the higher the rate of innovation of the small business (Stuart 2000),..." (Street & Cameron, 2007)   |   |  |
|   | Firm size                | "Prior experience with external partners, whether successful or unsuccessful, has been found to have an effect on future partnership outcomes (Das and Teng 1998), suggesting a reciprocal, or feedback, condition." (Street & Cameron, 2007)  |   |  |
|   |                          | "Likewise, Tranekjer and Knudsen found success factors for SMEs to include knowledge-sharing cultures, the sharing of collaboration experience, openness, and exchange collaboration." (Yoon et al., 2017)   |   |  |
|   |                          | "Previous engagement in innovation projects is also considered to be conducive for the organization's innovation skills and for the development of technological capabilities." (Van Lancker et al., 2016)   |   |  |
|   |                          | The size and prominence of the partner influence the power struggle during a collaboration. (Street & Cameron, 2007)   |   |  |
|   |                          | "For example, small firms are more likely to form cooperative arrangements than larger firms (Shan 1990)...", "If the partners have too much power and are too bureaucratic, small businesses may be unwilling to form a relationship with them (Rothwell and Dodgson  |   |  |

|  |                           |  |  |
|--|---------------------------|--|--|
|  |                           |  | 1991) as they risk losing control of their own business (Gomes-Casseres 1997).", "On the other hand, forming relationships with larger firms that have integrity and are trustworthy is associated with long-term survival of the smaller business (Meyer, Alvarez, and Blasick 1997)." (Street & Cameron, 2007)   |
|  |                           | Availability of partners   | "The sustainability of exchange relationships, at least as mediated by relations of dependence, is not solely a function of the value placed on the resources made available by exchange partners, but also by the availability of potential alternative partners." (Huxham, 1996)   |
|  |                           | Geographical similarity  | "Possibility of collaboration increases when partners are geographically close." (Yoon et al., 2017)   |
|  |                           | Scalability  | "The theoretical analysis identifies the role played by collective external economies of scale that are realised through cooperation over input activities." (Oughton & Whittam, 1997)   |
|  | Defining the relationship | Setting of clear goals   | "In order to build a competitive strength, the stakeholders need to be in a unity, with the general or similar vision and mission." (Fachrunnisa et al., 2012)<br><br>"Common vision" and "shared values and common ways of working" are also important determinants for EC [Environmental Collaboration] success..." (Wassmer et al., 2012)   |
|  |                           | Role-setting   | "Since the governance can be split into two components, clear role setting and defining performance measurement methods, the total number of success factors becomes 18." (Yoon et al., 2017)  |
|  |                           | Performance measurement methods  | "Many studies have sought to determine how to measure collaboration performance." (Yoon et al., 2017)<br><br>"Despite their growing popularity, precisely evaluating the value added of partnerships has proven difficult, partly because of the dynamic and evolving nature of cross-sector partnerships." (van Tulder et al., 2016)<br><br>Main agents about methods to measure performance of collaboration. (Sherer, 2003)   |
|  |                           | Sharing of risks and benefits  | "Collaboration implies interdependence among stakeholders, constructive handling of differences, joint ownership of decisions and collective responsibility of outcomes (Hartman et al., 1999)." (Hartman et al., 2002)<br><br>"For example, small firms are more likely to form cooperative arrangements than larger firms (Shan 1990), but in relationships between businesses of unequal sizes, the smaller firm is often asked to take on the higher level of risk (Sulej, Stewart, and Keogh 2001)." (Street & Cameron, 2007)   |
|  |                           | Distribution of resources  | "The sustainability of exchange relationships, at least as mediated by relations of dependence, is not solely a function of the value placed on the resources made available by exchange partners, but also by the availability of potential alternative partners." (Huxham, 1996)   |
|  | Managing the relationship | Finding a collaborative leader (also referred to as a fairy godmother, a facilitator, entrepreneur...) | "Collaboration requires more than just economic or technological solutions. It expects attention to relationships, decision-making fairness and leadership. The Hartman et al. article proposes collaborative leadership to get successful partnerships. These collaborative leaders are not an expert on the technical nor environmental know-how, but rather people "who have the credibility and entrepreneurial initiative to bring the right individuals, organizations, and constituents together constructively to create visions, solve problems, and reach agreements. In sum, collaborative leaders are the catalysts for stakeholder collaboration." (Hartman et al., 2002)<br><br>"For SMEs start-up or existing business, mentors can play a critical role in supporting the management teams is successfully driving the business towards sustainability." (O'Brien & Hamburg, 2014)<br><br>"Develop leaders competent in partnership skills." (Gray & Stites, 2013) |

|  |                                      |                      |   |  |
|--|--------------------------------------|----------------------|---|--|
|  |                                      |                      | "Durst and Stähle regarded the key success factors for open innovation to include relational aspects, human resources, governance, facilitators, resource supply, strategies, processmanagement, leadership, and culture." (Yoon et al., 2017)  |  |
|  | Methods of solving common issues     |                      | "Collaboration implies interdependence among stakeholders, constructive handling of differences, joint ownership of decisions and collective responsibility of outcomes (Hartman et al., 1999)." (Hartman et al., 2002)   |  |
|  | Bringing together opposing values    |                      | "The vested interests of these firms are not necessarily in line with the public interest of a more sustainable sector." (Nielsen et al, 2016)<br><br>"Often they [SMEs] lack of information and resources (as it does they do not have the economies of scale when investing in these), have no a clear vision of sustainability (as they are concerned with survival, have a patriarchal thinking (as often there is only one investor and it is in their best interest for the company to succeed) and insufficient mechanisms of learning (due to lack of time and resources)." (O'Brien & Hamburg, 2014)<br><br>"Some firms perceive environmental and economic objectives as conflicting, while others report opportunities to derive economic benefits from their efforts to reduce environmental impact." (Grekova et al., 2013)      |  |
|  | Communication                        |                      | "Trust is maintained and sustained by the ability of members to communicate with each other." (Fachrunnisa et al., 2012)<br><br>"It is also important that EC partners are willing to accept input and advice from one another when developing and managing ECs (Dutton, 1996; Glasbergen & Groenenberg, 2001; Rondinelli & London, 2003). Doing so likely helps align an EC's objectives among partnering organizations and may be necessary in several areas, including developing a collaboration's market positioning (Hartman & Stafford, 1997), transparent and defensible environmental objectives (Stafford & Hartman, 1996), agreed-upon rhetorical justifications (Livesey, 1999), and result-oriented focus around specific "win-win" outcomes (Glasbergen & Groenenberg, 2001; Hartman & Stafford, 1998)." (Wassmer et al., 2012) |  |
|  | Mutual trust, openness, transparency |                      | "Trust is maintained and sustained by the ability of members to communicate with each other." (Fachrunnisa et al., 2012)<br><br>"Many studies have found that the importance of confidence between partners is an important success factor; the types of confidence include confidence in the agreement, confidence in the partners' ability, and confidence in the mutual benefits of the project." (Yoon et al., 2017)  |  |
|  | Interdependency                      |                      | "During such IFC (Inter-Firm Collaboration), the exchange of relation-specific knowledge (assets) occurs most often via multiple exchanges over time between partner firms, rather than being a 'once-off' event; moreover, the series of transactions through which a firm's exclusive knowledge becomes shared knowledge creates a state of dependency between the collaborating firms (Williamson, 1985)." (Torugsa et al., 2016)  |  |
|  | Knowledge management                 | Knowledge spillovers |   | "Although first mover advantages and patenting can compensate for this, knowledge spillovers that benefit society and other firms remain a reason to underinvest in innovation (Beise and Rennings, 2005; Rennings et al., 2003)." (Grekova et al., 2013)<br><br>"Empirical studies have failed to consider, at least conceptually, things such as: the transaction costs related to structural arrangements for managing knowledge transfer and controlling the negative consequences of unwanted leakage of knowledge to partners, opportunism and the role of bounded rationality; all of which have been theorised as possible influences on the relationship (Doz, 1996; Mora-Valentin, Montoro-Sanchez & Guerras-Martin, 2004)." (Torugsa et al., 2016)<br><br>"Another way to look at the decision to cooperate is as an equilibrium between achieving a high knowledge flow and protecting internal knowledge from leaking out (Schmidt, 2005)." (de Faria et al., 2010) |
|  |                                      | Knowledge transfer   |   | "During such IFC (Inter-Firm Collaboration), the exchange of relation-specific knowledge (assets) occurs most often via multiple exchanges over time between partner firms, rather than being a 'once-off' event; moreover, the series of transactions through which   |

|  |               |   |
|--|---------------|---|
|  |               | <p>a firm's exclusive knowledge becomes shared knowledge creates a state of dependency between the collaborating firms (Williamson, 1985)." (Torugsa et al., 2016)</p> <p>"In order to produce and successfully commercialise innovation, firms must synthesize a wide variety of expertise and knowledge produced by different complementary sources." (Muscio, 2007)</p> <p>"Likewise, Tranekjer and Knudsen found success factors for SMEs to include knowledge-sharing cultures, the sharing of collaboration experience, openness, and exchange collaboration." (Yoon et al., 2017)</p> <p>"In environmental collaboration, supply chain partners leverage each other's resources and exploit learning and knowledge sharing opportunities to enhance environmental sustainability." (Grekova et al., 2016)</p> <p>"Furthermore, environmental innovation especially requires engagement of external partners because they can provide new skills and knowledge." (Grekova et al., 2013)</p> |
|  | IT capability | <p>Integration through an information system (Sherer, 2003)</p> <p>"ICT facilities will help the creating of digital collaboration amongst members in Batik SMEs community. ICT facilities includes the Internet, computers, software, and any device which can handle for data sharing, transfer, send and receive. While connect virtually they will easily to discuss, negotiate and sharing knowledge or information so that the collaboration can take in the theme of borderless, real time and speed." (Fachrunnisa et al., 2012)</p>  |

*Table 8 Grounded theory table*

## 8.4 INTERVIEW

### 8.4.1 RESULTS OF THE INTERVIEWS

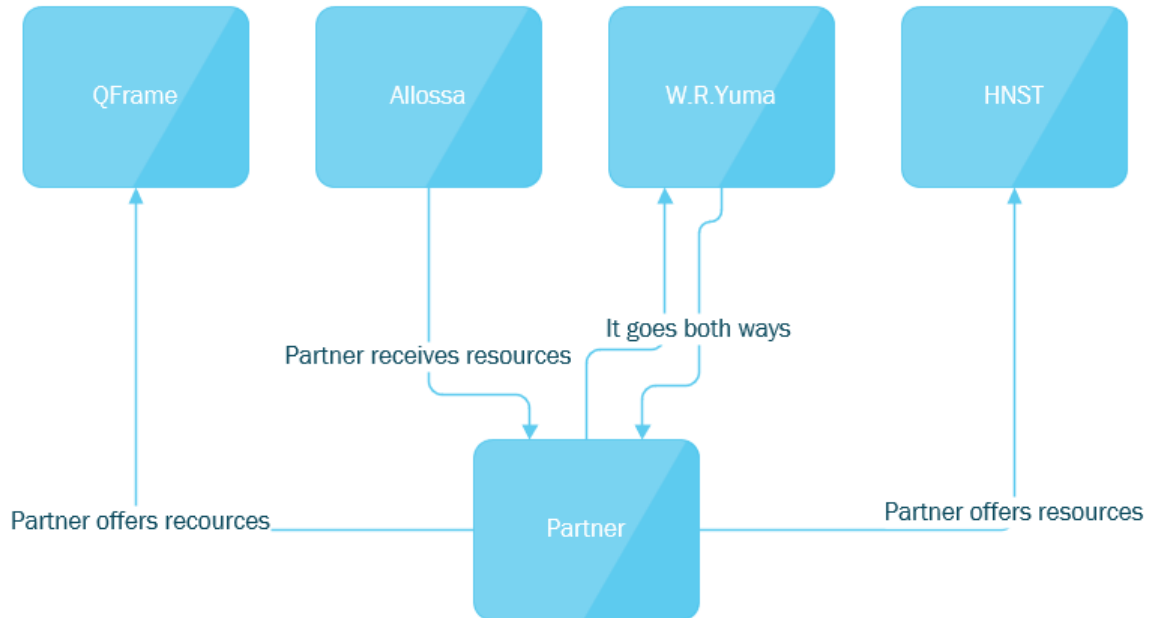


Figure 9 Resource relationship between interviewees and their partner – the partner can either offer or receive resources in exchange for financial resources

Legend:

- F = for the focal firm
- P = for the partner firm

|                               |                            | Interviewees |         |          |      |
|-------------------------------|----------------------------|--------------|---------|----------|------|
|                               |                            | QFrame       | Allossa | W.R.Yuma | HNST |
| <b>Kind of innovation</b>     | Process                    | F            |         | F        | F    |
|                               | Product                    |              | P       | F - P    | F    |
| <b>Kind of value creation</b> | Associational Value        |              |         | F - P    | F    |
|                               | Transferred resource Value | F            | P       | F - P    | F    |
|                               | Interaction Value          |              |         | F - P    | F    |
|                               | Synergistic Value          | F            | P       | F - P    | F    |

Table 9 Orienting the kind of innovation of the interviewees

Legend:

- Text in *italics* = new factors or factors that changed place within the table
- Tilde (~) = Multiple authors referenced this factor in the same quote, counts as individual quotation

| Category  | Dimension                                     | Code  | Interviewees |         |          |      | # of literature references |
|---|---|---|--------------|---------|----------|------|----------------------------|
|   |   |   | QFrame       | Allossa | W.R.Yuma | HNST |                            |
| Prerequisites of the focal firm / Focal firm's own resources and capabilities | Organizational culture                        | Working climate   | X            |         |          | X    | 1                          |
|   |   | Strategy formulation  | X            |         | X        | X    | 1                          |
|   |   | Interaction of organization with other stakeholders         | X            | X       |          | X    | 1                          |
|   |   | Mindset   | X            |         | X        | X    | 1                          |
|   |   | <i>Internal knowledge sharing</i>                           | X            |         |          |      | ~9                         |
|   | Absorptive capacity / Organisational learning | R&D   | X            | X       |          |      | 2                          |
|   |   | Skilled human capital                                       | X            | X       |          | X    | 2                          |
|   |   | HR  | X            |         |          | X    | 1                          |
|   | Management and leadership                     | Awareness of the employees                                  | X            |         | X        | X    | 2                          |
|   |   | Fight resistance  | X            |         |          |      | 1                          |
|   |   | Ecopreneurship  | X            | X       | X        | X    | 1                          |
|   |   | Collaborative capability / Relational capability            |              |         | X        | X    | ~13                        |
|   |   | <i>Ability and willingness to invest financially</i>        | X            |         |          | X    |                            |
|   |   | <i>Having a collaborative leader (also referred to as a</i> | X            |         | X        | X    | 4                          |

|  |   |  |   |   |   |   |     |
|--|---|--|---|---|---|---|-----|
|  | <i>Those internally responsible</i>           | <i>fairy godmother, a facilitator, entrepreneur...</i>   |   |   |   |   |     |
|  |   | <i>Project team</i>  | X |   |   |   |     |
| <b>Prerequisites of the partner firm</b> | Organizational culture                        | Working climate  |   |   |   |   | 1   |
|  |   | Strategy formulation   |   |   |   |   | 1   |
|  |   | Interaction of organization with other stakeholders  |   |   |   |   | 1   |
|  |   | Mindset  |   | X | X | X | 1   |
|  |   | <i>Internal knowledge sharing</i>  |   |   |   |   | ~9  |
|  | Absorptive capacity / Organisational learning | R&D  |   |   | X |   | 2   |
|  |   | Skilled human capital  |   |   | X |   | 2   |
|  |   | HR   |   |   |   |   | 1   |
|  | Management and leadership                     | Awareness of the employees   |   |   | X |   | 2   |
|  |   | Fight resistance   |   |   | X |   | 1   |
|  |   | Ecopreneurship   |   |   | X | X | 1   |
|  |   | Collaborative capability / Relational capability   | X | X | X | X | ~13 |
|  |   | <i>Ability and willingness to invest financially</i>   |   | X | X | X |     |
|  | <i>Those internally responsible</i>           | <i>Having a collaborative leader (also referred to as a fairy godmother, a facilitator, entrepreneur...)</i> | X | X | X | X | 4   |
|  |   | <i>Project team</i>  |   | X |   | X |     |



|                            |                   |   |   |   |   |   |     |
|----------------------------|-------------------|---|---|---|---|---|-----|
| Motivations and incentives | External pressure | Regulatory pressure and incentives                                  | X | X |   |   | 4   |
|                            |                   | Stakeholder pressure/<br>Social environmental awareness             |   | X |   |   | ~11 |
|                            |                   | Gap in market created through downsizing of another firm            |   |   |   |   | 1   |
|                            | Internal pressure | Environmental performance   | X |   | X | X | 2   |
|                            |                   | Internal processes  | X |   |   | X | ~4  |
|                            |                   | Reduce packaging, pollution, waste... or valorize the waste         |   | X | X | X | 2   |
|                            |                   | Cost reduction  |   |   |   |   | ~14 |
|                            |                   | Optimal resource utilization  |   | X | X | X | ~10 |
|                            |                   | Resource and capability gaps  | X | X | X | X | 3   |
|                            | Market gains      | Product price, turnover or product quality                          |   | X | X | X | ~6  |
|                            |                   | Maintaining and/or increasing firm image                            |   | X | X |   | 1   |
|                            |                   | Legitimacy creation of sustainability and its possible technologies | X |   | X |   | ~5  |
|                            |                   | Competitive advantage   |   | X |   |   | ~13 |
|                            |                   | <i>Reaching new customer segments</i>                               |   |   | X |   |     |
|                            | Innovation gains  | New product development   |   | X | X | X | 2   |

|  |  |  |   |   |   |   |     |
|--|--|--|---|---|---|---|-----|
|  |  | Knowledge and expertise  | X | X | X | X | ~10 |
| <b>Forms to collaborate in</b>                           | Forms of inter-firm collaboration by Zizlavsky & Estélyiová (2013) | Type of cooperation  |   |   |   |   |     |
|  |  | Outsourcing  | X | X | X | X |     |
|  |  | Contractor relations   |   |   | X | X |     |
|  |  | Licensing  |   |   |   |   |     |
|  |  | Spin-off companies   |   |   |   |   |     |
|  |  | Research consortium  |   |   |   |   |     |
|  |  | Strategic alliance   |   |   |   |   |     |
|  |  | Joint venture  |   |   |   |   |     |
|  | Innovation networks, clusters                                      |  |   |   |   |   |     |
| Appropriation strategy                                   | Formal methods   |  |   | X | X | 1 |     |
|  | Informal methods   |  |   | X | X | 1 |     |
| <b>Influencing factors on collaboration relationship</b> | Partner selection  | Complementary resources (both tangible and intangible) including knowledge | X | X | X | X | ~6  |
|  |  | Diversity  |   |   |   |   | 1   |

|  |                           |   |                                 |   |   |   |    |   |
|--|---------------------------|---|---------------------------------|---|---|---|----|---|
|  |                           | R&D ability   |                                 |   | X |   | ~4 |   |
|  |                           | Collaboration experience                                  | X                               | X |   |   | ~5 |   |
|  |                           | Control   |                                 | X |   |   | 1  |   |
|  |                           | Firm size   |                                 |   | X | X | ~5 |   |
|  |                           | Availability of partners                                  |                                 |   | X | X | 1  |   |
|  |                           | Geographical similarity                                   |                                 |   | X |   | 1  |   |
|  |                           | Scalability   |                                 |   | X | X | 1  |   |
|  |                           | <i>Complementary mindset and/or identity</i>              |                                 |   | X | X |    |   |
|  |                           | <i>Getting a partner recommended through someone else</i> | X                               |   | X |   |    |   |
|  | Defining the relationship |   | Setting of clear goals          |   | X | X | X  | 2 |
|  |                           |   | Role-setting                    |   | X |   | X  | 1 |
|  |                           |   | Performance measurement methods |   |   |   | X  | 3 |
|  |                           |   | Sharing of risks and benefits   |   | X | X |    | 2 |
|  |                           |   | Distribution of resources       |   | X | X | X  | 1 |

|  |                           |  |   |   |   |   |   |     |
|--|---------------------------|--|---|---|---|---|---|-----|
|  | Managing the relationship | Finding a collaborative leader (also referred to as a fairy godmother, a facilitator, entrepreneur...) |   |   |   |   |   |     |
|  |                           | Methods of solving common issues   |   |   |   |   | 1 |     |
|  |                           | Bringing together opposing values  |   | X |   |   |   | 3   |
|  |                           | Communication  | X | X | X | X |   | ~10 |
|  |                           | Mutual trust, openness, transparency   | X | X | X | X |   | 2   |
|  |                           | Interdependency  |   | X | X | X |   | 2   |
|  | Knowledge management      | Knowledge spillovers   |   |   |   |   |   | ~7  |
|  |                           | Knowledge transfer   | X | X |   |   |   | ~7  |
|  |                           | IT capability  |   |   |   |   |   | 2   |

*Table 10 Combination of the literature with the interviews . The italic texts are new or changed places in the table when compared to the original literature table (table 8). The tilde (~) next to a number means that the quotation(s) include(s) many other authors that talked about that factor, and these were counted as individual authors that refer to that factor. The text that has been ~~struck out~~ means that the factor was placed somewhere else in the table.*